



DR. JEAN-PAUL THEURILLAT (Orcid ID : 0000-0002-1843-5809)

DR. ANDRAŽ ČARNI (Orcid ID : 0000-0002-8909-4298)

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Milan Chytrý

International Code of Phytosociological Nomenclature. 4th edition

Jean-Paul Theurillat^{1,2} (<https://orcid.org/0000-0002-1843-5809>), Wolfgang Willner³(<https://orcid.org/0000-0003-1591-8386>), Federico Fernández-González⁴ (<https://orcid.org/0000-0003-1234-4065>), Helga Bültmann⁵(<https://orcid.org/0000-0002-1948-6376>), Andraž Čarni^{6,7,8} (<https://orcid.org/0000-0002-8909-4298>), Daniela Gigante⁹ (<https://orcid.org/0000-0003-1787-5164>), Ladislav Mucina^{10,11} (<https://orcid.org/0000-0003-0317-8886>), Heinrich Weber¹²

¹Fondation J.-M. Aubert, Case postale 71, 1938 Champex-Lac, Switzerland

²Department of Botany and Plant Biology, Section of Biology, University of Geneva, Case postale 71, 1292 Chambésy, Switzerland

³University of Vienna, Department of Botany and Biodiversity Research, Rennweg 14, 1030 Vienna, Austria

⁴Institute of Environmental Sciences, University of Castilla-La Mancha, 45071 Toledo, Spain

⁵Michaelweg 40, 48149 Münster, Germany

⁶Research Center of the Slovenian Academy of Sciences and Arts, Novi trg 2, 1000 Ljubljana, Slovenia

⁷University of Nova Gorica, Vipavska 13, 5000 Nova Gorica, Slovenia

⁸Academy of Sciences and Arts of the Republic of North Macedonia, Bul. Krste Misirkov, 2, 1000 Skopje, North Macedonia

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⁹Department of Agricultural, Food and Environmental Science, University of Perugia, Borgo XX giugno 74, 06121 Perugia, Italy

¹⁰Iluka Chair in Vegetation Science and Biogeography, Harry Butler Institute, Murdoch University, 90 South Street, Murdoch WA 6150, Perth, Australia

¹¹Department of Geography and Environmental Studies, Stellenbosch University, Private Bag X1, Matieland, Stellenbosch 7602, South Africa

¹²Am Bühner Bach 12, 49565 Bramsche, Germany

Correspondence

⁹Daniela Gigante, Department of Agricultural, Food and Environmental Science, University of Perugia, Borgo XX giugno 74, I-06121 Perugia, Italy

Email: daniela.gigante@unipg.it

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Abstract

The 4th edition of the International Code of Phytosociological Nomenclature (ICPN) was prepared by the Steering Committee of the IAVS Working Group for Phytosociological Nomenclature (GPN). The edition consists of 14 Definitions, 7 Principles, 53 Articles, and 7 Appendices. When compared with the previous edition, the main amendments are (1) the acceptance of electronic publications (Art. 1), (2) the introduction of binding decisions (Definition XIV, Principle II, Articles 1, 2b, 3c, 29b, 40, 42, 44, Appendices VI and VII), (3) the mandatory use of the English or the Latin terminology for syntaxonomic novelties (Definition II, Principle II, Articles 3d and 3i), (4) the introduction of autonyms for the main ranks when the corresponding secondary ranks are created (Articles 13b and 24), (5) the automatic correction of the taxon names (name-giving taxa) used in the names of syntaxa in accordance with the International Code of Nomenclature for algae, fungi, and plants (ICN) (Article 44), (6) the possibility to mutate the name of a syntaxon in using another correct, alternative name for the name-giving taxa (Article 45), (7) the

introduction of inadequate names, a new category of rejected names (Definition V, Articles 43 through 45), and (8) the introduction of a conserved type (Definition XIII, Article 53). The 4th edition of ICPN was approved by the GPN on 25 May 2019 and becomes effectively binding on 1 January 2021.

Keywords

Code, effective publication, phytosociological nomenclature, ICPN, name, nomenclatural type, phytosociology, syntaxonomy, type, vegetation classification

Introduction

In the search to understand Nature, we have an inherent need to name things and objects of (scientific) enquiry to convey intellectual abstractions and facilitate communication. Ideally, a given object should bear only one name, and a given name should convey only a single meaning. However, it often happens that objects have several names and that a name may convey different meanings. In science too, we need rules of naming objects to confront the nomenclatural chaos resulting from the inherent entropy of the human nature. Therefore, names are "powerful tools" (Mucina, 1997a). Scientific naming should follow simple and objective criteria in the form of rules that can be applied universally, especially in biological classification. Applying nomenclature rules to outcomes of a classification can be considered as the final step of that process (Izco, 2002). Efficiency in the application of objective criteria and rules is linked to precision, the need of which increases with an increasing amount of information or a greater individual freedom.

Although phytosociology, focusing on the recognition and description of plant communities, is a rather young biological discipline, it makes no exception regarding the naming of its objects. Objective principles and rules are needed to name the abstract types of plant communities, called syntaxa, which are defined by classification process (syntaxonomic process) (De Cáceres et al., 2015), aiming at assisting communication and achieving stability in naming of plant communities. The first attempts to formulate an International Code of Phytosociological Nomenclature (ICPN) go back to the botanical congress of Stockholm in 1950 (Barkman, 1953a, 1953b; Meijer Drees, 1953). However,

it took more than 20 years for such a Code to see the light of the day (Barkman, Moravec & Rauschert, 1976). Second and third editions followed in 1986 and 2000, respectively (Barkman, Moravec & Rauschert, 1986; Weber, Moravec & Theurillat, 2000). All three editions were prepared by the Nomenclature Commission of the International Association for Vegetation Science (IAVS). In 2013, the Nomenclature Commission was officially replaced by the Working Group of Phytosociological Nomenclature (GPN) whose task was to maintain, improve, and properly apply the ICPN (see http://iavs.org/getattachment/Working-Groups/Group-for-Phytosociological-Nomenclature/GPN-Bylaws_20130915.pdf.aspx?lang=en-US).

Since its election in 2014, the first Steering Committee of the GPN (re-elected in 2018), joined by Heinrich Weber, the lead author of the 3rd edition of the ICPN, worked on preparation of the present, 4th edition of the Code. The major issues brought up since the publication of the 3rd edition were identified, among those the problems with application of the ICPN, developments of electronic publishing, and coupling with the Botanical Code and the progress in molecular taxonomy, the two latter relevant for changing the names of syntaxa. A compilation of proposals with examples was put together to provide a basis for discussions aimed at revising the 3rd edition of the ICPN. During four meetings of the Steering Committee (SC), three in Rome (18–20 February 2015, 4–6 November 2015, 5–9 April 2016) and one in Vienna (28–31 October 2016), a review of every single article of the 3rd edition of ICPN was undertaken. The discussions within the SC between the meetings continued by email. The first draft of the new edition was submitted to GPN for feedback in December 2017. By taking into account the proposals received from several GPN members, the original draft was re-elaborated and fine-tuned in 2018. A new a version was submitted to the membership of GPN for approval by vote on 25 April 2019 during a one-month period, in accordance with the GPN bylaws. The version was approved on 25 May 2019 by a thirty-to-three decision (91% positive answers) delivered by 33 members (of a total of 66 GPN members) who participated in the ballot. Following the approval, adjustments, rewording and edits for coherency and clarity were performed, leading to the final version presented here. The resulting Code consists of 14 Definitions, 7 Principles, 53 Articles, and 7 Appendices. *Definitions* clarify the meaning of certain fundamental concepts and terms used in the Code. *Principles* set the basis for the phytosociological nomenclature. *Articles* provide the

binding rules of nomenclature, some including also non-binding *Recommendations*. Most of the Articles are completed by *Examples* aimed to illustrate the application of the rules. Where needed, explanatory *Notes* have been provided to assist Definitions, Principles, and Articles. *Appendices* convey complementary information pertinent to the application of the Code.

In comparison with the 3rd edition (Weber et al., 2000), nearly all Definitions, Principles, and Articles have been reworded and many Articles were reorganised. Numerous new Examples, Notes, and Recommendations were added to help understanding the Articles, as well as many cross-references between Articles to facilitate an integrated application of the Code. In addition, several nomenclatural novelties were introduced. Article 35 has been repealed and, as a result of the changes and the new rules introduced, the former Articles 18c, 19b, 28b, 29a, and 41d were deemed no longer needed, as the issues they used to address are now part of the articles 25, 24b, 27c, 29c and 12, respectively. Nevertheless, the numbering of the previous edition has been maintained. Therefore, where needed to follow the numerical order, the position of these articles is maintained with the indication "deleted". The 4th edition of the ICPN becomes effectively binding on 1 January 2021.

Novelties and changes

Hereafter, the main novelties and changes introduced in the 4th edition of the Code are presented and discussed following their sequence in the Code.

Syntaxon (Definition I)

Definition I pertains to syntaxa, being abstract units defined by floristic-sociological criteria based on phytocoenoses, along with abstract vegetation types occupying particular habitats delimited at fine spatial scales supporting 'cryptogamic' communities (e.g. 'microcoenoses', 'synusia', 'societies'). Recently, a proposal has been issued to limit syntaxa to communities formed by macroscopic individuals within a plot, that is vascular plants, bryophytes, lichens, charophytes, and "macrophytic" chlorophytes, rhodophytes and phaeophytes, because the sampling methods for microorganisms, including fungi, are too different to produce comparable results with macroorganisms (Berg, Ewald, Berg

& Hobohm, 2018). Without an intention of entering into the debate, we point out that the required quantification of the taxa in a relevé can occur also in the form of frequency (see Article 7, Note 1). Therefore, provided that the Operational Taxonomic Units (OTUs) of microorganisms retrieved by molecular analyses in a sample plot (e.g. soil crusts) can be assessed by their frequency, communities of microorganisms can be described and named when an author wishes to do so, insofar OTUs are identified and correctly named in accordance with the International Code of Nomenclature for algae, fungi, and plants (ICN; Turland et al. 2018) (see Articles 2c and 3l).

Inadequate names (Definition V, Recommendation 31A)

Inadequate names (*nomina inepta*) form a new category of illegitimate names resulting from corrections according to Articles 43 through 45. They are validly published names of syntaxa that cannot be used anymore since they are formed using incorrect taxon names. For instance, the name '*Quercion pubescenti-sessiliflorae* Braun-Blanquet 1932' was formed using *Quercus sessiliflora* Salisb. 1796, an illegitimate synonym of *Q. petraea* (Matt.) Liebl. 1784. Therefore, in accordance with the new Article 44, the name '*Quercion pubescenti-sessiliflorae* Braun-Blanquet 1932' must be corrected to '*Quercion pubescenti-petraeae* Braun-Blanquet 1932 *nom. corr.*' The original name of Braun-Blanquet becomes an inadequate name (*nomen ineptum*) to be cited '*Quercion pubescenti-sessiliflorae* Braun-Blanquet 1932 *nom. inept.*' (Article 44, Example 3). Similarly, the name of a syntaxon that has been formed by using a wrongly identified name-giving taxon that would not occur in the relevés of the original diagnosis, is an inadequate name that must be corrected (Article 43). Another source of inadequate names may be seen in mutations of syntaxon names with incorrect name-giving taxa (Article 45).

Conserved type (Definition XIII, Article 53)

The conservation of names was introduced in the 3rd edition of ICPN (Weber et al., 2000; Article 52) to avoid the rejection of commonly used, validly published names due to a strict application of the rules that might upset nomenclatural stability. However, it may also happen that the original diagnosis of a syntaxon name would contain only elements poorly reflecting the current concept of the name. Likewise, it can occur that the type of a

name no more reflects the current application of that name. In such cases, strict application of the rules would lead to rejection of the name in accordance with Article 36 (*nomen ambiguum*). To avoid such situations involving commonly used names, it is now possible, under the new Article 53, to preserve a name in conserving it with a conserved type, that is an element other than the one designated by the author or determined by the application of the rules and well representing the current application of the name.

Binding decision (Definition XIV, Principle II, Articles 1, 2b, 3c, 29b, 40, 42, and 44, Appendices VI and VII)

The need for introducing tools of formal decision on cases involving subjective judgement on a name often used in a sense that excludes its type (*nomen ambiguum*, Article 36) was recognised since the 1st edition of ICPN (see also Krahulec, 1997). However, there are other controversial and subjective cases, and singular cases not properly ruled by ICPN, as well as doubtful cases for which a straightforward interpretation of the rules is debatable (Principle II, Articles 1, 2b, 3c, 29b, 40, 42, and 44). Thus, it is now possible to submit a request for a decision on a particular case to the Committee for Change and Conservation of names (CCCN). Such a decision would become binding (Definition XIV, Principle II) once it is ratified by the Assembly of GPN (Definition XIV). Binding decisions can be requested when addressing the following cases:

- a) valid publication of 'association names' of the Uppsala School published before 1 January 1936 (Principle II);
- b) effectivity of a publication (Article 1);
- c) sufficient, original diagnosis (Article 2b);
- d) qualification of some abstract units as syntaxa, in accordance to Definition I (Article 3c);
- e) correct determination of the dominant strata (Article 29b);
- f) selection of the name-giving taxa for names of syntaxa published before 1 January 1979 (Article 40b);
- g) inversion of names (Article 42); and
- h) correct name of a name-giving taxon (Article 44).

The guidelines on how to request for a binding decision are provided in the new Appendix VI. The new Appendix VII is prepared to list the decisions approved by the Assembly of

GPN. As approved, the decisions will be published on the GPN website (<http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Appendices.aspx>).

Prefixes modifying a principal rank (Principle II, Article 3d)

Until now there was no rule on prefixes intended to modify the spatial extension of a principal rank, such as the German prefixes 'Haupt-', 'Regional-', 'Provinzial-' or 'Klein-'. These prefixes, often used to designate subordinated units, are accepted at the given principal rank (e.g. 'Hauptassoziation' is retained as an association) within the limits of Article 3d.

Effective publication (Article 1)

Following the important development in the field of scientific publishing within the past ten years, the long-awaited acceptance of electronic publications as nomenclaturally effective has been now embraced by 4th edition of the Code. An electronic publication will be accepted as effective on or after 1 January 2021 only in the form of Portable Document Format (PDF) that would bear either an International Standard Book Number (ISBN, introduced in 1970) or an International Standard Serial Number (ISSN, introduced in 1975) or a Digital Object Identifier (DOI, introduced in 2000). However, the nomenclatural effectivity of the additional content to an electronic publication, for instance the so-called "supplementary material" or "online resource", or "supporting information" or "extended data", will be limited to the material as detailed in Article 1, and for which the publisher is explicitly responsible, in order to guarantee the perennity of such material.

Moreover, the publications that were not 'printed' in the sense of the Article 1 (e.g. xerography, inkjet) are retroactively accepted as valid if they bear either an ISSN or an ISBN.

English or Latin terminology (Articles 3d, 3i, 3o and 5)

Latin terminology became mandatory in the 3rd edition of ICPN (Weber et al., 2000) to designate the type of the name of a syntaxon (*typus*, *lectotypus*, *neotypus*) (Articles 3o and 5). The mandatory use of the Latin terminology is now extended to designate the principal ranks and their associated secondary ranks (Definition II, Article 3d), as well as

in every case of a novelty (Definition XIII, Article 3i). However, since not every person is acquainted with the Latin terminology, the English terminology is also accepted to designate ranks and novelties. Therefore, although the terminologies in some languages may be very close to the English terminology, they are no more accepted. For instance, the words 'associazione' (Italian) or 'alianza' (Spanish) or 'orden' (Spanish) or 'classe' (French, Italian) are no more accepted to designate an association, an alliance, an order, and a class, respectively. The correct Latin and English terminology of the four recognised principal ranks and their associated secondary ranks is given in Definition II, and the correct terminologies for the novelties in Article 3i.

To be consistent with the rule introduced in the 3rd edition of ICPN to designate the type of a syntaxon (Articles 3o and 5), only the Latin terminology is authorised, the mandatory word '*typus*' (*holotypus*, *lectotypus*, *neotypus*) having the function of a universal tag to retrieve that element in whatever language used in a publication.

Autonyms (Articles 4d, 4e, 5b, 13b and 24b)

Autonyms are names of syntaxa of secondary rank containing the type of the name of a syntaxon of principal rank. They are established automatically when such a syntaxon of principal rank is divided in secondary ranks for the first time (Definition XI). Autonyms are not followed by the author citation. At the association rank the autonym is the subassociation *typicum* (Article 13b). Above the association rank, the name of the autonym is formed by the addition of the prefix *Eu-* (hyphen included) to the name at the principal rank and altering the rank-indicating termination (Article 24b).

The rule on autonyms has been applied for a long time in botany and zoology. In phytosociology, the automatic creation of the secondary rank containing the type of the principal rank by altering only the rank-indicating termination of the name at the principal rank was not fully considered a necessity. Introduced on or after 1 January 1979 in the 1st (Barkman et al., 1976) and the 2nd edition (Barkman et al., 1986) for ranks higher than association, the automatic creation was even abandoned in the 3rd edition (Weber et al, 2000). In the latter edition, the author citation was requested for the autonym to identify it when it would be considered in isolation (see Article 24b, Note 1 in the present edition). At the association rank, the first step towards autonyms was made in the 3rd edition with the request that the type of the subassociation *typicum* must be the type of

the association name on or after 1 January 2002. However, the previous editions of the Code did not attempt to rule autonyms prior to 1 January 1979. The standard and retroactive implementation of autonyms on or after 1 January 2021 throughout all ranks (Definition XI, Articles 13b and 24b) will provide the great advantage to recognise immediately the secondary rank that contains the name-bearing type of the principal rank. The new rule will considerably reduce the time-consuming search for the oldest legitimate name at secondary ranks.

A consequence of the implementation of the autonym rule is that all the subassociations *typicum* not containing the type of the association, a situation that was possible before 1 January 2002, are retroactively invalidly published (Articles 4d and 5b). Another consequence is that a subassociation containing the type of the association but not named '*typicum*' becomes automatically the autonym '*typicum*' (Article 5b). On or after 1 January 2021, such a solution is no more allowed (Articles 4e and 13b). Moreover, Article 28b introduced in the 3rd edition of ICPN to rule the reduction of an association to the rank of a subassociation belongs now to Article 27c, and hence has been cancelled.

'Better names' (Article 29a)

Article 29a from the 3rd edition of ICPN (Weber et al., 2000) is cancelled in the 4th edition since 'better names' are only special cases of superfluous names (Article 29c), for example the name '*Sempervivo-Sedetalia*' published by Müller (1961) to replace the name *Sedo-Scleranthetalia* Braun-Blanquet 1955 because the combination of the two name-giving taxa *Sedum* and *Scleranthus* was deemed not informative. However, a change of the name-giving taxa to follow another taxonomic concept remains acceptable since the resulting alternative syntaxon name is not a superfluous name but a mutation of that name (see Article 45).

Double names (Article 35)

Article 35 from the previous editions of ICPN is cancelled in the 4th edition since the cases such as the '*Molinio-Arrhenatheretea* Tüxen 1937', given as an example, are very rare and, sometimes, also difficult to ascertain. Therefore, these cases would be better solved by a binding decision as particular cases pertaining to the Article 40b.

Correction of names (Article 44)

In the preceding editions of ICPN (Article 30), the scientific names of organisms chosen by the author(s) as the name-giving taxa of the syntaxon name had to be accepted for the sake of stability of the syntaxon names, except for the name of the taxon that was deemed a later homonym. Now, the names of the name-giving taxa must automatically be corrected if they do not meet the provisions of the ICN, be it for the sake of priority, illegitimacy, misapplication or rejection of taxon names. Therefore, the correct taxon name must always be used (Article 44).

The automatic correction of the name-giving taxa of a syntaxon name to follow the rules of the ICN is an important decision. Since flora accounts are being regularly updated nomenclaturally, several names of syntaxa are now at odds with the correct names of taxa in current use. In the previous editions of ICPN, a correction according to Article 44 became automatically necessary only when a name-giving taxon was a later homonym. Otherwise, the name-giving taxa had to be accepted if they were validly published, even if they were illegitimate or if they were later synonyms (Weber et al., 2000; Article 30). In such cases, a change was possible upon approval by the former Nomenclatural Commission, yet only if the names of taxa were no more in use in the most important taxonomic and floristic literature of the last twenty years (Weber et al., 2000; Article 45). Now, the correct taxon name must be used, whatever the reason of the nomenclatural incorrectness of the original name-giving taxon, and all such cases are ruled by the Article 44. However, the correct name can be only a name of the same circumscription and at the same position and rank; otherwise it is not a nomenclatural correction but a mutation (see Article 45). Caution is requested in correcting name-giving taxa, and authors are recommended to check that a correction is in accordance with ICN to avoid publishing unnecessary *nomina inepta*.

Mutation of names (Article 45)

In the previous editions of the ICPN, the taxonomic choice of the author(s) of the syntaxon name for the name-giving taxa had to be accepted. Changing the name-giving taxa used to form the name of a syntaxon upon taxonomic reasons was possible only for the names of taxa that were no longer found in the taxonomic and floristic literature of the past 20 years, yet upon a proposal to be duly accepted by the Nomenclature

Commission. Nevertheless, authors were performing illegitimate mutations of names of syntaxa without complying with the request stipulated by the former Article 45 asking for submission of a formal proposal for change to the former Nomenclature Commission (Barkman et al., 1976, 1986). This lack of compliance led to a precarious situation resulting in the publication of more and more illegitimate mutations of the syntaxon names. To avoid the growing number of illegitimate mutations, the first pragmatic step was taken in the 3rd edition in allowing the use of provisional proposals of changes (*nomina mutata proposita*) until the Nomenclature Commission would decide on formal proposals to be sent to it (Weber et al., 2000; Article 45). The concept of *nomina mutata proposita* has been fondly followed by many authors, but it did not solve the root of the problem. Indeed, only a handful of formal proposals to mutate a syntaxon name have ever been submitted to the former Nomenclature Commission after 2000, the year of the publication of the 3rd edition (see Willner, Grabherr, Pallas & Weber, 2011).

Acknowledging the situation and the compelling need for authors to adapt the name-giving taxa to the names and the taxonomic concepts in current use, the present edition opens an opportunity to mutate a syntaxon name by using correct, alternative names of the name-giving taxa (i.e. those names of a taxon linked to a different circumscription, position or rank). The mutated syntaxon names, that would provide alternative forms of the syntaxon name, must be explicitly published as such in accordance with Article 3i. The author(s) and the year of the effective publication of the mutation are to be placed after the original author citation, and they are to be preceded by the expression '*mut.*' (*'mutavit'*) appended to the author citation (see Article 45, Examples 1, 2, 4 and 5). Thus, a greater freedom is now offered to the authors who are free to use alternative taxonomic concepts within the limits as defined by the Article 45. This, however, comes with the cost of an increasing number of validly published names that will take priority towards possible later names for new syntaxa. The mutations proposed before 1 January 2021 (*'nomina mutata proposita'*) are not automatically accepted and must be published anew in accordance to Article 45.

In the 3rd edition (Weber et al., 2000), replacing an aggregate species by a narrower conceived species was allowed under the former Article 43 as 'corrections' as long as it was demonstrated that only the 'narrow-concept' taxon was indeed occurring in the relevés of the original diagnosis. However, such changes are mutations since there is

no obligation to use the 'narrow-concept' taxa to coin a name of a syntaxon (see Article 10a, Note 2). Since these corrections were deemed valid, they are considered now as valid mutations if they meet all requested conditions (see Article 45, Examples 4 through 6).

Other changes

Besides the points discussed above, the related articles to the following issues have been further specified, extended or modified:

- a) unambiguous reference (Article 2b);
- b) citation as a synonym (Article 3a);
- c) names published as 'manuscript' or 'unpublished' (Article 3b);
- d) the presence of the name-giving taxa in the original diagnosis of new syntaxa above the association rank (Articles 3f and 17);
- e) the validity of autonyms based on names of principal rank higher than the association that were published before 1 January 1979, and containing a prefix expressing a morphological or an ecological characteristic (Article 3h);
- f) the definition of the 'dominant stratum' (Articles 3k and 29b);
- g) the use of an aggregate as a name-giving taxon (Article 3l);
- h) the invalidity of names formed from more than two name-giving taxa for an association and the higher ranks, or more than one name-giving taxon for a subassociation (Articles 3p and 34c);
- i) invalid corrections and mutations (Article 3q);
- j) the need of names of secondary rank to be subordinated to a validly published principal rank to be deemed validly published (Article 4a);
- k) the validity of the subassociation '*typicum*' and that of the 'typical' subassociation, as well as the illegitimacy or invalid publication of the epithet '*normale*' for a subassociation (Articles 4c, 4d, 4e, 13a, 14a and 34a);
- l) the acceptance of the asterisk (*) to designate the type relevé before 1 January 2002 (Article 5a);
- m) the mandatory designation of the type using the word *typus* also when there is only a single, suitable element available for the latter (Articles 5a and 18a);

- n) the type of an association published before 1 January 2002 and containing a subassociation *typicum* (Article 5b);
 - o) the later validation of an invalid name (Article 6);
 - p) the original diagnosis containing three presence-absence relevés (Article 7);
 - q) the use of infraspecific epithets as name-giving taxa (Article 10a);
 - r) the order of two name-giving taxa belonging both to the dominant stratum (Article 10b);
 - s) the correct designation of the holotype, the lectotype, and the neotype (Articles 18a, 19a, 19c and 21);
 - t) the use of alternative names (Definition VI, Articles 22 and 30);
 - u) the restriction of the priority of subassociation epithets to a given position (Article 26);
 - v) the homonymy due to the automatic correction of the name-giving taxa (Article 31);
 - w) the mutation performed with a homotypic taxon name (Articles 31 and 32b);
 - x) the rejection of a *nomen ambiguum* (Article 36) and of a *nomen dubium* (Article 37);
 - y) unclear name-giving taxa for names published before 1 January 1979 (Article 40b);
- and
- z) the inversion of names (Article 42).

Appendices

The Guide to the correct formation of names of syntaxa (Appendix I) was revised and extended. The information about the conservation of names in Appendix II fully replaces the previous guidelines given in the 3rd edition (Weber et al., 2000), and those published by Willner, Theurillat, Čarni, Pallas & Weber (2015). The Appendices III (*nomina ambigua*), IV (*nomina inversa*), and V (*nomina conservanda*) have been replaced. In the present 4th edition, Appendix II contains the "Guidelines for proposals to conserve or reject a syntaxon name". Appendix III will list the conserved names and the names with a conserved type; Appendix IV and the new Appendix V will list the *nomina ambigua*, and the *nomina dubia*, respectively. The new Appendices VI and VII contain the guidelines to request a binding decision, and the list of those binding decisions, respectively. Once proposals for new *nomina ambigua* (Article 36), *nomina dubia* (Article 37), *nomina conservanda* (Article 52), conserved types (Article 53), and binding decisions will be approved by the GPN assembly, they will be published in the journal "Vegetation Classification and Survey" (<https://vcs.pensoft.net/>) and on the GPN website

(<http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Appendices.aspx>) before being included in their respective Appendices in the next edition of ICPN.

Registration of names of syntaxa

Regarding the registration of names of syntaxa, for which guidelines were also provided in the Appendix II of the 3rd edition, authors are now invited (Recommendation 1C) to register new names, as well as lectotypifications and neotypifications in the online database PhytoS after their publication (see <http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/PhytoS.aspx>). The beta version of PhytoS is currently under development to accommodate this task.

Amendments

Amendments of the Code and the preparation of new editions fall within the responsibility of the Steering Committee (SC) of the Working Group for Phytosociological Nomenclature (GPN) of the International Association for Vegetation Science (IAVS). All proposals on the Code have to be sent to the Secretary of GPN (see <http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Amendments.aspx>). The SC amendments, when ratified by the Assembly of the GPN, will be published in a new edition of the Code.

The first edition of ICPN (Barkman et al., 1976) laid the foundation for the basic rules and principles. The 2nd edition (Barkman et al., 1986) improved essentially on the first edition by providing more detail in formulations of articles and by providing more examples. In the 3rd edition (Weber et al., 2000) the conservation of names (Definition XIII, Article 52) was implemented and more precision was requested in the publication of new names (Articles 3i through 3o). Twenty years after, the present 4th edition implements new nomenclatural tools such as the long-awaited acceptance of the electronic publishing, the standardisation of the autonoms, the alignment of the name-giving taxa with the "International Code of Nomenclature for fungi, algae, and plants" (Turland et al., 2018), the possibility to apply a conserved type, and the introduction of binding decisions. Structural changes in several articles, more detailed explanations and new examples

have been brought in the view of making ICPN more usable to phytosociologists. Precision and authority of ICPN on the one hand, and simplicity and individual freedom on the other hand are issues that have been recurrently debated in the past, for instance during the preparation of the 3rd edition (Krahulec, 1997; Mucina 1997a, 1997b; Rejmánek, 1997; Sánchez Mata, 1997; Theurillat 1997). The authors of the present 4th edition hope to offer some solution in making ICPN more precise and more user-friendly, leaving less space to personal appreciation and, at the same time, allowing more freedom for an effective publication and in the naming of syntaxa.

DIVISION I. Definitions

Definition I – Syntaxa

The term *syntaxon* (plural: *syntaxa*) relates to an abstract unit with or without rank based on phytocoenoses and defined by floristic-sociological criteria. These abstract units may be incorporated into a hierarchical system.

Abstract units of communities of epiphytes (cryptogams or vascular plants) or particular habitats delimited at fine spatial scales supporting bryophyte, lichen or other 'cryptogamic' communities (e.g. 'microcoenoses', 'synusia', 'societies') are also considered as syntaxa when they are defined by floristic-sociological criteria.

The structural, functional or temporal subsets of phytocoenoses do not qualify as elements of description of syntaxa (e.g. one given layer of a multi-layered phytocoenosis; the parasitic species within a phytocoenosis; the geophytes covering the forest floor during the vernal aspect in temperate regions).

Note 1: Syntaxa include vegetation units of the Braun-Blanquet Approach, also known as Zürich-Montpellier School (except for 'circle of vegetation'), the vegetation units of the Uppsala School (except for 'panformation'), abstract units without rank such as 'community', 'community type', 'vegetation type', 'vegetation group', 'Gesellschaft', 'peuplement', 'groupement', 'nodum', 'coenon', etc. when they are derived on basis of phytocoenoses and coined using floristic-sociological criteria.

The symphytocoenological units are composites based on plant communities ('vegetation complex', 'sigmassociation', 'geosigmassociation', etc.) and they are not considered as syntaxa. The same holds for abstract phytocoenotic units derived from the integration of abstract synusial units ('coenassociations').

We refer to Braun-Blanquet (1932a, 1964), Westhoff & van der Maarel (1980) and Guarino, Willner, Pignatti, Attore & Loidi (2018) as the major references on the theory and methodology of the Braun-Blanquet Approach; to Du Rietz (1921, 1930), Barkman (1980) and Trass & Malmer (1980) on the Uppsala School; to Gams (1918) and Barkman (1980) on theory of synusia; to Lippmaa (1939) and Barkman (1980) on one-layered units of the Lippmaa School; to Theurillat (1992a, b) and Rivas-Martínez (2005) on symphytocoenology; and to Gillet, Foucault & Julve (1991) and Gillet & Julve (2018) on phytocoenotic integration of synusial units.

Note 2: Floristic-sociological criteria involve focus on complete floristic inventory of species, often associated with indication of relative importance based on projected cover or specimen counts in spatially delimited vegetation sampling plots called relevés, or frequency and/or constancy across a set of relevés. These data elements are subject of classification and lead to formulation of abstract floristic-based vegetation units characterised by species (character species, differential species) and/or species groups bearing delimitation power.

Note 3: Phytocoenosis (Engl. 'stand'; Germ. 'Bestand') is a piece of vegetation cover shared by organisms traditionally classified as vascular plants, bryophytes, algae, fungi, and bacteria. Phytocoenosis is part of biotic community (biocenosis) occupying a habitat at various scales of spatial complexity.

Definition II – Ranks of syntaxa

Ranks are the relative position of the nested categories of syntaxa recognised in the hierarchical system governed by this Code. There are four principal taxonomic ranks (from the lowest to the highest): Association (*associatio*), Alliance (*alliancia*), Order (*ordo*), Class (*classis*), and their four corresponding secondary ranks: Subassociation (*subassociatio*), Suballiance (*suballiancia*), Suborder (*subordo*), and Subclass (*subclassis*) (see also Principle II).

Note 1: The association is defined according to the proposal of Flahault and Schröter that was accepted at the Botanical Congress at Brussels in 1910 (De Wildeman, 1910, pp. 121, 152, 160) as follows: "An association (type of stands) is a plant community of definite floristic composition, presenting a uniform physiognomy, and growing in uniform habitat conditions".

A "stand" corresponds to a patch of vegetation of a plant community found in nature (see Def. I, Note 3).

Note 2: The terms '*associatio*' ('*subassociatio*') and '*alliancia*' ('*suballiancia*') are not true Latin terms. They are accepted constructs based on terms such as 'association' and 'alliance' and similar words in Romanic languages meaning 'joined' and 'union', respectively.

Note 3: Formerly, the alliance was also called '*foederatio*' and the suballiance was called '*subfoederatio*'. For cryptogamic syntaxa the terms '*classicula*', '*ordulus*', '*federatio*' and '*union*' have been used; these correspond to class, order, alliance and association, respectively (see also Art. 3d).

Definition III – Effective publication

An effective publication is a publication that is in accordance with the conditions of Art. 1. Not effectively published names will be treated as 'not published names' according to this Code.

Definition IV – Valid publication

A name is validly published if it meets the conditions stipulated by Arts. 2 through 9. Names not validly published have no effect on validly published names.

Definition V – Legitimacy of names

Legitimate names or epithets are those that are validly published and whose form meets the requirements stipulated by Art. 10a sentence 1, Art. 12, Art. 13a and that are not rejected according to Arts. 29b and 29c, Arts. 31 through 34, Arts. 36 through 38, Arts. 43 through 45, and Art. 52.

Illegitimate names or epithets are those that are validly published, but do not fit the prescriptions of Arts. 29b and 29c or Arts. 31 through 34 or Arts. 43 through 45 or those that have been rejected according to Arts. 36 through 38, and Art. 52 (*nomina rejicienda*; see Appendices IV and V).

Superfluous names or epithets (*nomina superflua*) are those rejected names in accordance with Art. 29c. A superfluous name is not superfluous when the earlier name is later proved to be illegitimate.

Inadequate names (*nomina inepta*) are rejected names formed with incorrect taxon names (Arts. 43 through 45). They are illegitimate and cannot be used unless the names of the incorrect name-giving taxa would become conserved or restored later as the correct name (Arts. 44 and 45).

Definition VI – Correct name

The correct name of a syntaxon is the earliest validly published name that is in accordance with the rules (see Art. 22). It is the legitimate name that must be adopted for this syntaxon having a particular circumscription, position and rank under the rules. The original form of the legitimate name must be corrected if it is inadmissible according to Arts. 41 through 44.

Note 1: The term 'original form of name' or 'original name' refers to the name used in its first valid publication.

Note 2: The term 'alternative name' refers to a name that is given in the original diagnosis as another choice for naming a syntaxon (see Arts. 3j and 30).

Note 3: The term 'alternative form of the name' refers to the name of a syntaxon whose name-giving taxon (taxa) has (have) been changed with the correct name(s) of the taxon (taxa) at a different taxonomic concept than the one followed in the original form of the name (see Art. 45). The 'alternative form of the name' is considered the same name as the correct name of the syntaxon (see also Principle III).

Note 4: The circumscription is the delimitation of a given syntaxon by the inclusion or exclusion of a set of elements, among which the type of the syntaxon name. Two syntaxa are the same when the types of their names are considered to belong to the same syntaxon. On the opposite, they are different when the types of their names are mutually considered to not belong to the content of the other syntaxon (see also Def. X).

The position relates to the inclusion of a given syntaxon of secondary rank in a syntaxon of the next principal rank. The transfer into another syntaxon of the next principal rank determines a different position of the syntaxon of secondary rank.

Definition VII – Nomenclatural combination

The term 'combination' refers to the name of a subassociation. It consists of the name of an association followed by the subassociation epithet (see Art. 13).

Definition VIII – Nomenclatural type

A nomenclatural type (a type of the name of a syntaxon) is that element of the syntaxon to which the name of the syntaxon remains permanently attached. The nomenclatural type needs not be the most typical element, for instance being considered characteristic or one that is outstanding owing to frequency of occurrence (see Art. 15).

An 'element', according to this Code, is a vegetation relevé in the case of associations and subassociations, and a syntaxon of the next subordinate principal rank in syntaxa of a higher rank.

The holotype is the element that is indicated as the nomenclatural type in the original diagnosis or that is the only element published or cited there.

The lectotype is a nomenclatural type that is chosen from several elements published and/or cited in the original diagnosis when none of those elements was indicated as the holotype.

The neotype is an element that is chosen as the nomenclatural type when neither the holotype nor an element suitable to be chosen as the lectotype occurs in the original diagnosis. The neotype applies only to associations and subassociations. It can only be a relevé that has been effectively published at the time of the designation of the neotype, or that is simultaneously published.

The conserved type is an element that is chosen as the nomenclatural type instead of the holotype, or one of the available elements to be chosen as the lectotype, in order that the meaning of a name is anchored in the way it is currently used (see Art. 53).

Note 1: Occasionally, the terms '*syntypus*', '*holosyntypus*', '*synholotypus*', '*lectosyntypus*', and '*neosyntypus*' were used. These terms are not recognized by this Code and, therefore, must be replaced by the corresponding terms '*typus*', '*holotypus*', '*lectotypus*', and '*neotypus*'.

Note 2: The original diagnosis of a name is the first description that contains the necessary elements for the name to be validly published (see Art. 2b).

Definition IX – Homonyms

Homonyms are validly published names based on different nomenclatural types and spelt out identically (see Art. 31). Names based on different nomenclatural types are also treated as homonyms if they are orthographic variants, or if they differ in the order of the names of the taxa, or if one is formed only with the specific epithet of the name of the taxon and the other one is formed with the binomial name of the taxon, and also if they are not spelt out identically, but are nevertheless formed using the same name-giving taxon (taxa), either as nomenclatural synonyms or at another rank (see Art. 32).

Definition X – Synonyms

Synonyms are legitimate or illegitimate names of the same rank, without regard to their position, that are considered as the same syntaxon.

Nomenclatural or homotypic synonyms are based on the same nomenclatural type and are therefore always synonyms.

Syntaxonomic or heterotypic synonyms are based on different nomenclatural types but they are considered to belong to the same syntaxon. With a changed circumscription of the syntaxon, they can become non-synonymous.

Pseudonyms are misapplied names, that is they are names used with the original author citation (see Def. XII) but misinterpreted by later authors (see Art. 39c and Rec. 46J).

Note 1: Names of syntaxa of different rank that have the same syntaxonomic content are not synonyms. These names, as well as pseudonyms, should be mentioned within the synonymy as 'corresponding names'.

Definition XI – Basionyms and autonyms

The basionym is the previously validly published name on which a new rank is based in

case of change in rank between principal and secondary ranks or vice-versa (see Art. 27). For subassociations, the basionym is also the previously published epithet-giving synonym in cases where a subassociation epithet is retained in a new combination with another association name (see Art. 26).

Autonyms are names of secondary rank containing the type of a name of principal rank that are established automatically when that principal rank is divided in secondary ranks for the first time (see Arts. 13b and 24b).

Definition XII – Author citation

The 'author citation' refers to the presentation of the name of the author(s) that published validly or validated the name of a given syntaxon; it is followed by the year of the valid publication or that of the validation (see Arts. 6 and 46).

Definition XIII – New names, conserved names and conserved types

The name of a new syntaxon (e.g. *associatio nova*, '*ass. nov.*') is a validly published name that is not based on a previously validly published name, neither it is a new combination, nor a name at new rank, nor a replacement name.

A new combination (*combinatio nova*, '*comb. nov.*') (Def. VII and Art. 26), or name at new rank (*status novus*, '*stat. nov.*') (Art. 27) is a new name based on a legitimate, previously published syntaxon name, which serves as its basionym.

A replacement name (*nomen novum*, '*nom. nov.*') is a new name published in accordance with Art. 39 as an explicit substitute for a rejected name, which is its replaced synonym.

A conserved name (*nomen conservandum*, '*nom. cons.*') is a validly published syntaxon name (Def. IV, Principle II) established according to special criteria (see Art. 52). It is protected, irrespective of its priority, and must be retained.

A conserved type (*typus conservandum*, '*typus cons.*') is a nomenclatural type established according to special criteria with the aim of protecting the application of a name (see Art. 53).

Definition XIV – Binding decisions

A binding decision is a recommendation about doubtful cases made by the Committee for Change and Conservation of Names that has been ratified by the Assembly of the Working Group for Phytosociological Nomenclature (GPN). These cases relate to (1) association names of the Uppsala School published before 1 January 1936 (Principle II), (2) effectively published works (Art. 1), (3) sufficiency of the original diagnosis of a name (Art. 2b), (4) abstract units qualifying as syntaxa (Art. 3c), (5) determination of the dominant strata (Art. 29b), (6) selection of the name-giving taxon for names published before 1 January 1979 (Art. 40), (7) *nomina inversa* (Art. 42), and (8) correct taxon name of a name-giving taxon (Art. 44).

The instructions to make a proposal for a binding decision are provided in Appendix VI. When ratified by the GPN Assembly, a recommendation will become binding, and as such listed in Appendix VII.

DIVISION II. Principles

Principle I – Governance of names of syntaxa

The regulations of this Code apply to the names of syntaxa published on or after 1 January 1910 (see Art. 2a). No other vegetation classification units are subject to the regulations of this Code. The names of other units do not have any bearing on the applicability of the names of syntaxa regulated by this Code.

Principle II – Governance of the hierarchy of syntaxa

This Code regulates the nomenclature of both the principal and secondary ranks of syntaxa according to Def. II.

Other ranks may be introduced in addition when in the author's opinion a greater number of ranks is required. The nomenclature of the other ranks, and of abstract

vegetation units without rank, such as 'community', 'vegetation type', 'Gesellschaft', 'peuplement', 'groupement', etc. is not subject to the regulations of this Code.

The ranks using German prefixes such as Haupt-, Regional-, Provinzial- and Klein- are also accepted at the given rank if they are not intended to serve as subordinated units, as well as similar terms in other languages (see Art. 3d). 'Hauptassoziation' ('main association'), 'Regionalassoziation' ('regional association') and 'Kleinassoziation' ('small association') are recognised as associations. 'Territorialassoziation' ('territorial association') and 'Provinzialassoziation' ('provincial association') are the equivalent of 'Regionalassoziation'. The ranks 'Regionalklasse', 'Regionalordnung', and 'Regionalverband' are recognised as class, order, alliance, respectively. Correspondingly, 'Haupt-Subassoziation' ('main subassociation') is considered a subassociation.

On the other hand, 'Assoziationsgruppe' ('group of associations') is not considered at the rank of association. 'Sociations' and 'consociations' of the Uppsala School are not syntaxa ruled by this Code. The same applies to those 'association names' of the Uppsala School published before 1 January 1936, as they correspond to 'sociations' (a term established by the Botanical Congress at Amsterdam 1935). For the sake of nomenclatural stability, some of the 'association names' of the Uppsala School published before 1 January 1936 can be considered as validly published by means of a binding decision (see Art. 2b) in so far as they fulfil all other requirements of this Code. If necessary, they can then be proposed as nomina conservanda (see Def. XIII and Art. 52). The 'association names' of the Uppsala School for moss and lichen communities are considered as validly published (see Def. I).

This Code governs rank changes between principal and secondary ranks as recognised by Def. II. A change between principal and secondary rank (Art. 27) or a change of position of a secondary rank (Arts. 26 and 28), or a replacement name (Art. 39) does not create a new syntaxon (see Def. XIII). Essentially, a new combination or a replacement name is renaming a syntaxon without publishing a name of a new syntaxon, so that the basionym (Def. XI) or the replaced synonym (Def. XIII) applies also to the new name.

Principle III – Correct names of syntaxa

Each syntaxon with a particular circumscription, position, and rank has only one correct name (see Art. 22). Alternative names (Def. VI, Note 2) correspond to different names that have no priority between them (see Art. 30). Alternative forms of names (Def. VI, Note 3) are authorised forms of the correct name.

Principle IV – Priority

Priority is the right to precedence established by the date of valid publication of a name. The principle of priority is to be used to promote stability. It is not intended to be used to reject a long-accepted name in its accustomed meaning through the introduction of an unused name that is its senior synonym. When an author considers that the application of the principle of priority would disturb stability or universality or cause confusion, the existing usage is to be maintained and the case be referred to the Committee for Change and Conservation of Names that would adopt a decision (see Def. XIII and Art. 52).

Note 1: Illegitimate names (see Def. V) have no priority over legitimate names, except in their effectiveness as homonyms because they are validly published names (see Art. 31).

Note 2: The date of a *nomen ineptum* (see Def. V) is the year of the publication of the original name for a correction (Arts. 43 and 44) and the year of the publication of the *nomen mutatum* for a mutation (Art. 45).

Principle V – Application of the nomenclatural type

The correctness of application of names of syntaxa is determined by means of nomenclatural types (type of the name).

Note 1: Illegitimate names can be chosen as nomenclatural types (see Art. 17).

Principle VI – Basic rank

Association is the basic rank of the hierarchical system of syntaxa governed by this Code (see Def. II).

Principle VII – Retroactivity of the Code

The regulations of the Code are retroactive unless explicitly stated otherwise.

DIVISION III. Rules and Recommendations

Chapter 1. Conditions and date of effective publication

Article 1 – Conditions and date of effective publication

Publication becomes effective by distribution (sale, exchange, gift) of printed matter produced by a press or offset means, to the general public or to libraries accessible to botanists. Any other kind of publication (e.g. mimeography, xerography, inkjet) is not considered as means of effective publication if they do not bear an International Standard Serial Number (ISSN) (introduced in 1975) or an International Standard Book Number (ISBN) (introduced in 1970). Content in external sources, such as microfiches or CD-ROMs for books and journals, is not effectively published.

On or after 1 January 2021, a publication will also be considered effective by the distribution of online electronic material in Portable Document Format (PDF) that would bear either an International Standard Serial Number (ISSN) or an International Standard Book Number (ISBN) or a Digital Object Identifier (DOI). The content of such an electronic publication cannot be altered after it was effectively published. Corrections or revisions must be issued separately as a new publication to be considered effectively published. Additional content of electronic publications accessed via a hyperlink, a URL (Uniform Resource Locator) embedded in text or as separate file(s) (e.g. so-called "supplementary material" or "online resource", or "supporting information" or "extended data"), is effectively published only if (a) it is in the form of a PDF accessible with a DOI, (b) it is fully retrievable via the DOI of the electronic publication, (c) it is explicitly recognised as a part of the publication by the publisher, and (d) it is typeset by the publisher. However, if the publisher denies being responsible for the content or the

functionality of the supplementary material, this material is not considered as effectively published.

Relevés in the form of PDF bearing a DOI and deposited on or after 1 January 2021 in freely accessed repositories, are effectively published. If there are later versions of the relevés bearing the same DOI, only the first version, that must be available and deposited on or after 1 January 2021, is considered as the effective publication.

For printed matter, the date of an effective publication is the date on which it became available as defined in §1 of this Article. In doubtful cases, the date appearing in the printed matter must be accepted as correct unless another date can be established from other sources. For an electronic publication, the date of the effective publication is the day when the definitive form (e.g. complete book, complete issue of a journal) is issued. Therefore, the date of a "first online publication" or "advanced online publication" is not accepted as the date of publication.

When reprints from periodicals or other works have been issued in advance, the date of effective publication is that day on which the reprints became available as defined in §1 of this Article.

Publications that do not meet the criteria above, yet considered important for nomenclatural stability reasons, can be submitted to the Committee for Change and Conservation of Names (CCCN) to be recognised as effectively published (for instructions see Appendix VI). The CCCN recommendations, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature, will become binding (see Def. XIV), and as such listed in Appendix VII.

Note 1: Mimeography is a duplication process using a stencil as the transfer medium through which the ink is forced through. Xerography is a generic duplication process proceeding by the dry deposition of toner (photocopy, laser copy). Inkjet printing is a computer printing by propelling droplets of ink onto paper.

Note 2: When a work is issued in several parts, and it is clear that the different parts are forming a single publication (same title, numbering of the different parts, bearing the indication "to be continued", "to be concluded", etc.), then the effective date of publication of a name is the date when the last condition for the valid publication was fulfilled (see Art. 6). Therefore, if all the conditions are fulfilled in a single part, the date of publication of a name is the one of that single part. Contrarily, if one condition occurs only in the last part, then the date of the name is that of the last part.

Note 3: An ineffectively published name according to Art. 1 is a *nomen ineditum* ('nom. ined.').

Examples

1. The name '*Festucetea ovinae* Knapp 1942' is not effectively published in Knapp (1942, p. 12) since the publication was reproduced by means of a hectograph without bearing an ISBN nor an ISSN.
2. Volume 4 of the journal *Materiały Zakładu Fitosocjologii Stosowanej Uniwersytetu Warszawskiego* does not appear to have been produced as a printed matter. Therefore, the name '*Dentario glandulosae-Fagetum*' in Matuszkiewicz (1964, p. 5) is not effectively published, even if the journal bears an ISSN since that number could not have been attributed before 1975.
3. The new name '*Puccinellio maritimae-Salicornietum emerici*' is effectively published in Géhu & Géhu-Franck (1979, pp. 351, 352, table 1) though the paper was reproduced by means of a photo offset directly from the type-written original.
4. The name '*Chenopodietea*' was effectively published by Braun-Blanquet on p. 298 in Braun-Blanquet, Roussine & Nègre (1952) as indicated in the *imprimatur* on the last page of the publication, and not in 1951 as often cited (probably according to the date of the preface).
5. The name '*Festucion versicoloris*' was effectively published by Krajina in 1933 on p. 53, as indicated on the cover of the first issue of the second part of the volume 51, and not in 1934 which is the date of the completion of the second part of the volume.
6. The names '*Phragmition*' and '*Phragmitetalia*' were effectively published by Koch in 1926 on p. 45 and not in 1925 as printed on the cover of the second part of the volume 61 of the journal. This case is not a doubtful case since on p. 62 of the first part of the volume 61 dated '1925', information is provided on the plenary session dated 24 February 1926 where the issue of Koch's paper had been announced. The date 1926 is confirmed on reprints of Koch's publication, which are dated with March 1926.
7. Beger's work *Assoziationsstudien in der Waldstufe des Schanfiggs* was published in two parts (*I. Beilage*, pp. 1–96 and *II. Beilage*, pp. 97–147) in the volumes 61 and 62 of the *Jahresbericht der Naturforschenden Gesellschaft Graubündens* issued in the years 1922 and 1923, respectively. As an offprint, it was also published in its entirety and distributed in 1922 as the volume 96 of the *Mitteilungen aus dem Botanischen Museum der Universität Zürich*. Therefore, the date of publication of the name '*Cariceto-Sieglingietum*' [*recte*: '*Carici-Sieglingietum*'] that appears on p. 109 is 1922.

8. The name '*Potentillion crassinerviae*' is validly published on p. 28 in Gamisans (1975) although it occurs in a thesis because the latter is an effective offset publication.

Recommendation 1A

Authors are requested to confine the publication of nomenclatural novelties to scientific journals and widely distributed monographs, and to avoid such publication in review periodicals, abstract books of congresses, footnotes, indices, correction slips, or in "supplementary material", "online resource", "supporting information" and the like. When published in books, the nomenclatural novelties should be confirmed in the index.

Recommendation 1B

When it has been shown that a date given on the printed matter is incorrect, the appropriate date should be published with an accompanying account of how the correct date was established.

Recommendation 1C

To ensure general recognition of new names of syntaxa and replacement names (see Def. XIII), new combinations (Def. VII), corrections of names (Arts. 43 and 44) and new alternative forms of the names (Art. 45), as well as lectotypifications or neotypifications of names (Def. VIII), authors are requested to register the effectively published novelties in the nomenclature database PhytoS (<http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/PhytoS.aspx>).

Chapter 2. Conditions and date of valid publication of names

Article 2 – Conditions of valid publication of names

The name of a syntaxon is only validly published:

- a. If it was effectively published in the year 1910 or later.

Example 1

The name '*Curvuletum*' in Brockmann-Jerosch (1907, p. 300) is not validly published since it was published before 1910.

b. If it is accompanied by a sufficient original diagnosis or by an unambiguous (direct or indirect) reference to an earlier, effectively published, sufficient diagnosis (see Arts. 7 and 8). For names published on or after 1 January 2002, only a direct reference is acceptable. In case of a dispute whether the original diagnosis of a syntaxon name satisfies the requirements of this Code, request for a decision may be submitted to the Committee for Change and Conservation of Names (CCCN) (for instructions see Appendix VI). The CCCN recommendation, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature, will become binding (see Def. XIV), and as such listed in Appendix VII.

Note 1: The original diagnosis of a name is the first description of that name that contains the necessary elements for the name to be validly published. It includes everything that is associated with the name at the time of its valid publication (e.g. description, designation of type, syntaxonomy, synonymy, bibliographical references, floristic, geographical – such as localities, coordinates – and ecological data, illustrations). The sufficient original diagnosis contains all the necessary valid elements for the name to be validly published (see also Arts. 3f, 5, 7, 8 and 18a).

Note 2: An indirect reference occurs when instead of the first effective publication a later publication of the same name is given that contains a direct reference to the first effective publication.

Note 3: Bibliographical errors in a reference (e.g. wrong number of volume or page) do not make the publication invalid (see Example 7).

Note 4: An unambiguous reference provides correctly the sufficient bibliographic data of a publication, either by following directly the author citation or in the bibliography.

Before 1 January 1979, the indication of the author, the year and the title of the work or the year, the title and the place of publication is considered sufficient as an unambiguous reference for books as well as monographs published in a book series. For an unambiguous reference to a work published in a journal, the indication of the author, the year and the name of the journal, or the name of the journal, the year, the volume and the pages, is sufficient. The abbreviation of the journal is acceptable.

On or after 1 January 1979, an unambiguous reference for books as well as monographs published in a book series comprises the author, the year, the title, the place of publication when it is given, and the publisher. For journals, an unambiguous reference comprises the author, the year, the title, the name of the journal, the volume, and the pages in the volume. The indication of the name of the journal, the year, the volume, and the pages is also acceptable.

On or after 1 January 2002, an unambiguous reference for books as well as monographs published in a book series comprises also the pages.

Examples

1. The name '*Triseteto-Polygonion*' [recte: '*Triseteto-Polygonion*'] in Braun-Blanquet & Tüxen (1943, p. 8) is not validly published since neither a sufficient original diagnosis nor a reference to such diagnosis is included.

2. The name '*Campanulo barbatae-Potentillion aureae*' in Foucault (1994, p. 438) is validly published since its diagnosis contains the name '*Aveno versicoloris-Nardetum strictae* Oberdorfer (1950) 1957' accompanied by an indirect reference to the original diagnosis of this name through the reference to the work published by Oberdorfer (1978) which contains the references to the effective publications of Oberdorfer (1950, 1957). The fact that the name '*Aveno-Nardetum*' is a *nomen superfluum* for the validly published name '*Aveno versicoloris-Hypochoeridetum uniflorae* Oberdorfer 1950' does not interfere with the validity status of the name of the new alliance (see Art. 17).

3. The name '*Potentillion calabrae* (Bonin 1978) all. nov.' in Foucault (1994, p. 441) is not validly published since there is no reference in Foucault (1994) to the original diagnosis of the type given for the new alliance name ('*Luzulo multiflorae-Nardetum strictae* Giacomini et Gentile 1966'), nor in Bonin (1978) which is cited as an indirect reference.

4. The name '*Juncetea trifidi* Hadač 1944' is validly published in Klika & Hadač (1944, p. 281) because there is an indirect bibliographical reference to the four orders mentioned in the original diagnosis ('*Androsacetalia alpinae* Br.-Bl. 1926', '*Salicetalia herbaceae* Br.-Bl. 1926', '*Caricetalia curvulae* Br.-Bl. 1926', '*Rhodoreto-Vaccinietalia* Br.-Bl. 1926'). Indeed, although there is no direct reference to "Braun-Blanquet (1926)" in Klika & Hadač (1944), the authors say in the introduction (p. 249) that their survey of syntaxa expands on an earlier survey published in the book "Praktikum rostlinné sociologie, půdoznalství, klimatologie a ekologie [Practical lessons in plant sociology, soil science, climatology, and ecology]. Praha, Melantrich 1941". In the latter book, there is an unambiguous reference to "Braun-Blanquet (1926)" [recte: Braun-Blanquet & Jenny (1926)] where all four orders are validly published. Although Klika & Hadač did not mention explicitly Klika & Novák (1941) as the authors of the "Praktikum", it is a sufficient reference before 1 January 1979 since it contains the title, the year and the place of publication.

5. The name '*Arrhenatherion elatioris*' is validly published in Koch (1926, p. 124) with the unique association '*Arrhenatheretum elatioris*', albeit Koch refers simply to 'Scherrer' for that association, without an indication of the year. In Koch's bibliography, there are two papers of Scherrer. In the one of Scherrer (1925) the association '*Arrhenatheretum*' is mentioned on p. 88 and it is accompanied with a table of 12 relevés.

6. The name '*Sambucetalia* prov.' in Oberdorfer (1957, p. 104) is validated in Doing (1962, p. 21) who clearly adopted the name and referred in the bibliography to Oberdorfer's work in indicating the author, the date and the title, providing in this way a sufficient reference for a monograph in a series before 1 January 1979.

7. Westhoff, Dijk & Passchier (1946, p. 59) include the 'associatie van *Philonotis fontana* en *Montia rivularis*' Büker et Tüxen 1941' in the alliance '*Cardamineto-Montion* Br.-Bl. 1926' [recte: *Cardamino-Montion*]. In the bibliography, there is no such a reference "Büker & Tüxen (1941)". Only "Büker (1941)" is cited [recte: Büker (1942)] where the '*Philonotis fontana*-*Montia rivularis*-Ass. Büker et Tx. 1941' is described on p. 470. The author citation "Büker et Tüxen 1941" instead of correctly "Büker et Tüxen in Büker 1942" (see Rec. 46C) is considered a bibliographical error.

c. If it is derived from scientific plant names (see Arts. 10 through 14).

d. If it is not published invalidly according to Arts. 3 and 4.

Article 3 – Additional reasons for the invalidity of names

The name of a syntaxon is not validly published:

a. When it is merely cited as a synonym or in the synonymy of the adopted name.

Example 1

The name '*Carpino-Fagetea*' in Jakucs (1960, p. 269) was invalidly published because it was given as "provisional" (Art. 3b). Soó (1964, p. 238) included this name in his work as a synonym of the '*Quercus-Fagetea* Br.-Bl. et Vlieger 37 em.'. However, as the name '*Carpino-Fagetea*' is given only as a synonym, not as the accepted name of the class, this does not constitute a valid publication.

b. When it is suggested by the author as a provisional name (*'nom. prov.'*) or as the name for a provisional syntaxon (e.g. *ass. prov.*), when it is not clearly adopted by the author(s), or when in the same publication the name is given in some place(s) as provisional and in other(s) as definitive.

Names that are indicated as "manuscript" ("Mskr.", "mscr.") or "ined." or "unpublished" are validly published if all the requested conditions for a valid publication are provided (see also Rec. 46E).

Examples

1. The name '*Festuco-Veronicetum verna* ass. nov. prov.' was not validly published in Oberdorfer (1957, p. 249).

2. Rivas Goday & Borja Carbonell (1961, p. 67) classified the order *Prunetalia* in the class *Querco-Fagetea* and made the following statement in the text: "We think that a new class (*Rhamno-Prunetea*) could be formed" [–translated from the Spanish]. Yet, the new class has not been clearly adopted and, therefore, the name '*Rhamno-Prunetea* Rivas Goday et Borja Carbonell 1961' was not validly published.

3. The name '*Teucrio-Inuletum* Horvat mskr.' is validly published in Horvat, Glavač & Ellenberg (1974, p. 104) with a synoptic relevé. Therefore, the fully spelled out citation of the name is '*Teucrio-Inuletum* Horvat in Horvat, Glavač et Ellenberg 1974'.

4. The name '*Galio-Conietum maculati* Rivas-Martínez inéd.' is validly published in López (1978, pp. 692, 694) who provided a table of four relevés. Therefore, the full name of this syntaxon reads '*Galio-Conietum maculati* Rivas-Martínez ex G. López 1978'.

c. When the vegetation unit is not a syntaxon (Def. I) or when it is a syntaxon without a rank (Def. II and Principle II). This includes compound names with 'community', 'community type', 'vegetation type', 'vegetation group', 'Gesellschaft', 'peuplement', 'groupement', 'nodum', 'coenon', etc.

In controversial cases concerning abstract units that qualify as syntaxa in accordance to Def. I, a request for binding decision may be submitted to the Committee for Change and Conservation of Names (CCCN) (for instructions see Appendix VI). The CCCN recommendation, when ratified by the Assembly of the Working Group for

Phytosociological Nomenclature, will become binding (see Def. XIV), and as such listed in Appendix VII.

Note 1: When a new syntaxon is indicated in the same publication, as a syntaxon without any rank as well as with an appropriate rank, then the page that includes the indication of the rank according to Principle II is accepted as the place of the valid publication of the name.

Examples

1. The names '*Crithmum maritimum* community' in Sunding (1972, p. 53), '*Agrostis rupestris*-*Juncus trifidus*-Gesellschaft' in Oberdorfer (1957, p. 307), 'peuplement de *Spartium junceum*' in Bannes-Puygiron (1933, p. 47), and '*Sphagnum cuspidatum*-*Rhynchospora alba* nodum' in Rybníček (1970, p. 247) are not validly published.

2. The new association '*Calamagrostio villosae*-*Franguletum*' in Passarge (1973) was validly published on p. 266 although the table 4 on p. 262, which the association is referred to, was headed with the name '*Calamagrostis villosa*-*Frangula*-Ges.'

3. The '*Ulmus*-*Acer*-*Tilia* ühing', '*Lonicera xylosteum*-*Ribes alpinum* i ühing' and '*Hepatica triloba*-*Pulmonaria officinalis* e ühing' in Lippmaa (1933, pp. 44–59 and table 8) are not validly published albeit they are called associations by the author ('ühing' means 'association' in Estonian) since they are one-layered units within a multi-layered forest phytocoenosis that, therefore, do not qualify as syntaxa (Def. I).

4. The '*Rhytidiadelphus triquetrus*-*Plagiochila asplenioides* e ühing' in Lippmaa (1933, pp. 49–56 and table 8) is not validly published albeit it is an association of bryophytes ('ühing' means 'association' in Estonian) since it is a one-layered unit on the forest floor within a phytocoenosis. Therefore, the '*Rhytidiadelphus triquetrus*-*Plagiochila asplenioides* e ühing' does not qualify as a syntaxon (Def. I).

5. The '*Myuretum*' in Waldheim (1944, pp. 70, 81) was validly published although it is a synusial unit given the union rank by the author since (1) it is a cryptogamic community delimited at fine spatial scale and defined by floristic-sociological criteria (Def. I), (2) it is not a structural, functional or temporal subset of a phytocoenosis (Def. I), and (3) the union – corresponding to association (Def. II, Note 3) – is an accepted rank before 1 January 2021 (Art. 3d).

d. When the indicated rank of the syntaxon does not correspond to ranks governed by the Code (Def. II).

On or after 1 January 2021, the naming of the rank for a new syntaxon name should follow only English or Latin terminology in accordance with Def. II (see also Art. 3i). The naming in another language is no more accepted (e.g. to use the German word "Verband" for "alliance"). In the same way, the use of a prefix expressing a territorial characteristic invalidates the names (e.g. "Hauptass.", "Regionalass."). The same applies for the use of the terms "*foederatio*", "*subfoederatio*", "*classicula*", "*ordulus*" and "*union*".

Before 1 January 2021, when one or more associations are included in a subordinated way in the same paper (e.g. an 'Assoziation' containing a 'Regionalassoziation') then only the association name(s) at the lowest level is (are) validly published. The same applies for subassociations. Conversely, when one or more ranks above the association are included in a hierarchical way (e.g. an alliance including a regional alliance), the name(s) of the subordinated rank(s) is (are) invalidly published.

Note 1: When a new syntaxon is indicated in the same publication as a syntaxon with both an inappropriate and appropriate rank, then the page that includes the indication of the rank according to Def. II is accepted as the place of the valid publication of the name.

Note 2: The regulation of subordinate syntaxa of the same rank (e.g. 'Hauptassoziation' and 'Regionalassoziation') was not ruled in the previous editions of ICPN and follows the empirical approach that has been mostly used in handling these situations.

Examples

1. The name '*Sedum villosum-Philonotis fontana-sosiasjon*' published by Nordhagen (1943, p. 432) is not validly published.
2. The name '*Carex limosa-Amblystegium scorpioides-Ass.*' published by Osvold (1923, p. 182) is not validly published as it corresponds to an association of the Uppsala School published before 1 January 1936. Therefore, it is in fact a sociation and not an association.
3. The name '*Atripliceto-Chenopodietalia*' [*recte: Atriplici-Chenopodietalia*] published by Nordhagen (1940) is mentioned on p. 52 as a "Vereinsgruppe" and on p. 53 as an order. Therefore, the name is validly published on p. 53.
4. Passarge (1968, p. 77) published the order 'O 1: *Eriophoro-Pinetalia*' which includes two 'regional orders' 'a' and 'b', namely 'Reg. O. a: *Eriophoro-Pinetalia silvestris*' and 'Reg. O. b: *Eriophoro-*

Piceetalia abietis'. The two latter 'regional orders' are invalidly published since they are subordinate to an order (Principle II), and only the name '*Eriophoro-Pinetalia*' is validly published.

5. Soó (1962, p. 344) published the name '*Melitti-Fagetum*' [recte: '*Melittio-Fagetum*'] which referred to a "main association" ("Hauptassoziation"). In this unit Soó included three "regional associations" ("regionale Gebietsassoziationen") such as '*Melitti-Fagetum subcarpaticum*', '*Melitti-Fagetum hungaricum*' and '*Melitti-Fagetum noricum*'. Since the association '*Melitti-Fagetum*' contains other associations as subunits, only the names of the three regional associations are validly published, albeit they are all illegitimate (Art. 34a). The name '*Melitti-Fagetum*' for the main association is not validly published.

6. In the phytosociological study on the forests of Croatia performed by Horvat (1938) the '*Fagetum silvaticae croaticum*' was subdivided into several subunits. However, the subdivision in the text (p. 189) does not match exactly the one in the heading of the table III. In the text, the association is first divided into two geographical races ('*boreale*' and '*australe*') in which three subassociations can be recognised, namely '*montanum*' (p. 197), '*abietosum*' [recte: '*abietetosum*'] (p. 200), and '*subalpinum*' (p. 206), with only the first two subassociations occurring in the geographical race *boreale*. In that latter race, the subassociation *montanum* is then further subdivided into two facies: the '*lathyretosum*' and the '*corydaletosum*'. Since geographical race and facies are not ranks ruled by this Code, only those three subassociations are validly published: the legitimate '*Fagetum silvaticae croaticum abietetosum*', and the two illegitimate ones (Art. 34a), namely the '*Fagetum silvaticae croaticum montanum*' and the '*Fagetum silvaticae croaticum subalpinum*'.

e. When the rank indicated does not correspond to the form of the name. The names of suballiances, suborders, and subclasses that were formed with the termination of the principal rank before 1 January 1979 (see Arts. 11 and 41b) are exempt from this prescription.

Note 1: When the form of a new name is indicated in the same publication with both an inappropriate and appropriate form corresponding to the rank, then the page that includes the indication of the appropriate form is accepted as the place of the valid publication of the name.

Examples

1. The association name '*Ericetum tetralicis*' is validly published on p. 110 in Tüxen (1937) though the new association name occurs only with subassociation epithets, for instance the '*Ericetum tetralicis typicum* Tx. 1937'.

2. The name 'asociace *Fagetum asperuletosum*' in Šmarda (1950, p. 143) is not validly published as an association. In the same way, the name '*Dicranoweisietum cirrhatae*' in Duvigneaud (1942, p. 43) designated as a subassociation of the '*Syntrichietum laevipilae* (Allorge 1922) Ochsner 1928', is not validly published.

3. The name '*Trifolietum alpini*' in Rübél (1911, p. 166) is not validly published since the rank of the syntaxon is indicated as a secondary rank ('Nebentypus') corresponding to an edaphic variant of a subassociation.

4. The name of the suballiance '*Glauco-Juncion maritimi* Géhu et Géhu-Franck ex Géhu *suball. nov. hoc loco*' published on p. 27 in Bardat et al. (2004) has a form corresponding to an alliance. Since the form of the name is not in accordance with the rank, the name is not validly published.

f. When the name-giving taxon (taxa) is not indicated in the valid elements of the original diagnosis (see Art. 2b) either directly or indirectly (i.e. in the original diagnoses of the subordinate syntaxa that have been quoted in the original diagnosis of a syntaxon above association) (see also Art. 10a).

On or after 1 January 2002, see also Art. 16 for names of new associations and subassociations.

On or after 1 January 2021, see also Art. 17 for names of new syntaxa above the association rank.

Note 1: For the association and the subassociation, the name-giving taxon (taxa) (see Art. 10, Note 1) must be present in the relevés belonging to the original diagnosis of that association or that subassociation. The synoptic tables also qualify as valid elements before 1 January 1979.

For the syntaxa above the association rank, their original diagnosis contains at least one syntaxon of the next subordinate principal rank (see Def. II, Art. 8), and therefore:

- for an alliance, the name-giving taxon (taxa) must be present at least in one relevé among the relevés (and synoptic tables before 1 January 1979) of the original diagnoses of the associations that have been quoted in the original diagnosis of the alliance,
- for an order, the name-giving taxon (taxa) must be present at least in one relevé among the relevés (and synoptic tables before 1 January 1979) of the original diagnoses of the associations that have been quoted in the original diagnoses of the alliances given in the original diagnosis of the order, and
- for a class, the name-giving taxon (taxa) must be present at least in one relevé among the relevés (and synoptic tables before 1 January 1979) of the original diagnoses of the associations that have been

quoted in the original diagnoses of the alliances given in the original diagnoses of the orders that are present in the original diagnosis of the class.

Examples

1. The name 'asociace *Festuca duriuscula-Alyssum saxatile*' in Klika (1942, p. 6) is not validly published since '*Alyssum saxatile*' is not indicated in the two relevés present in the original diagnosis.

2. The name '*Parietario-Galion*', or the inverted form '*Galio-Parietaron*', has been published several times before its valid publication by Bolòs in 1967 on p. 14 ('*Galio-Parietaron* ("*Galio-Parietaron murale*") Rivas Martínez in Rivas Goday 1956) Rivas Martínez 1960' [recte: '*Galio valantiae-Parietaron judaicae* Rivas-Martínez ex O. de Bolòs 1967]). For instance, in Rivas Goday (1964, p. 106) the alliance '*Parietario-Galion muralis* Riv. Mart. 1955' contains two associations, each one with relevés, the 'As. nova *Parietarium mauritanicae bethuricum*' and 'As. *Oryzopsis miliacea et Anthirrhinum australe*'. Nevertheless, the name '*Parietario-Galion muralis*' is not validly published. Indeed, although the 'As. *Oryzopsis miliacea et Anthirrhinum australe*' contains *Galium murale* (L.) All. 1785 and the '*Parietarium mauritanicae bethuricum*' contains *Parietaria mauritanica* Durieu 1847, the latter association is not properly retained by the author (Art. 3b). Consequently, the original diagnosis of the alliance contains no species of the genus *Parietaria* L. 1753 and, therefore, the name '*Parietario-Galion*' is invalidly published in Rivas Goday (1964).

3. The name '*Lithophyllion* Giaccone 1965' [recte: 1967] is validly published in Giaccone (1967, p. 60). Giaccone, Anlongi, Pizzuto & Cossu (1994, p. 217) added a specific epithet to complete it as '*Lithophyllion grandiusculi* Giaccone 1965'. However, the only species of the genus *Lithophyllum* occurring in the original diagnosis of the alliance is *L. solutum* (Foslie) Me. Lemoine 1915. Therefore, in introducing the epithet '*grandiusculum*', Giaccone et al. (1994) published a new, invalid name, the '*Lithophyllion grandiusculi* Giaccone, Anlongi, Pizzuto et Cossu 1994'. Since the specific epithet '*grandiusculum*' introduced by Giaccone et al. (1994) is not in accordance with Rec. 10C, the correct name of the alliance can only read '*Lithophyllion soluti* Giaccone 1967'.

g. When it has been published on or after 1 January 1979 and it is not clear from what name of a taxon (species or infraspecific taxon) it is formed that is present in its original diagnosis (see also Art. 3f, Note 1).

Examples

1. The name '*Sorbo-Fraxinetum*' in Béguin & Theurillat (1981, p. 141) is not validly published since both *Sorbus aria* (L.) Crantz 1763 and *S. mougeotii* Soy.-Will. & Godr. 1859 are present in the original diagnosis and there is no clear indication from which the name has been formed.

2. The name '*Poo-Euphorbietum esulae*' in Passarge (1989a, p. 125) is published validly, even when *Poa angustifolia* L. 1753 and *P. trivialis* L. 1753 are present in the original diagnosis. It is clear from the table and text that *P. angustifolia* is to be regarded as the name-giving species, and that *P. trivialis* is included in the original diagnosis only as an accidental species.

3. The name of the new suborder '*Lathyro-Carpinetalia betuli*' in Täuber (1987, p. 180) is not validly published since it is not clear which *Lathyrus* species is used in the formation of the name; *L. hallersteinii* Baumg. 1816, *L. transsilvanicus* (Sprengel) Fritsch 1895 and *L. velutinus* auct. are given as character species of the order.

4. The name '*Astragalo-Seslerietum*' Richard (1985, p. 200) is not validly published since all the three species of the genus *Astragalus* present in the original diagnosis (*A. leontinus* Wulfen 1781, *A. australis* (L.) Lam. 1778, *A. monspessulanus* L. 1753) are considered by the author to pertain the name ('la pelouse à Sesslerie et Astragales'), even though *A. leontinus* is the most abundant of these species and is indicated as a character species in the text.

5. Almeida, Cleef, Herrera, Velasquez & Luna (1994, p. 401) published the name '*Bartramia potosicae-Bryoerythrophyllum jamesonii*'. Even if both *Bartramia potosica* Montagne 1838 and *B. ithiphylla* Brid. 1803 are listed on the same line ('*Bartramia potosica/B. ithiphylla*') in the vegetation table, the name of the syntaxon is validly published because only *B. potosica* occurs in Mexico and '*Bartramia potosica /B. ithiphylla*' would indicate only that *B. potosica* is included in *B. ithiphylla* in a wide acceptance of the latter.

6. The name '*Bupleuro-Brometum condensati* Poldini et Feoli Chiapella' in Feoli Chiapella & Poldini (1993, p. 28) is published with the indication "*Bupleurum ranunculoides* (cfr. *B. canalense*, *B. gramineum*)" in the table as the name giving-taxon, because both critical taxa, namely *B. canalense* Wulfen ex Spreng. 1820 and *B. gramineum* Vill. 1779, belong to the *B. ranunculoides* complex. As the authors explain (p. 7), the indication of all the three taxa merely reflects the unclear taxonomic value of *B. canalense* as compared to *B. gramineum* within the *B. ranunculoides* complex, as it is effectively reported in the floristic literature (Pignatti, 1982) which the authors refer to. Therefore, the name is formed only with *Bupleurum ranunculoides* in a wide acceptance and the '*Bupleuro ranunculoidis-Brometum condensati* Poldini et Feoli Chiapella in Feoli Chiapella et Poldini 1993' is validly published.

h. When it has been published on or after 1 January 1979 in the form indicated in Art. 12 §1 (with a prefix expressing morphological or ecological characteristics, or with *Eu-*), in Art. 14a (formed from one or two scientific plant names with no termination indicating the

rank), in Art. 14b (with a specific epithet not being a generic name), in Art. 34a (with an epithet in the nominative case that indicates a geographical, morphological, ecological or other property).

Autonyms of ranks higher than association composed with the prefix *Eu-*, and names at a new rank based on basionyms published before 1 January 1979 with a prefix expressing a morphological or an ecological characteristic, are exempt from this rule (see Arts. 24b and 27).

Note 1: Names of syntaxa higher than association validly published before 1 January 1979 and formed with a prefix expressing morphological or ecological characteristics (Art. 12), have been handled diversely throughout the editions of the Code regarding a division (Art. 24) or a change of rank (Art. 27a). Before 1 January 2002, the editions 1 and 2 forbade using such names, and other names had to be published instead. On or after 1 January 2002, edition 3 allowed their use in a division (Art. 24) or in a reduction of rank (Art. 27), but not in raising a syntaxon of secondary rank into the next principal rank. All the names validly published before 1 January 2021 in accordance to the former rules are legitimate but must be superseded by the names formed according to Arts. 24 or 27a, respectively, when the latter names would become available. However, the names to be superseded can be proposed for conservation (see Art. 52).

Examples

1. The name '*Xerobromenalia*' in Royer (1991, p. 207) is not validly published since it was published after 1 January 1979 and it contains a prefix expressing an ecological characteristic in accordance with Art. 12, and it is not a change of rank of an already published name.
2. The names '*Atriplex halimus-Lycium europaeum* ass.' in Bornkamm & Kehl (1990, p. 170) and '*Ass. Nardus stricta-Helianthemum grandiflorum*' in Rajeovski (1990, p. 34) are not validly published since they were published after 1 January 1979 and their form is not in accordance with Art. 14.
3. The name '*Seslerio-Mesobromion* (Oberdorfer 1957) Theurillat' in Theurillat & Béguin (1985, p. 77) is validly published because the prefix with an ecological characteristic in accordance with Art. 12 comes from the basionym ("Unterverband: *Seslerio-Mesobromion* Oberdorfer 1957") that has been published before 1 January 1979.
4. Izco & Molina (1989, p. 97) raised the suballiance '*Xero-Aphyllanthenion* Rivas Goday et Rivas-Martínez 1969' (Rivas Goday & Rivas-Martínez, 1969, pp. 26, 29) to the rank of alliance and used the name '*Sideritido incanae-Salvion lavandulifoliae*'. The latter name must be superseded by the name '*Xero-Aphyllanthon*', yet to be published, in accordance with Art. 27. However, the '*Sideritido incanae-*

Salvion lavandulifoliae Izco et Molina 1989' can be proposed for conservation since it was published before 1 January 2021.

i. When it has been published on or after 1 January 2002 without being indicated explicitly as new.

On or after 1 January 2021, only the Latin or English terminology must be used to designate a new name of a syntaxon, for the Latin terminology either in its abbreviated form ('*nov.*') or in full (*novus, nova, novum*), in the following format: '*ass. nov.*' (*associatio nova*) or 'new association', '*all. nov.*' (*alliancia nova*) or 'new alliance', '*ord. nov.*' (*ordo novus*) or 'new order', '*subass. nov.*' (*subassociatio nova*) or 'new subassociation', etc. Accordingly, a new combination (see Def. VII, and Art. 26) must be designated with '*comb. nov.*' (*combinatio nova*) or 'new combination', a new rank (see Art. 27) with '*stat. nov.*' (*status novus*) or 'new status', a new name to substitute a rejected name (see Art. 39) with '*nom. nov.*' (*nomen novum*) or 'replacement name', a new correction (see Art. 43) with '*nom. corr. nov.*' (*nomen correctum novum*) or 'new correction', and a new mutation (see Art. 45) with '*nom. mut. nov.*' (*nomen mutatum novum*) or 'new mutation'.

These provisions also apply to the validation of invalidly published names (see Art. 6).

Examples

1. The names '*As. Roystoneo hispaniolanae-Pterocarpetum officinalis nova*' and '*Al. Marcgravio rubrae-Pterocarpion officinalis nova*' in Cano, Velóz Ramírez, Cano-Ortiz & Esteban Ruiz (2009, p. 570) are validly published as they are explicitly indicated as new ("*nov.*") although the formulation '*ass. nov.*' respectively '*all. nov.*' was not used.

2. The name '*Brachypodio sylvatici-Festucetum giganteae* B. Foucault & Frileux ex Foucault *hoc loco*' published in Catteau (2014, p. 137) is not validly published because nowhere the name is explicitly indicated as a new name. Therefore, the name '*Brachypodio sylvatici-Festucetum giganteae* B. de Foucault et Frileux ex B. de Foucault in Catteau 2014' is invalidly published.

Recommendation 3i

It is recommended to use the more straightforward Latin terminology to indicate nomenclatural novelties, and to place it, either in the abbreviated form or in full, right after the name.

j. When it has been published on or after 1 January 2002 simultaneously with one or more alternative names (Def. V; see also Art. 30 §1).

Examples

1. In Oberdorfer (1957, p. 475) the name '*Dentarieto enneaphyllidis-Fagetum*' [recte: *Dentario enneaphylli-Fagetum*], cited in bold between brackets immediately after the name '(*Abieti-*) *Fagetum sudeticum* Preis 1938', is not a synonym in the sense of Art. 3a but an alternative, validly published name, as a matter of fact the correct name for the *Fagetum sudeticum* Preis 1938 (see Art. 39a). On the other hand, the name '*Abieto-Fagetum oriento-bavaricum* Volk 38 mss.', cited between brackets below the two accepted names, is a synonym.

2. Horvat (1938) published on p. 189 the name '*Fagetum silvaticae croaticum*' for which he proposed on p. 212 the name '*Fageto-Lamietum orvalae*' [recte: *Lamio orvalae-Fagetum silvaticae*]. The latter is an alternative, validly published name. As a matter of fact, it is the correct name for the '*Fagetum silvaticae croaticum* Horvat 1938' (see Art. 39a, Example 2) and it has been typified by Marinček et al. (1993, p. 126).

k. When it has been published on or after 1 January 2002 and it has not been formed from a taxon of the highest dominant stratum determining the vertical structure (see Art. 29b).

l. When the name-giving taxon (taxa) has (have) not been earlier or simultaneously validly published (see also Art. 10a, Notes 1 and 2).

If an aggregate, group or *grex* – taxonomic ranks not recognized in the International Code of Nomenclature for algae, fungi, and plants – is used as a name-giving taxon, the syntaxon name is validly published if the species name or the infraspecific name used to name the aggregate, group or *grex* is validly published. When the infraspecific epithet is not validly published, then the specific epithet is to be used as the name-giving taxon (see also Art. 10a, Note 1).

Examples

1. The name '*Caricetum oenensis*' in Seibert (1962, p. 57, table 11) has not been published validly since the name-giving taxon '*Carex oenensis*' was not validly published at that time (see Art. 6, Example 3).

2. Theurillat (1989, p. 76) published the new association '*Phyteumo nanae-Caricetum curvulae*' [recte: '*Phyteumato nani-Caricetum curvulae*'], which was based upon *Phyteuma nanum* Schur. 1852. Although in use in current floras, this name is, however, a *nomen nudum* for *Phyteuma confusum* A. Kerner 1870. Therefore, the name '*Phyteumato nani-Caricetum curvulae*' is not validly published. Theurillat (1996, p. 280) published validly the name '*Phyteumato confusi-Caricetum curvulae*' for this association.

3. Zöttl (1951, pp. 36, 70) published the '*Pinus montana prostrata-Erica carnea*-Assoziation' based upon the aggregate '*Pinus montana grex prostrata* (Tubeuft) Braun-Blanquet'. Although "grex" is not a taxonomic recognized rank, the association name is validly published since the name *Pinus montana* var. *prostrata* Tubeuft 1912 is validly published. Following Arts. 10b and 42 the name must be inverted to '*Erico carnea-Pinetum prostratae* Zöttl 1951 *nom. invers.*'. The name should also be corrected (Art. 44), what will produce a later, illegitimate homonym (see Art. 44, Example 5).

4. Pignatti (1953, 71) published the name '*Cakilion littoralis*' based on the variety name '*Cakile maritima* var. *littoralis*'. However, although the species name *Cakile littoralis* Jordan 1864 is validly published, the name-giving taxon is not validly published at the varietal rank used by Pignatti and, therefore, the name '*Cakilion littoralis*' is not validly published (see also Art. 10a, Note 1).

5. Lazare & Riba (2010, p. 25) published validly the new association *Isoetetum creussensis* the name of which is based on the new species *Isoetes creussensis* Lazare & Riba 2010 that is validly described in the same publication on p. 21.

m. When it has been published on or after 1 January 1979, and if it stems from a division of a principal into a secondary rank (Art. 24), or a change in rank (Art. 27), and it is not in accordance with the corresponding rules (see also Art. 3h for exceptions).

n. If it is a replacement name (*nomen novum*) and it is not in accordance with Art. 39.

Example 1

Biondi & Allegrezza (1996, p. 123) published the *nomen novum* '*Lonicero xylostei-Quercetum cerridis* (Taffetani et Biondi 1993)' [recte: 1995] without indicating which name it replaced. In the publication of

Taffetani & Biondi (1993) [*recte*: 1995] there are four names validly published: '*Carpino orientalis-Quercetum cerridis* Blasi ex Taffetani et Biondi 1995', '*Daphno laureolae-Quercetum cerridis* Taffetani et Biondi 1995', '*Lonicero xylostei-Carpinetum orientalis* Taffetani et Biondi 1995', and '*Violo hirtae-Carpinetum orientalis* Taffetani et Biondi 1995'. The *nomen novum* is not validly published since there is no indication, which of these names was replaced, and no indirect way to ascertain this information.

- o. If it is not typified in accordance with Art. 5.
- p. When it has been published on or after 1 January 2021 and it is formed from more than two name-giving taxa for an association and the higher ranks, or more than one name-giving taxon for a subassociation (see Arts. 10a and 34c).
- q. If the correction or the change of the name of a syntaxon is not in accordance with Arts. 40b, 43 and 45.

Article 4 – Additional causes of invalid publication of names of secondary ranks

- a. The name of a syntaxon of secondary rank is not validly published when it is not subordinate to a syntaxon of the corresponding principal rank or if the name of the syntaxon of principal rank is not validly published (see also Art. 29d).

Examples

1. The name '*Melica*-Buchenwald Subass. von *Luzula nemorosa*' in Tüxen (1954, p. 467) is not validly published because '*Melica*-Buchenwald' does not correspond to the rank of association (see Art. 3c).
2. In Eig (1939), the class '*Retametales arenariae*' on p. 268, the order '*Retametalia arenaria sinaico-palaestina*' on p. 268, and the suborder '*Retametalia arenaria palaestina*' on p. 269 are validly published. This is, however, not the case of the suborder '*Retametalia arenaria sinaica*' on p. 269 which is a *nomen nudum*. Both suborders are mentioned for the section featuring 'Psammophytic associations' in Eig (1946), with an unambiguous reference to Eig (1939) for the suborder '*Retametalia arenaria palaestina*'. In this way, the second suborder '*Retametalia arenaria sinaica*' is also implicitly referred to the order '*Retametalia arenaria sinaico-palaestina* Eig 1939'. Since the original diagnosis of the suborder '*Retametalia arenaria sinaica*' is deemed sufficient in Eig (1946), the name is validly published. All three valid names are, however, illegitimate (Art. 34a).

3. The subassociation name '*Ononido variegatae-Linarietum pedunculatae linarietosum (mumbyanae) pygmaeae*' in Díez Garretas (1984, pp. 74, 76) is not validly published because (a) the association name '*Ononido variegatae-Linarietum pedunculatae* Díez Garretas, Asensi et Esteve 1978' is a *nomen nudum* (Art. 2b) in Díez Garretas, Asensi & Esteve (1978, p. 78) and (b) the association name is not formerly validated simultaneously by the publication of the subassociation '*linarietosum pygmaeae*' in 1984. Indeed, although the type relevé is indicated for the subassociation, the association name remains invalidly published because no type relevé is given for it (Arts. 5 and 6). Therefore, the subassociation name '*Ononido variegatae-Linarietum pedunculatae linarietosum pygmaeae*' is invalidly published. The association and the subassociation names were validated later by Díez Garretas in Izco, Guitián & Guitián (1988, pp. 214–215).

- b. The name of a subassociation is not validly published when a change in the position is performed and a passing reference is made to the altered association to which it now belongs, but the new name combination is not used.
- c. On or after 1 January 1979, the name of a subassociation is not validly published when carrying the epithet '*normale*' (see Art. 13a).

On or after 1 January 1979, a subassociation named with the epithet 'typical' instead of '*typicum*' is invalidly published.

Note 1: A subassociation that the author considers 'typical' or representing the 'typical' aspect of an association is validly published on or after 1 January 1979 in so far as all other requirements of this Code are fulfilled (see Art. 5b, Example 2).

- d. A subassociation *typicum* that does not contain the type of the association is invalidly published.
- e. On or after 1 January 2021, a subassociation containing the type of the association in its original diagnosis is invalidly published if it is not named '*typicum*' (autonym, see Art. 13b).

Article 5 – The nomenclatural type

- a. Indication of the type:

On or after 1 January 1979, the name of a new syntaxon is validly published only when the nomenclatural type is indicated in accordance with Arts. 16 through 18 or when only one element suitable for typification occurs.

Before 1 January 2002, an asterisk (*) marking a relevé in a table is sufficient to recognise the type relevé when that table, or a corresponding group of relevés in that table, refers to a new association or a new subassociation, provided a clear mentioning as 'new' is given in the text.

On or after 1 January 2002, the Latin word '*typus*' ('*holotypus*', '*lectotypus*', '*neotypus*') is to be used for the designation of the type of the name of a syntaxon when the type is chosen among more than one suitable element.

On or after 1 January 2021, the Latin word '*typus*' ('*holotypus*') is to be used also when only one suitable element for the type occurs in the original diagnosis of a name.

Examples

1. The name '*Ranunculo repentis-Rumicenion crispum* Hejný & Kopecký 1979' in Hejný, Kopecký, Jehlík & Krippelová (1979, p. 74) is not validly published since the original diagnosis of the suballiance contains several validly published associations and no nomenclatural type is indicated.
2. The new name '*Rumici crispum-Agropyretum repentis* Hejný' in Hejný et al. (1979, p. 77) is validly published since the original diagnosis contains only one relevé which is the holotype of the name.
3. The name '*Teucrietum scorodoniae*' in Pott (1992, p. 297) has not been validly published since three elements (relevés 1 to 3 in table 8) have been indicated as the nomenclatural type instead of one.
4. In an attempt to validate the name '*Salvio cryptanthae-Stipetum lessingiana*' that was invalidly published in Akman, Ketenoğlu, Quézel & Demirors (1984, p. 570) due to a missing type relevé, Quézel, Barbero & Akman (1993, p. 86) indicated the relevé 1 in the table 2 ("T. 2, r. 1") of the work published in 1984 as the type. No relevé 1 is included in that table 2, thus this attempt failed.
5. Biondi (2007, p. 7) described the new order '*Senecetalia cinerariae*' [*recte: Senecionetalia cinerariae*] using an unambiguous reference to the validly published alliance '*Anthyllidion barbae-jovis* Brullo et De Marco 1989' serving as the type of the order. Although Biondi did not use the Latin word '*typus*' to indicate the type, the name of the new order is validly published since it has been published before 1 January 2021 and there was only one suitable element for the typification.

6. Barbero & Quézel (1980, pp. 182–183) described a new association '*Prasio majoris-Ceratonietum siliquae*' without an explicit indication of the type relevé. However, in the table 1 referring to the association, there is an asterisk (*) marking the relevé 15. The name '*Prasio majoris-Ceratonietum siliquae*' is validly published, since the asterisk is considered a sufficient indication of the identity of the type relevé before 1 January 2002.

b. Subassociations published simultaneously with a new association:

When a new association is simultaneously published with two or more subassociations, the type of the association name becomes automatically the type of the subassociation *typicum* (autonym, see Art. 13b).

Before 1 January 2002, if the type of an association differs from that of the subassociation *typicum* published simultaneously, then the type of the association must become the type of a new subassociation *typicum* (autonym, see Art. 13b). The former subassociation *typicum* not containing the type of the association is invalidly published retroactively (Art. 4d).

Before 1 January 2021, if no type has been designated for an association simultaneously published with a subassociation *typicum* or with a subassociation explicitly designated as 'typical', then the type of the subassociation *typicum* or that of the 'typical' subassociation is automatically the type of the association (Example 1; see also Arts. 4d and 13b).

Note 1: The establishment of another association type than that of the subassociation '*typicum*' was allowed until 1 January 2002, and it was possible until 1 January 2021 to not name '*typicum*' the subassociation containing the association type (Art. 5, ed. 3). As a consequence of the introduction of the autonym rule (Art. 13):

- (1) A new name should be published to maintain the subassociation '*typicum*' not containing the type of the association since such an epithet '*typicum*' is invalid (Art. 4e).
- (2) The epithet of the subassociation not named '*typicum*' that contains the type of the association retains priority for homonymy within the pertinent association (see Art. 26).

Examples

1. Vanden Berghen (1990, pp. 37, 80) described a new association '*Aristidetum sieberianae*' with three subassociations '*typicum*', '*hibiscetosum asperi*' and '*loudetietosum hordeiformis*'. A type relevé was given for each subassociation, but not for the association name. However, before 1 January 2021, the

type of the subassociation *typicum* is automatically the type of the association name when no type has been designated for the latter. Therefore, the name '*Aristidetum sieberianae*' is validly published.

2. Bianco, Brullo, Pignatti & Pignatti (1988, p. 143) validated the name '*Aubrieto-Campanuletum garganicae*' [*recte: Aubrieteto-Campanuletum garganicae*] by indicating the type relevé that was missing in an earlier publication (Trinajstić, 1980). Simultaneously, these authors differentiated two subassociations, namely '*aubrietetosum*' and '*campanuletosum*'. Despite the missing type relevé, the subassociation *aubrietetosum* is validly published as it represents the "typical aspect of the association", hence the type relevé of the association is automatically the type of the typical subassociation. However, the subassociation '*aubrietetosum*' must become the subassociation *typicum* (autonym).

3. Klein & Lacoste (1991, p. 81) described a new association '*Aceri hircani-Quercetum macranthae*' containing three subassociations, namely the '*festucetosum*', '*agropyretosum*' and '*polystichetosum*' for which the nomenclatural types have been designated. Since no type was designated for the association name, and since no automatic type exists through a subassociation given the epithet '*typicum*' or by the designation of a typical subassociation, the association name is not validly published. The same is true for the three subassociation names according to Art. 4a.

4. Barbero & Quézel (1980, pp. 182–183) published validly the new association '*Prasio majoris-Ceratonietum siliquae*' (see Art. 5a, Example 6). The association contains the subassociations '*euphorbietosum dendroidis*', '*rhamnetosum oleoidis*' and '*hypericetosum empetrifolii*'. Although the type of the association, indicated by an asterisk (*) in the table 1, belongs to the group of relevés 9 through 18 that can be referred to the subassociation *rhamnetosum oleoidis*, none of the three subassociation names are validly published since no type is indicated for any of them, and the subassociation *rhamnetosum oleoidis* is not designated as the typical subassociation.

5. The association '*Seslerio calcareae-Saxifragetum paniculatae*' in Accetto (2004, pp. 21, 27) has been published simultaneously with three subassociations, namely the '*typicum*', '*cerastietosum stricti*' and '*festucetosum amethystinae*'. However, the author specifically mentioned that the type of the name of the association is the type of the subassociation *festucetosum amethystinae*, instead of the type of subassociation *typicum*. Since the publication occurs before 1 January 2021, the association name and the epithet *festucetosum amethystinae* are validly published. However, the subassociation *festucetosum amethystinae* must become the subassociation *typicum* (autonym).. On the opposite, the subassociation *typicum* is invalid since its type is not the type of the association (Art. 4d).

Recommendation 5A

The nomenclatural type should be clearly indicated and placed as close as possible after the name it refers to.

Article 6 – Date of a name or of an epithet

The date of a name or of an epithet is that of its first valid publication. When the various conditions for a valid publication are not simultaneously fulfilled, the date of a name is that on which the last condition has been fulfilled.

Names not validly published according to Arts. 2, 3 and 4 can be validated later, their original forms permitting. The validation is performed with the effective publication of the correct form of the name and the missing provisions, accompanied with an unambiguous reference to the effective publication of the other elements needed for the valid publication of the given name (see Art. 1, Note 2; Art. 2; see also Arts. 3i and 9).

Examples

1. The name '*Parietario-Centranthion rubri* Rivas-Martínez' was published on p. 165 in Rivas-Martínez (1960) and not in 1955 as given in this publication. It was not validly published since no subordinate association was given. This condition was first fulfilled in Rivas-Martínez (1969, p. 10), hence 1969 is the date of the name.

2. The name '*Sorbo-Fraxinetum*' was published invalidly (see Art. 3g, Example 1) by Béguin & Theurillat (1981). The validation was performed by Béguin & Theurillat (1984, pp. 667, 669) by publishing the syntaxon name '*Sorbo ariae-Fraxinetum excelsioris*' with the name-giving taxon of the genus *Sorbus* accompanied with an unambiguous reference to the original publication in 1981 which contains all the other necessary provisions.

3. The name '*Caricetum oenensis*' in Seibert (1962, p. 57, table 11) was not validly published since the name-giving taxon was not validly published at that time (Art. 3i). This condition has been fulfilled in Wallnöfer (1992, p. 832), hence the name '*Caricetum oenensis* Seibert ex Balátová-Tuláčková, Mucina, Ellmauer et Wallnöfer 1993' has been validly published by Balátová-Tuláčková, Mucina, Ellmauer & Wallnöfer (1993, p. 102) by indicating the type relevé among Seibert's relevés according to Art. 5. However, the type of *Carex oenensis* Wallnöfer 1992 refers to a hybrid between *C. acuta* L. 1753 and *C. randalpina* Wallnöfer 1993, which is the correct name for the species (see B. Wallnöfer, 1993). Since both the hybrid and the true species occur in the region studied by Seibert, the name may have to be corrected according to Art. 43 if *C. x oenensis* Wallnöfer 1992 does not occur in the type relevé selected by Balátová-Tuláčková et al. (1993).

4. Braun-Blanquet (1949) published on p. 311 the new alliance '*Sedo-Scleranthion*' with two associations, namely the '*Sclerantho-Sempervivetum arachnoidei* Br.-Bl. *nom. nova*' and the '*Sedetum montani ass. nova*', the latter being a *nomen nudum*. As far as the '*Sclerantho-Sempervivetum*' [recte: *Sclerantho-Sempervivetum*] is concerned, there is a bibliographical reference to "Chodat und Anand (1936) p. 268–273" where there are the two associations '*Sempervivetum arachnoidei*' and '*Festucetum ovinae*' with published relevés containing both name-giving taxa *Scleranthus annuus* L. 1753 and *Sempervivum arachnoideum* L. 1753. Although the name '*Sclerantho-Sempervivetum arachnoidei*' is a *nomen superfluum* (Art. 29), the name '*Sedo-Scleranthion*' is validly published. However, since the bibliographical references were published later, in the last part of the paper 'Übersicht der Pflanzengesellschaft Rätians (VI)' – in Braun-Blanquet (1950) –, the pertinent publication date is not 1949 but 1950.

Recommendation 6A

A newly published name should be indicated as new in only a single publication.

Article 7 – Original diagnosis of an association or subassociation

The original diagnosis of an association or subassociation is sufficient, in the sense of Art. 2b, only if it contains at least one effectively published vegetation relevé (see Art. 1), i.e. a list of scientific names of plant species or infraspecific taxa from a sample plot with a quantitative indication of their occurrence in a sampling scale consisting of at least three states.

For names published before 1 January 1979, a synoptic table based on at least three relevés and containing at least species with a constancy above 20% given in a sampling scale containing at least three states of constancy, or containing an indication of mean cover values, is also considered a sufficient original diagnosis. A table containing at least three relevés with presence-absence indication is also considered a sufficient original diagnosis, equivalent to a synoptic table based on three relevés (see Note 1).

An erroneous indication to the simultaneously published relevés (e.g. in giving a wrong table number in the text) has no effect on the original diagnosis of a name as far as the relevés that do correspond to the name can be identified in another way beyond

any doubt. On the contrary, the reference to a partial table with no precise indication of the relevés taken into consideration is not considered as sufficient diagnosis even if claims such as "most of the relevés", "*pro maxima parte*", "zum grössten Teil" would suggest that almost all the relevés were included.

Note 1: The quantitative indication of the occurrence of species in vegetation relevés can be either expressed in projected cover, frequency, abundance and the like, as long as they are presented in a scale containing at least three states. The scale of three degrees can occur in the form of semi-qualitative states such as *very common*, *common*, *least common*, *rare*, *very rare* or *dominant*, *frequent*, *occasional*, *rare*, *very rare*.

Note 2: Synonyms that are mentioned with an unambiguous reference in the first, valid description of a name are elements belonging to the original diagnosis of that name (see Arts. 2b, Note 1; Art. 29c).

Examples

1. The name '*Bunio microcarpae-Festucetum pinifoli*' is not validly published in Hüseyinova & Yalçın (2018, p. 154) because the relevés of the original diagnosis are not effectively published according to Art. 1 as they occur only in the online supplement (<https://hrcak.srce.hr/206295>).
2. The original diagnosis of the '*Juncetum filiformis* Tx. 1937' published in Tüxen (1937, p. 93) is sufficient although the accompanying species showing a constancy below 20% are not given in the synoptic table.
3. The name '*Polygalo chamaebuxi-Piceetum*' on pp. 726–727 in Ellenberg & Klötzli (1972) [*recte*: 1974] is based on nine unpublished relevés. Although there is a differentiated information in five classes about the dominance of the species in the separate synthetic table, the name is invalidly published because there are only two classes of frequency ($\geq 50\%$ and $< 50\%$).
4. The four names '*Luzulo-Nardetum*', '*Hypochaerido-Potentilletum calabrae*', '*Foeniculo-Festucetum spadiceae*' and '*Astragaletum calabri*' published in Giacomini & Gentile (1966, p. 137) are not validly published because even if the synoptic relevés given in the table 1 contain the diagnostic species of the associations and alliances, most of the species with a frequency higher than 20% are missing.
5. The name '*Juniperion brevifoliae*' is validly published in Sjögren (1973, p. 26) with the original diagnosis containing three associations ('*Anagallidetum tenellae*', '*Erico-Myrsinetum*', '*Festucetum jubatae*') that are each validly published with a table of several relevés with a presence-absence indication of species quantity.

6. The name '*Quercetum sessiliflorae*' published on pp. 123–130 by Moss in Tansley (1911) is validly published with two synthetic tables (pp. 128 and 139) where the occurrence of species is given in a scale of six degrees (d: dominant, a: abundant, f: frequent, o: occasional, r: rare, vr: very rare).

7. The name '*Nymphaeo loti-Limnophytonetum obtusifolii*' in Müller & Deil (2005, pp. 348, 387) is validly published on basis of its type relevé for which the quantitative indication occurrence of the plant species is given in a scale of four degrees (abundant, numerous, frequent, occasional).

8. The original diagnosis of the new association '*Vicio cassubicae-Quercetum cerris*' in Brullo & Marcenò (1985, p. 205) is referred on p. 205 to table 16 that corresponds to the association '*Quercetum gussonei*'. Since on p. 205 the authors refer also the '*Quercetum gussonei*' to the same table 16, and due to the existence of a table 17 with the heading "*Vicio cassubicae-Quercetum cerris*", there is no doubt which table corresponds to the name '*Vicio cassubicae-Quercetum cerris*' that is validly published despite the erroneous reference to table 16.

9. The original diagnosis of the name '*Melico-Piceetum*' on pp. 728–729 in Ellenberg & Klötzli (1972) [recte: 1974] is based on 22 relevés as indicated by the authors in the "Material". In the synonymy, the authors indicate the association: '*Piceetum montanum melicetosum* (Braun-Blanquet, Pallmann und Bach 54, T. 10 z. gr. T.)' i.e. to "most of the relevés of the table 10". Although table 10 in Braun-Blanquet, Pallmann & Bach (1954) contains 24 relevés and Ellenberg & Klötzli retained 22 relevés of it, the name '*Melico-Piceetum*' is not validly published.

Recommendation 7A

The original diagnosis of an association or subassociation should contain at least 10 vegetation relevés made in different localities, together with the exact details of the locality, the size of the sample plot and the date of each relevé, and as much ecological and geographical information as possible. For the quantitative indication on the occurrence of the species, it is recommended to use cover or cover-related scales, or those measures of abundance the most appropriate for the type of communities studied.

Authors are advised to provide the full names (unabbreviated) of the taxa in a table of relevés to avoid any confusion.

Recommendation 7B

In the original diagnosis, the authors of the species and the infraspecific taxa should be indicated directly or indirectly (by means of reference to a Flora, either published or online) or at least the name-giving taxa should be provided with the authors.

Recommendation 7C

Even the rare taxa in a table should always be published to have complete relevés.

Recommendation 7D

In publications not written in English, authors are invited to provide also the original diagnosis in English, for instance in form of an appendix.

Article 8 – Original diagnosis of syntaxa above the association rank

The original diagnosis of a syntaxon at ranks higher than association is sufficient in the sense of Art. 2b, only if it contains the valid publication of the name of at least one syntaxon of the next subordinate principal rank assigned to it or an unambiguous reference (see Art. 2b) to at least one such validly published name.

On or after 1 January 1980, the original diagnosis is sufficient only when the specific or infraspecific character and/or differential taxa are also explicitly indicated, and when at least one of these diagnostic taxa is present in the relevés of the original diagnoses of one of the associations belonging, as subordinate syntaxa, to the original diagnosis (see Art. 3f).

For syntaxa above the rank of association that contained only a single syntaxon of the next subordinate principal rank when published, the specific or infraspecific character and/or differential taxa of the subordinate syntaxon are to be considered character and/or differential taxa of the syntaxon above the association rank, when no such taxa are indicated in the latter.

Note 1: The indication of 'diagnostic' species (or infraspecific taxa) instead of character and/or differential species is also accepted as a sufficient diagnosis.

Note 2: Synonyms that are mentioned with an unambiguous reference in the first, valid description of a name are elements belonging to the original diagnosis of that name (see Art. 2b, Note 1, and Art. 29c).

Examples

1. The original diagnosis of the name '*Brometalia erecti*' in Koch (1926, p. 20) is sufficient since it contains the valid publication on p. 121 of the name of the subordinated alliance '*Bromion erecti*'. This name is itself validly published since the association '*Mesobrometum erecti*' assigned to the alliance is validly published on p. 121 with a sufficient original diagnosis.

2. The name '*Violo palustris-Lotion uliginosi*' in Passarge (1989b, p. 85) is not validly published despite the alliance contains only one association (designated as the type of the alliance name) – the '*Equiseto-Lotetum uliginosi* Passarge 1989' – as no character and/or differential species are explicitly indicated for the alliance nor for the association.

3. Golub & Saveljeva (1992, p. 421) described the new alliance '*Caricion stenophyllae*' with an indication of the diagnostic species; the name '*Caricion stenophyllae*' is thus validly published.

Recommendation 8A

In publications not written in English, authors are invited to provide also the original diagnosis in English, for instance in form of an appendix.

Article 9 – No automatic validation of names of syntaxa above the association rank

When the name of a syntaxon above the association rank is published invalidly since the name of the syntaxon cited of the next subordinate principal rank is itself not validly published, the validation of the latter does not automatically validate the name of the syntaxon above the association rank.

Chapter 3. Form of the names of syntaxa

Article 10 – Formation of names of syntaxa

a. The name of an association or of a syntaxon of a higher rank is formed from the validly published scientific name(s) (name-giving taxa) of one or two of the plant species or infraspecific taxa, or hybrids that are present in the original diagnosis (see Note 1, and Arts. 3f, 3p, and 34c). Generic names and specific or infraspecific epithets should be modified as follows.

For generic names, a definite termination (Arts. 11 and 41) is added to the stem to indicate the rank of the syntaxon (see Note 3 and Example 1). If the vowels 'a', 'e', 'o' and 'u' occur at the end of the stem of the generic name they are elided (see Example 3).

When a syntaxon is named after two plant taxa belonging to different genera, the termination indicating the rank is appended to the stem of the second generic name only, and a connecting vowel is appended to the stem of the first generic name (see Note 3).

The two generic names are linked by a hyphen (without space before and after it) (see Example 2). When both plant taxa belong to the same genus, then the generic name is used only once (see Example 4).

Specific or infraspecific epithets are put in the genitive if they are declinable (see Note 3 and Example 3). When an infraspecific taxon is used in the formation of a name (see Note 2) only the infraspecific epithet can be used (see Example 5 and Art. 34c).

When both plant taxa belong to the same genus, the two plant epithets follow the generic name one after the other. A connecting vowel is appended to the stem of the first epithet and the second epithet is in the genitive (see Example 4). The two epithets are linked by a hyphen (without space before and after it). 'O' is the normal connecting vowel used; 'i' is used only with true Latin words of the 3rd declension; the vowels 'a', 'e', 'o' and 'u' are elided if they occur at the end of the stem (see Note 3).

When the original form of the name of a syntaxon (see Def. V and Note 1) is orthographically incorrect according to the Rules, it has to be corrected (see Art. 41).

Note 1: The name-giving taxon (taxa) may be present either as a synonym(s) or at another rank in the original diagnosis (Def. V, Arts. 3f, 32, and 45).

Note 2: If an infraspecific taxon is indicated in the original diagnosis, the author(s) can choose between using either the specific or the infraspecific rank for the name-giving taxon (see also Art. 45). If not specified, the lowest rank indicated is the name-giving taxon. However, when the chosen infraspecific

name-giving taxon is not validly published this causes the invalidity of the name of the syntaxon (see Art. 31, Example 4). On the other hand, when no clear information is provided about the rank that is used as the name-giving taxon, then the name at the specific rank is used in case of invalidity of the name at the infraspecific rank. (See also Rec. 10F about the use of infraspecific taxa as name-giving taxa.)

When hybrids are used in the name of a syntaxon, only the epithet of the binary nothotaxon is used as the name-giving taxon, without the cross 'x' indicating the hybrid status. (See also Rec. 10F about the use of hybrids as name-giving taxa.)

Note 3: The forms of the genitive, the stems of the names of taxa and the correct connecting vowels are to be found in Appendix I.

Examples

1. The name '*Phragmitetalia*' (Koch, 1926, p. 20) is formed from the stem '*Phragmita*' of the generic name '*Phragmites*' (see Appendix I #49). The stem ends with the vowel 'a' that is elided to append the termination '-etalia' indicating the rank of order.

2. The name '*Crataego-Prunetea*' (Tüxen, 1962, p. 300) is formed from the two generic names '*Crataegus*' and '*Prunus*'. The connectig vowel 'o' is appended to the stem '*Crataeg-*' of the first genus, and the termination '-etea' indicating the rank of class is appended to the stem '*Prun-*' of the second genus (see Appendix I #76). The two names are linked together by a hyphen.

3. The name '*Festuco hystricis-Ononidetea striatae*' (Rivas-Martínez et al., 2002, p. 108) is formed from the two specific names '*Festuca hystrix* Boiss. 1838' and '*Ononis striata* Gouan 1773'. The stem of the generic name '*Festuca*' remaining '*Festuca*' (see Appendix I #1), the vowel 'a' is elided to add the connecting vowel 'o'. The stem of the generic name '*Ononis*' is '*Ononid-*' (see Appendix I #59) to which the termination '-etea' indicating the rank of class is appended. Both specific epithets '*hystrix*' and '*striata*' that are declinable occur in the genitive, '*hystricis*' and '*striatae*', respectively (see Appendix I #1 and 91).

4. The name '*Caricetum inflato-vesicariae*' (Koch, 1926, p. 63) is formed from the two specific names '*Carex inflata* auct. non Hudson 1762' [*recte: C. rostrata* Stokes 1787; see Art. 44, Example 8] and '*C. vesicaria* L. 1753'. The stem '*Caric-*' of the generic name '*Carex*' (see Appendix I #89), with the termination '-etum' indicating the rank of association, occurs only once, followed by the two specific epithets that are linked by a hyphen. The connecting vowel 'o' has been appended to the stem '*inflat-*' of the first epithet '*inflata*', and the second epithet '*vesicaria*' is in the genitive ('*vesicariae*') (see Appendix I #1).

5. Rivas Goday & Borja Carbonell (1961, p. 102) published the 'Asociación. — *Sideritis glacialis* et *Arenaria aggregata erinacea* [,] *Sideriteto-Arenarietum erinaceae*'. In the relevés of the original diagnosis of the association (table 14) both name-giving taxa are indicated at the infraspecific level, respectively '*Sideritis glacialis* Boiss. var. *pulvinata* F. Q.' and '*Arenaria aggregata* (L.) Lois. ssp. *erinacea* (Boiss.) F. Q. var. *microphylla* Pau'. Although the authors used the invalidly published varietal name '*Sideritis glacialis* var. *pulvinata* Pau' (*nomen nudum*), they choose the specific rank as the name-giving taxon, not the invalid variety. In the same way, although the authors give the variety '*microphylla*' in the relevés for the second name-giving taxon, they choose the subspecific rank as the name-giving taxon (*Arenaria aggregata* subsp. *erinacea* (Boiss.) Font Quer 1948). Therefore, only the subspecific epithet '*erinacea*' is to be used in the association name *Sideritido glacialis-Arenarietum erinaceae* that is validly published.

6. The name '*Scirpeto-Phragmitetum*' in Koch (1926, p. 45) [*recte: Scirpo-Phragmitetum*] has been validly published in using the name-giving taxon *Scirpus lacustris* L. 1753 instead of *Schoenoplectus lacustris* (L.) Palla 1888 that is mentioned in the original diagnosis on p. 47 (see Rec. 10A).

b. When the name of a syntaxon is formed from the names of two taxa of which only one belongs to the highest of the dominant strata determining the vertical structure, then the name of that taxon appears on the second place. Names that do not follow this rule are legitimate, however must be inverted according to Art. 42.

When the name of an association is formed from names of two taxa of which both belong to the highest stratum determining the vertical structure, then the name of the taxon with the highest cover value appears on the second place. Names that do not follow this rule are legitimate, however must be inverted according to Art. 42.

Note 1: The assessment of the dominance of stratum is found under Art. 29b.

Examples

1. The following names are formed in the sense of this article: '*Cerastio arvensis-Agrostetum pusillae*' [*recte: 'Cerastio arvensis-Agrostietum pusillae'*] published by Moravec (1967, p. 149), '*Carici pilosae-Fagetum*' published by Oberdorfer (1957, p. 462), and '*Luzulo-Fagion*' published by Lohmeyer & Tüxen in Tüxen (1954, p. 460).

2. Contrarily, the following names are not formed in the sense of this article (they are legitimate but they must be inverted according to Art. 42): '*Calluneto-Genistetum*' [*recte: 'Genisto-Callunetum* Tüxen 1937 *nom. invers.*']; see Art. 42, Example 2] published by Tüxen (1937, p. 117) and '*Quercus*

sessiliflora-Lithospermum purpureo-coeruleum- Ass.' [recte: *Lithospermo purpurocaerulei-Quercetum petraeae* Braun-Blanquet 1929 *nom. invers. et corr.*]; see Art. 42, Example 1; Art. 44, Example 3] published by Braun-Blanquet (1929, p. 51).

Recommendation 10A

Authors are requested to use name-giving taxa fully in accordance with the International Code of Nomenclature for algae, fungi, and plants to avoid publishing unnecessary inadequate names (*nomina inepta*) (see Arts. 44 and 45). In this respect, authors are requested to indicate in the original diagnosis the taxonomic reference (e.g. Flora or checklist, either published or on-line) they follow for the name-giving taxa, or at least to provide the name-giving taxa with the authors.

When the name of a taxon from which the name of a syntaxon is formed is not the same as that applied in the original diagnosis then it should be cited in the original publication of the name of the syntaxon as a synonym of the taxon in question.

Recommendation 10B

The name of a syntaxon should be formed from such taxa (taxon) that are characteristic or differential of the syntaxon in question.

Recommendation 10C

To avoid misunderstanding, the name of the syntaxon should be completed by adding, in the genitive, the specific or infraspecific epithet of the name of the taxon, provided that it is clear from which name of a taxon (or of taxa) it is formed (see Art. 31, Note 2, and Art. 40a, Note 1).

Recommendation 10D

It is recommended to use the stem *Potamogeton-* but the use of the abbreviated form *Potam-* is also accepted.

Recommendation 10E

In the case of weedy plant communities in crops, the cultivated crop species have been traditionally excluded from the sampling of the plant communities. Therefore, it is not recommended to use the cultivated crop species as name-giving taxa although they may belong to the highest stratum determining the vertical structure.

Recommendation 10F

It is not recommended to use infraspecific taxa below the subspecies rank as name-giving taxa since they are often not treated in floras.

It is also not recommended to use hybrids as name-giving taxa since the concept of hybrid is problematic, and their distinction may be debatable.

Article 11 – Rank-indicating terminations

The terminations indicating rank are:

Rank	Termination
Association	<i>-etum</i>
Alliance	<i>-ion</i>
Order	<i>-etalia</i>
Class	<i>-etea</i>
Subassociation (see Art. 13)	<i>-etosum</i>
Suballiance	<i>-enion</i>
Suborder	<i>-enalia</i>
Subclass	<i>-enea</i>

Note 1: Originally the terminations *-inea* or *-etales* were used for class names. The application of these terminations before 1 January 1979 does not imply the invalid publication of such class names according to Art. 3e; the termination must be corrected to the regular form according to Art. 41b.

Example 1

The name '*Molinieto-Arrhenatheretales*' in Tüxen (1937, p. 73) is validly published, however must be corrected to the regular form '*Molinio-Arrhenatheretea*' according to Art. 41b.

Article 12 – Compound names of syntaxa

Before 1 January 1979, compound names containing a prefix that expresses certain morphological or ecological characteristics are permissible as correct, as well as are those compound names using the prefix *Eu-* for secondary ranks. Prefixes are written according to their original form (Art. 40a). As an exception, '*Rudereto-*' is to be orthographically corrected to '*Ruderali-*'.

On or after 1 January 1979, names formed in this way are not validly published (see Art. 3h), except for autonyms of ranks higher than association composed with the prefix *Eu-* (see Art. 24b).

Note 1: Ecological and morphological prefixes are not linked by a hyphen to the generic name that they characterise unless the hyphen was used in the original diagnoses (see Examples 1 through 4). In the autonyms above the association rank, the prefix '*Eu*' is written with a hyphen.

Examples

1. The following names in Koch (1926) are validly published although they contain a prefix with a morphological characteristic since the date of the name is earlier than 1 January 1979:

'*Parvopotameto-Zannichellietum tenuis*' [*recte: 'Parvopotamogetono-Zannichellietum tenuis'*] on p. 35, '*Nanocyperion flavescens*' on p. 21, and '*Magnocaricion elatae*' on p. 55.

2. The following names are validly published although they contain a prefix with an ecological characteristic since the date of the name is earlier than 1 January 1979: '*Thero-Salicornion*' (Braun-Blanquet, 1933, p. 12) and '*Seslerio-Xerobromenion*' (Oberdorfer, 1957, p. 275 in the form 'Unterverband *Seslerio-Xerobromion*').

3. The name '*Eu-Vaccinio-Piceenion*' is validly published in Oberdorfer (1957, p. 377) in the form 'Unterverband *Eu-Vaccinio-Piceion*' although it is a compound name with '*Eu-*' since the date of the name is earlier than 1 January 1979 (see also Art. 24b, Example 1).

4. The name '*Rudereto-Secalinetales* Br.-Bl. 1936' [*recte: Ruderali-Secalietae*] in Braun-Blanquet, Gajewski, Wraber & Walas (1936, p. 3) is invalidly published not because it contains a prefix with the

ecological characteristic '*Rudereto*' but because no species of the genus *Secale* L. 1753 occurs in the original diagnosis (Art. 3f).

Article 13 – Names of subassociations

a. The name of a subassociation consists of the association name followed by the subassociation epithet (see Def. VII). The epithet is formed either from the validly published scientific name of a species or of an infraspecific taxon occurring in the original diagnosis of this subassociation (Art. 10a; see also Arts. 3p and 34c), or else it is represented by the adjective '*typicum*' or '*inops*'. When the subassociation epithet is formed, the termination '*-etosum*' (Art. 11) indicating the subassociation rank is added to the stem of the generic name (see Example 1). If the vowels '*a*', '*e*', '*o*' and '*u*' occur at the end of the stem then they are elided (see Note 1). The specific or infraspecific epithet is in the genitive if it is declinable (see Note 1 and Art. 10a).

Subassociation epithets that are derived from morphological, ecological, geographical or other characteristics (e.g. '*normale*') are illegitimate (see Art. 34a) if they were published before 1 January 1979, and invalid when they have been published later (Arts. 3h, 4c, and 4e).

Note 1: The stems of the names of taxa, the forms of the genitive, and the correct connecting vowels are to be found in Appendix I.

Example 1

Koch (1926, pp. 67–75) divided the '*Schoenetum nigricantis*' in three subassociations, among them the '*typicum*' and the '*schoenetosum ferruginei*'. The second subassociation epithet '*schoenetosum ferruginei*' is formed from the stem '*Schoen-*' of the generic name '*Schoenus*' (see Appendix I # 73), to which the termination '*-etosum*' has been added, and the genitive '*ferruginei*' of the specific epithet '*ferrugineum*' (see Appendix 1 # 15).

b. The subassociation that includes the type of the name of the association must automatically get the epithet '*typicum*' not followed by an author citation. Such names are autonyms (see also Arts. 4d, 5b and 26).

Recommendation 13A

When a subassociation epithet containing the type of the association is superseded by the subassociation *typicum*, it is recommended to indicate at least once in a work the superseded epithet, and to place it in the synonymy of the subassociation *typicum*.

When publishing a name of a subassociation that will establish automatically the subassociation *typicum* (autonym) because the association has not been yet divided in subassociations, the subassociation *typicum* should be mentioned in the publication.

Article 14 – Correction of form of validly published names

a. Before 1 January 1979, those names of syntaxa are validly published that are formed from one or two scientific plant names (Arts. 10a and 13a) with no termination indicating the rank (Art. 11), provided that a clear indication of their rank is mentioned. Such names must, however, be corrected to the regular form (see Art. 41b).

On or after 1 January 1979, names of syntaxa formed as mentioned above are not validly published (see Art. 3h).

Examples

1. The name 'association à *Carex buxbaumii*' in ISSLER (1932, p. 444) is validly published but must be corrected to the regular form '*Caricetum buxbaumii* ISSLER 1932' according to Art. 41b.

2. The name '*Sparganium angustifolium-Sphagnum obesum*-Ass. Tüxen 1937' is validly published on p. 43 in Tüxen (1937) but must be corrected to the regular form '*Sphagno obesi-Sparganietum angustifolii* Tüxen 1937 *nom. invers.*' according to Arts. 41b and 42.

3. The name '*Ericetum tetralicis* Subass. v. *Succisa pratensis* Tx. 1937' is validly published on p. 112 in Tüxen (1937) but must be corrected to the regular form '*Ericetum tetralicis succisetosum pratensis* Tüxen 1937' according to Art. 41b.

4. The name 'sous-alliance à *Hypericum androsaemum*' in Vanden Berghen (1969, p. 115) is validly published, although it is an illegitimate name according to Art. 29b since it refers to a syntaxon of forest associations.

b. Those names of syntaxa are validly published before 1 January 1979 that are formed from specific epithets used without the generic name (see Art. 3h). When such a specific epithet is at the same time a generic name published validly up to the date of publication of the name of a syntaxon, then the name of the syntaxon must be retained in its original form (see also Art. 45).

Examples

1. The names '*Seslerieto-Semperviretum*' in Beger (1922, p. 112, '*Personato-Petasitetum*' in Oberdorfer (1957, p. 201), '*Rhodoreto-Vaccinietum mugetosum* Br.-Bl. 1939' in Braun-Blanquet, Sissingh & Vlieger (1939, p. 40) are validly published, but must be corrected in the sense of Art. 41b as the epithets '*sempervirens*', '*personata*', or '*mugo*' do not exist as generic names for the above species. The corrected names are '*Seslerio-Caricetum sempervirentis*', '*Carduo personatae-Petasitetum*', and '*Rhododendro-Vaccinietum pinetosum mugo*', respectively (see Art. 41b).
2. The name '*Periclymeno-Abietetum*' in Oberdorfer (1957, p. 498) must be retained in its original form since the specific epithet was validly published as a generic name (*Periclymenum* Miller 1754) before 1957.

Chapter 4. Typification of the names of syntaxa

Article 15 – Application of nomenclatural types

The application of the name of a syntaxon is determined by means of its nomenclatural type (the type of the name). The nomenclatural type is that element of the syntaxon with which its name is permanently attached when any syntaxonomic alteration takes place (uniting, division, alteration of position or of rank; see Arts. 24 through 28, Rec. 19A). It needs not necessarily be a particularly typical (characteristic) element of the syntaxon or one that is outstanding because of its frequency (see also Art. 53).

Article 16 – Types of association and subassociation names

The type of the name of an association or of a subassociation is an effectively published relevé (see Art. 7). This must not be further completed after its publication even if considered incomplete (see also Art. 37).

On or after 1 January 2002, the type relevé of the name of a new association must contain the name-giving taxon (taxa), otherwise the name is invalid. In the same way, the type relevé of the name of a new subassociation must contain the name-giving taxon of the subassociation epithet, otherwise the name is invalid (see Art. 5).

Example 1

The name '*Campanulo cochleariifoliae-Primuletum villosae*' in Juvan, Čarni & Jogan (2011, p. 145) is not validly published because *Primula villosa* (one of the name-giving taxa) is missing in the type relevé.

Article 17 – Types of names of syntaxa above the association rank

The type of the name of a syntaxon at ranks higher than association is a syntaxon of the next subordinate principal rank assigned to it and published with a valid name.

On or after 1 January 1979, the name of a new syntaxon at ranks higher than association is invalidly published if the name of the chosen type is invalidly published (see Art. 5).

On or after 1 January 2021, the name of a new syntaxon at ranks higher than association is invalidly published if the original diagnosis of the type does not contain the name-giving taxon (taxa) of that syntaxon name (see Art. 3f).

Note 1: An illegitimate name is nevertheless eligible as the type of a name (see Principle V, Note 1).

Example

1. The name '*Coremion*' [*recte: Coremation*] in Rothmaler (1943, p. 60) was validly published and legitimate although the original diagnosis of the alliance contains only the '*Coremetum vicentinum*' [*recte: Corematetum vicentinum*], a validly published name although illegitimate according to Art. 34a.

2. Passarge (1989b, p. 83) has chosen the alliance '*Thalictro-Filipendulion* de Foucault 1984' as the type of the name of the new suborder '*Lathyro-Filipendulenia*'. Since the alliance name had not been published effectively (according to Art. 1 – a thesis distributed as xerocopies only) and its publication is therefore invalid, the new suborder name is also invalidly published.

3. The name '*Murbeckiellion huetii*' in Onipchenko (2002a, p. 18) is invalidly published because the association '*Scrophulario variegatae-Epilobietum dodonaei*' in Onipchenko (2002a, pp. 18, 30) indicated as the type of the alliance is invalidly published. Both names were validly published in Onipchenko (2002b, p. 89).

Article 18 – Holotype

a. The holotype is an element of the original diagnosis indicated as the nomenclatural type by the author(s) (Def. VIII). Therefore, if it is not published simultaneously, it must be accompanied by an unambiguous reference to the effective publication (see Art. 2b, Note 3).

If the author(s) of the name of a syntaxon designated a relevé or a syntaxon of the next subordinate principal rank as the nomenclatural type, or if the original diagnosis of a syntaxon contained only a single relevé or only a single such syntaxon, then it must be accepted as the holotype (see also Art. 21).

On or after 1 January 2021, the page and/or the number of the table must be given. Even when only one suitable element for the type occurs this element must be designated explicitly as the nomenclatural type with the Latin word '*typus*' (see Art. 5).

Examples

1. For the name '*Caloplacetum phloginae*' in Barkman (1958, p. 369) the author has designated relevé 1 in table 29 as the nomenclatural type; this relevé is the holotype of the above name.

2. In the original diagnosis of the order '*Molinieta lia caeruleae*' in Koch (1926, p. 20), the '*Molinion caeruleae*' published on pp. 97–120 in Koch (1926) was incorporated as the sole alliance; the '*Molinion caeruleae* Koch 1926' is, therefore, the holotype of the name '*Molinieta lia caeruleae* Koch 1926'.

3. Rivas-Martínez, Díaz & Fernández-González (1990, p. 129) have designated the association '*Coremetum vicentinum* Rothmaler 1954' [*recte*: *Corematetum vicentinum* Rothmaler 1943] as lectotype of the name '*Coremion albi* Rothmaler 1954' [*recte*: *Coremation* Rothmaler 1943]. This lectotypification is superfluous since the '*Corematetum vicentinum*' represents the only element published with the valid name in the original diagnosis of the alliance and must therefore be accepted as the holotype.

4. Nezdal (1989, p. 93) has typified the name '*Roemerio hybridae-Hypecoetum penduli* Br.-Bl. et de Bolòs (1954) 1957 em. Nezdal' [recte: *Roemerio-Hypecoetum* Braun-Blanquet et O. de Bolòs 1954] by means of a neotype chosen by himself. This typification is superfluous as the original diagnosis of the association contains only one relevé that must be accepted as the holotype.

b. A superfluous name (*nomen superfluum*) gets automatically the type of the earliest legitimate name included (see Art. 29c).

Article 19 – Choice of a lectotype

a. When before 1 January 1979 the original diagnosis of a syntaxon contains several elements (relevés or syntaxa of the next subordinate principal rank), indicated either directly or by an unambiguous reference, and the author did not designate the nomenclatural type of the name, then one of the above elements is to be chosen as lectotype (see also Art. 20). For associations and subassociations, relevés such as 'not typical', 'fragmentary', 'transitional' or of some other form that, in the author's opinion, do not correspond exactly to the named syntaxon should not be selected for a lectotype. When no other relevés are available then see Art. 21.

When before 1 January 1979 an association was divided into subassociations as early as in the original publication and when one of them was named with the epithet '*typicum*' or as a 'typical subassociation' by the author, then one vegetation relevé belonging to the original diagnosis of this subassociation must be chosen as lectotype both for the association name and for the name of this subassociation.

The first effectively published choice of a lectotype must be followed unless it is contrary to any other rule.

On or after 1 January 2002 the choice of the lectotype must be accompanied by an unambiguous reference to the effective publication of the element chosen for lectotypification.

On or after 1 January 2021, the choice of a lectotype must be designated with the Latin expression '*lectotypus hoc loco*' and the page and/or the number of the table of the lectotype must be given.

Examples

1. The name '*Festuco-Sedetalia acris*' in Tüxen (1951, p. 163) was published accompanied by an original diagnosis containing four alliances, yet without the designation of a nomenclatural type. Moravec (1967, p. 163) chose the '*Helichryson arenarii* Tüxen 1951' as the lectotype. This choice must be followed.

2. Vicherek (1971, p. 139) described the '*Centaureo odessanae-Elymetum gigantei*' as a new association with four subassociations of which one has the epithet '*typicum*'. Since the author did not designate the nomenclatural type of the association name, the lectotype must be chosen from the relevés of the subassociation '*Centaureo odessanae-Elymetum gigantei typicum*' that becomes the autonym (see Art. 13b).

3. Englisch (1999, p. 165) typified the alliance '*Arabidion caeruleae* Braun-Blanquet in Braun-Blanquet et Jenny 1926' with the association '*Arabidetum caeruleae* Braun-Blanquet 1918'. In Braun-Blanquet & Jenny (1926, p. 198–205) the '*Arabidion caeruleae*' [recte: '*Arabidion caeruleae*'] includes two associations, namely the '*Arabidetum caeruleae*' [recte: '*Arabidetum caeruleae*'] on p. 199 and '*Salicetum retusae-reticulatae*' [recte: '*Salicetum retuso-reticulatae*'] on p. 203. Since there is no reference to Braun-Blanquet (1918) in the original diagnosis of the alliance and the '*Arabidetum caeruleae*' is without author citation, the latter name is a later homonym (Art. 31) of the earlier '*Arabidetum caeruleae*' published by Braun-Blanquet (1918, p. 61). Therefore, the '*Arabidetum caeruleae* Braun-Blanquet 1918' cannot be the type of the alliance as designated by Englisch (1999) and it must be superseded by the illegitimate '*Arabidetum caeruleae* Braun-Blanquet in Braun-Blanquet et Jenny 1926'. Since most of the relevés of the latter association do not fit the syntaxonomic concept of the '*Arabidetum caeruleae* Braun-Blanquet 1918' which is based on a single relevé, Béguin & Theurillat (2015, p. 28) typified the '*Arabidetum caeruleae* Braun-Blanquet in Braun-Blanquet et Jenny 1926' in the sense of the '*Arabidetum caeruleae* Braun-Blanquet 1918' in order to avoid any confusion in the interpretation of the '*Arabidion caeruleae*'.

b. [deleted]

c. A lectotypification is not effective when the element chosen for the type is not effectively published, invalid or contrary to the rules. A lectotypification is superfluous when a legitimate type exists already (Arts. 18 and 20) or when it applies to an unpublished name or an invalid name.

Examples

1. Mucina (1987, p. 2) has chosen a lectotype for the name '*Malvetum neglectae*'. This typification is superfluous and must be superseded since Eliáš (1981, p. 338) had typified this name earlier.

2. Dengler et al. (2012, p. 348) choose the name '*Stipion lessingianae* Soó 1947' as the lectotype of the name '*Festucetalia valesiaca* Soó 1947' [recte: '*Festucetalia valesiaca* Soó (1940) 1947']. However, the '*Festucetalia valesiaca* Soó 1947' is a superfluous name (Art. 29c) for the '*Festucetalia* Soó 1940' because Soó (1947, p. 22) explicitly refers to Soó (1940) with the unambiguous, abbreviated reference "N. A" which means *Nova Acta Leopoldina*, as explained on p. 47. Therefore, since the later name '*Stipion lessingianae* Soó 1947' does not belong to the original diagnosis in Soó (1940), it cannot be the type of the '*Festucetalia valesiaca* Soó (1940) 1947', and the lectotypification by Dengler et al. (2012) must be superseded. Terzi, Di Pietro & Theurillat (2016, p. 310) selected the name '*Festucion sulcatae* Soó 1930' as the lectotype of the name '*Festucetalia* Soó 1940', and thus the '*Festucion sulcatae* Soó 1930' is implicitly the type of the '*Festucetalia valesiaca* Soó (1940) 1947' (Art. 18b).

3. Quézel, Barbero & Akman ("1992" [recte: 1993]) selected on p. 82 the name '*Silenion auriculatae* Quézel 1964' as the type of the '*Potentilletalia speciosae* Quézel 1964'. The '*Silenion auriculatae*' being the unique alliance of the order, it is automatically the holotype (Art. 18) and the lectotypification is superfluous.

4. Quézel, Barbero & Akman ("1992" [recte: 1993]), selected on p. 82 the name '*Astragalo-Brometalia* Quézel 1973' as the type of the '*Astragalo-Brometea* Quézel 1973'. However, the lectotypification is superfluous because the name '*Astragalo-Brometalia*' being identical, except for the ending, to the name of the class, it is automatically the type as no other choice has been made (Art. 20).

Recommendation 19A

When one or more elements of a syntaxon have already been transferred to other syntaxa through division or emendation, the lectotype should be chosen from the remaining elements, suitable for typification, to preserve the current usage of the name.

Recommendation 19B

When selecting the lectotype of the name of an association or of a subassociation (Art. 19), or the neotype (Art. 21), authors are recommended to select an element containing the name-giving taxon (taxa) among those appropriate elements.

Article 20 – Lectotypification of names of syntaxa above the association rank based on the same taxon names

For names of syntaxa at ranks higher than association, there is a limitation in the designation of the lectotype in accordance with Art. 19. When the original diagnosis of the higher syntaxon contains a next subordinate syntaxon whose name is formed of the same name-giving taxa, no matter of the order sequence, then that subordinate syntaxon becomes automatically the type. However, this does not apply to superfluous names (see Art. 18b).

Examples

1. The order '*Phragmitetalia*' in Koch (1926, p. 20) contains two alliances validly published in the original diagnosis, namely '*Phragmition*' on p. 45 and '*Magnocaricion*' on p. 55. Since Koch did not designate the holotype, the '*Phragmition communis* Koch 1926' is therefore the type of the name '*Phragmitetalia* Koch 1926', the two names being identical except for the ending.

2. The name '*Astragalo-Brometea*' is validly published in Quézel (1973, p. 165) and its original diagnosis contains the valid orders '*Drabo-Androsacetalia*' and '*Astragalo-Brometalia*'. Since Quézel did not designate a holotype for the class, the order '*Astragalo-Brometalia* Quézel 1973' is therefore the type of the name '*Astragalo-Brometea* Quézel 1973' because, except for the ending, its name is identical to the name of the class.

Article 21 – Neotypes of association or subassociation names

When before 1 January 1979 the original diagnosis of an association or subassociation contains only a synoptic table but no single relevé or a reference to an effectively published single relevé, then a neotype (see Def. VIII) must be established. The same applies when the original diagnosis is a table of at least three relevés where the quantitative information is given on a scale of less than three degrees (see Art. 7), or when the only single relevés occurring in the original diagnosis are considered atypical by the author(s) (see Art. 19a).

When before 1 January 1979 an association was divided into subassociations as early as in the original publication and when one of them was named with the epithet '*typicum*' or as a 'typical subassociation' by the author, then the established neotype must

be a vegetation relevé which corresponds syntaxonomically to the subassociation *typicum* or the 'typical subassociation' (see also Art. 53).

The first establishment of a neotype must be followed, unless it can be shown that it was based on a misinterpretation of the original diagnosis.

On or after 1 January 2002, if the element serving as neotype is not simultaneously published for the first time, the establishment must be accompanied by an unambiguous reference to the effective publication of this element.

On or after 1 January 2021, the establishment of a neotype must be designated with the Latin expression '*neotypus hoc loco*' and the page and/or the number of the table of the neotype must be given.

Examples

1. The name '*Carici pilosae-Fagetum*' is validly published in Oberdorfer (1957, p. 462) with a synoptic table based on nine relevés, of which six are unpublished relevés of Oberdorfer. Willner (2002, p. 380) published for the first time one of Oberdorfer's relevé, provided by the author himself, and simultaneously established that relevé the neotype of the '*Carici pilosae-Fagetum*'.

2. The name '*Stellario-Carpinetum*' is validly published in Oberdorfer (1957, p. 421) with six subassociations, one of these being the subassociation *typicum*. The original diagnoses of the subassociations are synoptic tables based on unpublished relevés of Oberdorfer. However, Oberdorfer refers also the subassociations *typicum* and '*agrostidetosum*' [*recte*: '*agrostietosum*'] to not effectively published relevés of Knapp (1946) from a nearby region. Since the original relevés of Oberdorfer are not available, Novák (2019, p. 410) established one of Knapp's relevé the neotype of the '*Stellario-Carpinetum*' in publishing that relevé simultaneously. The established neotype must be followed unless it can be shown that it does not correspond syntaxonomically to the subassociation *typicum*.

Recommendation 21A

When possible, one of the unpublished relevés that the author of a name used in preparing the synoptic table should be published and designated as the neotype. Should such a relevé not be available, the neotype should as far as possible be a relevé taken from the same geographical area as the relevés of the synoptic table.

Chapter 5. Priority

Article 22 – Correct name of a syntaxon

Each syntaxon with a particular circumscription, position and rank has only one correct name, namely the earliest validly published one that is in accordance with the rules (Def. VI, Principle III and Principle IV, Note 1; see also Art. 23). Alternative names have no priority between them (Art. 30). Alternative forms of the name (Art. 45) can be used instead of the correct name.

In order to avoid unnecessary changes of generally used names of syntaxa owing to the rigid application of the priority rule, some names can exceptionally be protected as '*nomina conservanda*' (see Def. XIII and Art. 52).

Article 23 – Dates of valid publication in priority

In disputes about the priority of a name, the date of its valid publication is crucial (see Arts. 2 and 6).

Note 1: There is no priority between names of the same year that are published in the same publication or parts of the same publication (see Art. 1, Note 2).

Example 1

The name '*Cinerario maritimae-Artemisietum arborescentis*' in Géhu, Biondi & Géhu-Franck (1986, p. 81) is validly published. However, the same name has been published another time as new by the same authors two years later (Géhu, Biondi & Géhu-Franck, 1988, p. 239) for the same syntaxon. The earliest, validly published name '*Cinerario maritimae-Artemisietum arborescentis* Géhu, Biondi et Géhu-Franck 1986' is the correct name although it is published in an abstract book.

Chapter 6. Retention and choice of names and epithets when syntaxonomic changes occur

Article 24 – Division of syntaxa

a. Division of a syntaxon into syntaxa of the same rank: When a syntaxon is divided into two or more syntaxa without alteration of rank, one of these syntaxa must retain the original name, namely that to which the type of the name belongs (see Art. 3m). If the original name has not been retained or if it has been retained in an altered sense when the division was made, it must be re-introduced for the syntaxon that contains the type. The retention or re-introduction of a name is forbidden when Art. 36 applies.

Example 1

Pignatti (1953, pp. 91–98) divided the order '*Phragmitetalia* Koch 1926' into three orders, namely '*Nasturtio-Glycerietalia*', '*Phragmitetalia*' and '*Magnocaricetalia*'. He rightly retained the name '*Phragmitetalia*' for that part of the original order that contains the type alliance '*Phragmiton* Koch 1926'.

b. Division of a syntaxon at ranks higher than association into syntaxa of secondary ranks.

When a syntaxon of principal rank is divided into two or more syntaxa of secondary rank, a syntaxon of secondary rank whose name contains the type of the syntaxon at the principal rank (autonym) is automatically created. The name of the autonym is formed by altering only the rank-indicating termination, with the addition of the prefix *Eu-* (hyphen included), without being followed by an author citation. The autonym has no priority outside of the alliance, order or class it pertains, and it cannot be subordinated to another alliance, order or class name, respectively.

Before 1 January 1979, those validly published names that were not formed by altering only the rank-indicating termination are legitimate but must be superseded by the autonym. Such names published on or after 1 January 1979 are invalidly published (Art. 3m but see Art. 3h for exceptions).

On or after 1 January 1979 until 31 December 2020, those names formed by altering only the rank-indicating termination are legitimate but must be superseded by the autonym.

On or after 1 January 2021, those names that are not in accordance with this rule are invalidly published (Art. 3m).

Note 1: The name and the author citation of a syntaxon of secondary rank whose name contains the type of the name of the syntaxon at the principal rank have been handled diversely throughout the editions of the Code. The editions 1 and 2 stipulated (Art. 28) that, when a syntaxon of principal rank above the association is incorporated within another syntaxon of principal rank not already subdivided in secondary ranks, a syntaxon of secondary rank whose name contains the type of the name of the syntaxon at the principal rank, is automatically created. Further, that, on or after 1 January 1979, the name of this syntaxon of secondary rank must be formed only by altering the rank-indicating termination, without giving the author citation. However, no information was given on how to handle names of syntaxa of secondary rank created before 1 January 1979 that do not follow this rule, and the division of a syntaxon of principal rank into syntaxa of secondary ranks was not considered.

Recognising this incoherency, the 3rd edition of the ICPN abandoned the automatic creation of a syntaxon of secondary rank whose name contains the type of the name of the syntaxon at the principal rank and stipulated (Art. 28) that such a syntaxon of secondary rank could be created in a later step. Recognizing also that, when the name of a syntaxon of secondary rank is considered in isolation, it is not possible to identify if it contains the type of the name of the syntaxon at the principal rank, the 3rd edition of the ICPN introduced an author citation for that name to be able to trace its origin.

Note 2: The division of a syntaxon of principal rank into syntaxa of secondary rank corresponds to the description and denomination of new syntaxa (see Def. XIII).

Examples

1: The alliance '*Vaccinio-Piceion* Br.-Bl. 1938' in Braun-Blanquet et al. (1939, p. 4) contains four suballiances in its original diagnosis, among which the '*Unterverband Rhodoreto-Vaccinien* Br.-Bl. 1926' [*recte: Rhododendro-Vaccinien* Braun-Blanquet in Braun-Blanquet, Sissingh et Vlieger 1939]. Berg and Clausnitzer in Dengler et al. (2004, p. 380) selected as a lectotype of the alliance the '*Piceetum subalpinum* Braun-Blanquet in Braun-Blanquet, Sissingh et Vlieger 1939'. This association belongs to the suballiance '*Rhododendro-Vaccinien*' in Braun-Blanquet et al. (1939). Since the latter suballiance contains the type of the alliance, it must be superseded by the autonym of the alliance, namely the '*Eu-Vaccinio-Piceenion*' without an author citation. The original diagnosis of the legitimate, earlier name '*Eu-Vaccinio-Piceenion*' in Oberdorfer (1957, p. 377) (see Art. 12, Example 3) includes the '*Piceetum subalpinum* Br.-Bl. 38' on p. 380 [*recte: Piceetum subalpinum* Braun-Blanquet in Braun-Blanquet, Sissingh et Vlieger 1939]. Therefore, the autonym of the '*Vaccinio-Piceion* Braun-Blanquet in Braun-Blanquet, Sissingh & Vlieger 1939' corresponds to the same syntaxon as Oberdorfer's suballiance. By definition the autonym has the priority within the alliance over the Oberdorfer's suballiance.

2. The validly published name '*Potentillenion caulescentis* Theurillat' in Theurillat, Aeschmann, Küpfer & Spichiger (1995, p. 204) contains the type of the alliance '*Potentillion caulescentis* Braun-Blanquet in

Braun-Blanquet et Jenny 1926'. The name '*Potentillenion caulescentis* Theurillat in Theurillat, Aeschmann, Küpfer & Spichiger 1995' must be superseded by the autonym '*Eu-Potentillenion caulescentis*' without an author citation.

3. Dierschke (1981, p. 320) proposed to divide the alliance '*Trisetum-Polygonion* Br.-Bl. et Tx. ex Marschall 1947' (see Art. 42, Example 1) in three regional suballiances, among which the '*Campanulo-Trisetum*' for the Alps and Jura, an invalid name not in accordance with Arts. 3g and 5. The name has been validly published later by Dierschke in Theurillat (1992c, p. 335) as '*Campanulo rhomboidalis-Trisetum flavescens*'. However, the association that was selected as the type, the '*Trisetum flavescens* Rüb. 1911', is implicitly the type of the alliance '*Trisetum-Polygonion*' (Art. 18a). Therefore, the name '*Campanulo rhomboidalis-Trisetum flavescens* Dierschke in Theurillat 1992' is invalid (Art. 3m) since on or after 1 January 1979, a suballiance name containing the type of the alliance must be formed by altering solely the rank-indicating termination of the alliance name (Art. 24b). Consequently, the suballiance containing the '*Trisetum flavescens* Rüb. 1911' is the autonym '*Eu-Trisetum-Polygonion*' without an author citation.

c. Division of an association into subassociations: this division corresponds to the description and denomination of new syntaxa (see also Art. 26).

Recommendation 24A

When a name at a secondary rank containing the type of the principal rank is superseded by the automatic autonym, it is recommended indicating at least once in a publication the superseded name and to place it in the synonymy of the autonym.

When publishing a name of a secondary rank that would establish automatically an autonym within the syntaxon at principal rank because the latter has not been yet divided in secondary ranks, the autonym should be mentioned in the publication.

Article 25 – Uniting syntaxa of the same rank

When two or more associations or higher syntaxa of the same rank are united, the earliest name of the original syntaxa must be retained for the resulting syntaxon. The formation of names by joining the original names is not permissible. Such names are superfluous names (see Art. 29c).

When two or more subassociations published under the same association name are united, the earliest epithet must be retained.

If the syntaxa that are united are names (in the case of subassociations epithets) of the same date or published in the same publication (Art. 23), then the author who first effectively published this uniting has the right to choose among one of these names to name the resulting syntaxon, respectively one of these epithets for subassociations. However, for associations and subassociations, there is the following limitation: names defined by (single) relevés take precedence over those accompanied merely by a synoptic table in the original diagnosis. Under such provisions, the first choice must be followed if one accepts this syntaxonomic viewpoint.

Examples

1. Barkman (1958, p. 551) united the validly published '*Anomodonto-Isothecietum* Lippmaa 1935', '*Anomodontetum viticulosi* Felföldy 1941', '*Brachythecietum salebrosi* Felföldy 1941', '*Mnietum cuspidati* Felföldy 1941' and '*Homalietum* Barkman 1949' into a single association. On basis of priority the correct name for this association is '*Anomodonto-Isothecietum* Lippmaa 1935' published as 'association à *Anomodon longifolius* et *Isothecium myurum*' by Lippmaa (1935, pp. 23–24), an epiphytic association of bryophytes occurring at the base of the trunks of the trees.

2. Hilitzer (1925) published, in the same paper, the 'association à *Parmelia furfuracea*' on p. 122, the 'association à *Parmelia physodes*' on p. 107, the 'association à *Cetraria glauca*' on p. 132 and the 'association à *Cetraria glauca* et *Ochrolechia androgyna*' on p. 138. These associations were united by Barkman (1958, p. 456) into a single association for which he chose the name '*Parmelietum furfuraceae* Hilitzer 1925'. This latter name is thus the correct one when that syntaxonomic concept is followed.

3. Willner (in Willner & Grabherr, 2007, p. 164) united the subassociations '*Saxifraga rotundifoliae-Fagetum calamagrostietosum variae* Zukrigl 1989' and '*Saxifraga rotundifoliae-Fagetum rhododendretosum hirsuti* Zukrigl 1989'. The first epithet '*calamagrostietosum variae*' was chosen for the combined subassociation and this choice must be followed if one accepts this syntaxonomic viewpoint.

Article 26 – Change in position of a subassociation

A subassociation's epithet retains its priority only within the pertinent association name. Therefore, when a subassociation is transferred to another association or placed under another association name for the same association, the author(s) is (are) free to retain its epithet with its nomenclatural type. In either case, if the association to which the subassociation is transferred has not yet been subdivided into subassociations, then a subassociation '*typicum*', containing the type of the association name is automatically created, not followed by an author citation (see Art. 13b).

When the epithet is retained, a retention or a reintroduction is forbidden when a later homonym arises (see Art. 31).

When the epithet is not retained, the author(s) is free to publish a new subassociation epithet with a new type.

On or after 1 January 2002, an unambiguous reference (see Art. 2b, Note 3) to the original diagnosis of the subassociation must be indicated if the epithet is to be retained, and the new combination must be explicitly indicated in accordance with Art. 3i. The author citation corresponds to Art. 50.

Note 1: The transfer of a subassociation epithet to an alternative name (Art. 30) or to a corrected or mutated form of the same association name (Arts. 40 through 45) does not constitute a new combination.

Example 1

Moor (1942, p. 387) published validly the new subassociation '*Trisetetum flavescens crepidetosum mollis*'. Theurillat (1992c, p. 324) transferred that subassociation to the '*Anthrisco-Trisetetum* (Marshall 1951) Dietl ex Pfister 1984' and retained the subassociation epithet '*crepidetosum mollis*': '*Anthrisco-Trisetetum crepidetosum mollis* (Moor 1942) *comb. nov.*'. Since the '*Anthrisco-Trisetetum*' had not been subdivided into subassociations, the author introduced on p. 323 a new subassociation called '*typicum*' containing the type of the association.

Article 27 – Change in rank

a. When a syntaxon of secondary rank higher than association (suballiance, suborder, subclass) whose name does not contain the type of the name of the next higher syntaxon of principal rank (alliance, order, class) is raised to a principal rank, the original diagnosis and the type of the name remain unaltered. The original author citation is presented in

brackets before the author citation of the new name (see Art. 51), followed by the designation for a new rank (see Art. 3i).

On or after 1 January 1979, the name at the new rank must be formed by changing only the rank-indicating termination (Art. 3m but see Art. 3h for exceptions). However, if a later homonym would be formed (see Art. 31) at the date of the publication of the name at the new rank, then the name at the new rank must be formed with other name-giving taxa.

On or after 1 January 2002, the name at a new rank is validly published only if it is followed by the Latin expression '*status novus*' ('*stat. nov.*') or the English one 'new status' after the authority (see Art. 3i) and if the basionym (see Def. XI) is explicitly indicated and accompanied with an unambiguous reference (see Art. 2b) to the original diagnosis.

Note 1: Changes in rank can occur only between corresponding principal and secondary ranks. Changes between principal ranks (e.g. alliance to order and vice versa) are not permitted.

Note 2: A change of rank does not correspond to the description of a new syntaxon (see Def. XIII). An unambiguous reference to the basionym is needed, yet not the citation of the type of the latter.

Example 1

Biondi, Casavecchia, Estrelles & Soriano (2013, p. 544) published the new alliance '*Halocnemion strobilacei*'. However, the authors included as a syntaxonomic synonym the suballiance '*Halocnemenion strobilacei* Géhu et Costa in Géhu, Costa, Biondi, Peris et Arnold 1984' (Géhu, Costa, Biondi, Peris & Arnold, 1984, p. 362) and selected the type of that suballiance as the type of the new alliance. Therefore, the '*Halocnemion strobilacei*' is not a new syntaxon but a new rank of the same syntaxon (see Def. XIII). Hence, the original author citation must be cited within brackets, namely '*Halocnemion strobilacei* (Géhu et Costa in Géhu, Costa, Biondi, Peris et Arnold 1984) Biondi, Casavecchia, Estrelles et Soriano 2013'. This name is, however, illegitimate since it is a later homonym of the *Halocnemion strobilacei* Korzhenevskii et Kliukin in Korzhenevskii 2000 (Korzhenevskii, 2000, pp. 16, 18) (see also Art. 29c, Example 4).

b. When a syntaxon of principal rank higher than association (alliance, order, class) is reduced to a secondary rank (suballiance, suborder, subclass, respectively), the original diagnosis and the type remain unaltered. The original author citation is presented in brackets before the author citation of the new name (see Art. 51), followed by the

designation for a new rank (see Art. 3i). The syntaxon at the new rank must be subordinated to another syntaxon of principal rank (alliance, order, class).

Simultaneously, two syntaxa of the same rank are united and Art. 25 applies. If the syntaxon receiving the subordinated secondary rank was not previously divided in secondary ranks, Art. 24b applies.

On or after 1 January 1979, the name of the new subordinated secondary rank must be formed by changing only the rank-indicating termination (Arts. 3h, and 3m). , However, if a later homonym would be formed (see Art. 31) at the date of the publication of the name at the new rank, then the name at the new rank must be formed with other name-giving taxa.

On or after 1 January 2002, the name at a new rank is validly published only if it is followed by the Latin expression '*status novus*' ('*stat. nov.*') after the authority (see Art. 3i) and if the basionym (see Def. XI) is explicitly indicated and accompanied with an unambiguous reference (see Art. 2b) to the original diagnosis.

Note 1: Since a change of rank does not correspond to the description of a new syntaxon (see Def. XIII), only an unambiguous reference to the basionym is requested. The citation of the type of the basionym is not needed.

Example 1

Oberdorfer (1957, p. 489) reduced the alliance '*Luzulo-Fagion* Lohmeyer et Tüxen in Tüxen 1954' (Tüxen, 1954, p. 460) to the 'Unterverband *Luzulo-Fagion* (Lohm. et Tx. 54)' [*recte*: '*Luzulo-Fagenion* (Lohmeyer et Tüxen 1954) Oberdorfer 1957'] within the alliance '*Fagion* Tx. et Diem. 36' [*recte*: '*Fagion sylvaticae* Luquet 1926'].

c. When an association is reduced to the rank of subassociation, the original diagnosis and the type remain unaltered. The new subassociation must be subordinated to another association and a new subassociation name must be validly published for it (see Art. 26). Simultaneously, two associations will be unified and Art. 25 applies. The author citation of a new name of a subassociation after a change in rank follows Art. 51.

On or after 1 January 2002, the name at a new subassociation rank is validly published only if the new combination is used and is explicitly indicated as new (see Arts.

3i and 4b) and if the basionym (see Def. XI) is explicitly indicated and accompanied with an unambiguous reference (see Art. 2b) to its original diagnosis.

Example 1

Catteau (2014, p. 136) published the new subassociation '*lysimachietosum nemorum* (Brun-Hool 1975) Catteau stat. nov. hoc loco' within the association '*Galio aparines-Impatientetum noli-tangere* (H. Passarge 1967) Tüxen in Tüxen & Brun-Hool 1975'. Although a lectotype for the subassociation '*lysimachietosum nemorum* was selected from the table 2 of Tüxen & Brun-Hool (1975), and an unambiguous reference was given, the subassociation was invalidly published because there was no formal indication of the association that was reduced at the subassociation rank.

d. When a subassociation is raised to the rank of association, the original diagnosis and the type remain unaltered. The original author citation is presented in brackets in front of the author citation of the new name (see Art. 51).

On or after 1 January 2002, the new association is validly published only if it is accompanied by the Latin expression '*status novus*' ('*stat. nov.*') or the English expression 'new status' (see Art. 3i), and if the basionym (see Def. XI) is explicitly indicated and accompanied with an unambiguous reference (see Art. 2b) to its original diagnosis.

Examples

1. Royer (1991, p. 208) raised the subassociation '*Mesobrometum brachypodietosum* Lacoste 1975' to the rank of an association carrying the new name '*Diantho pavonii-Brachypodietum pinnati* (Lacoste 1975) Royer 1991'. The name is validly published although the '*Mesobrometum brachypodietosum* Lacoste 1975' is a later homonym of the '*Mesobrometum brachypodietosum* Kuhn 1937'.

2. Biondi, Casavecchia & Pesaresi (2010, p. 700) published the new name '*Lauro nobilis-Quercetum virgilianae*' indicating that the association corresponds to the '*Roso sempervirentis-Quercetum pubescentis lauretosum nobilis* Allegrezza, Biondi et Felici 2006' in Allegrezza, Biondi & Felici (2006). However, there is no subassociation '*lauretosum nobilis*' published in Allegrezza et al. (2006) where this subassociation is given as '*Roso sempervirentis-Quercetum pubescentis lauretosum nobilis* Biondi et Allegrezza 2004' on p. 139, yet without a bibliographical reference to Biondi & Allegrezza (2004). Therefore, the '*Lauro nobilis-Quercetum virgilianae*' in Biondi et al. (2010) is not a change of rank of the subassociation '*lauretosum nobilis* Biondi et Allegrezza 2004' but it is a new, invalidly published name for a new syntaxon since the listed type relevé (relevé 6, table VI) does not exist in Allegrezza et al. (2006).

Article 28 – Change in position of secondary ranks above association

When a syntaxon of secondary rank (suballiance, suborder, subclass), whose name does not contain the type of the name at the principal rank gets a new position by being transferred to another syntaxon of the same principal rank (alliance, order, class, respectively), then Art. 24b applies. The transferred name and the author citation remain unaltered.

Chapter 7. Rejection of names and epithets

Article 29 – General rejection of names and epithets

a. [deleted]

b. Those names of associations and syntaxa at a higher rank published before 1 January 2002 will be considered illegitimate when no name-giving taxon belongs to the highest of the dominant strata determining the vertical structure of the vegetation (e.g. no tree species in a forest community, no shrub species in a shrub community, no herb or dwarf shrub species in a herb or dwarf shrub community). The judgment about the dominant strata should be based on the type of the name of the syntaxon, or on the original diagnosis when no type has been designated or if the information cannot be retrieved from the type.

In cases where determining the dominant strata is ambiguous a request for a binding decision may be submitted to the Committee for Change and Conservation of Names (CCCN) (for instructions see Appendix VI). The CCCN recommendation, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature (see Def. XIV), will become binding, and as such listed in Appendix VII.

When published on or after 1 January 2002, such names are published invalidly (see Art. 3k).

Examples

1. The name '*Melica uniflora*-Assoziation' in Markgraf (1927, p. 50) must be rejected as illegitimate for an association of beech forest with *Melica uniflora* since no species from the dominant tree layer was used as a name-giving taxon.

2. The name '*Rhodothamneto-Rhodoretum hirsuti* (Aichinger 1933) Br.-Bl. und Sissingh 1939' in Braun-Blanquet et al. (1939, p. 110) [recte: *Rhodothamno-Rhododendretum hirsuti* Aichinger ex Braun-Blanquet et Sissingh in Braun-Blanquet, Sissingh et Vlieger 1939] must be rejected as illegitimate for a scrub on calcareous bedrock dominated by the prostrate pine *Pinus mugo* Turra 1764 since neither *Rhodothamnus chamaecistus* (L.) Rchb. 1827 nor *Rhododendron hirsutum* L. 1753 belong to the dominant shrub layer.

3. The subassociation name '*Rhodoreto-Vaccinietum mugetosum* Br.-Bl. 1939' in Braun-Blanquet et al. (1939, p. 40) [recte: *Rhododendro-Vaccinietum pinetosum mugo* Braun-Blanquet in Braun-Blanquet, Sissingh et Vlieger 1939 (Art. 14b, Example 1, and Art. 41b, Example 4)] is legitimate although the dominating *Pinus mugo* Turra 1764 belongs to the shrub layer whereas the association corresponds to a dwarf shrub community.

4. The name '*Chrysanthemion rotundifolii*' in Krajina (1933, p. 145) is illegitimate because the only association included in the original diagnosis on p. 146, the '*Piceeto-Chrysanthemetum rotundifolii*' [recte: *Chrysanthemo rotundifolii-Piceetum nom. invers.*], is a spruce forest while the name-giving species of the alliance name belongs to the herb layer.

5. Lucchese, Persia & Pignatti (1995, p. 149) published validly the '*Polygalo flavescentis-Brachypodietum rupestris*' for a widespread, semi-dry meadow of the Central Apennines. However, they selected a type relevé that contains the shrub *Spartium junceum* L. 1753, with a cover of 4 on the Braun-Blanquet scale. According to Art. 29b the dominant stratum in the type relevé is the shrub layer due to a cover at least of 50% of *S. junceum*, hence because the '*Polygalo flavescentis-Brachypodietum rupestris*', was published before 1 January 2002, the selected type makes it an illegitimate name. However, *S. junceum* is present only in the type relevé and one other relevé from 18 relevés of the original diagnosis, where species of the herb stratum are dominant, among them *Brachypodium rupestre* (Host) Roem. & Schult. 1817 with a cover of 3 on the Braun-Blanquet scale in the type relevé. Therefore, a conserved type should be selected (see Art. 53) to preserve the current use of the name.

c. A new name for a syntaxon whose original diagnosis contains the original diagnosis of a syntaxon of the same rank (for subassociations at the same position, see Art. 26) published earlier or at least the nomenclatural type of its legitimate name (which may be

given merely in the synonymy; see Art. 7, Note 2, and Art. 8, Note 2), represents a superfluous name (*'nomen superfluum'*, *'nom. superfl.'*) that is therefore illegitimate (see Art. 18b). Such a name is not superfluous when the earlier name is later proved to be illegitimate.

Examples

1. The name '*Sedo-Scleranthetalia* Br.-Bl. 1955' has been rejected by Müller (1961, p. 116) and substituted by the name '*Sempervivo-Sedetalia comb. nov.*' because the combination of names *Sedum-Scleranthus* was deemed not informative. However, since the name '*Sempervivo-Sedetalia* Müller 1961' includes the '*Sedo-Scleranthetalia* Br.-Bl. 1955' as a synonym, with an unambiguous reference to the original diagnosis, the name '*Sempervivo-Sedetalia*' is a superfluous name of the earlier name '*Sedo-Scleranthetalia* Br.-Bl. 1955'.
2. Foucault (1991, p. 167) designated the order '*Empetretalia hermaphroditi* Schubert 1960' as the type of the '*Calluno-Vaccinietea myrtilli* (Br.-Bl. 1939) cl. nov.' [recte: '*Calluno-Vaccinietea myrtilli* B. de Foucault 1991']. However, the '*Empetretalia hermaphroditi*' is the holotype of the class '*Loiseleurio-Vaccinietea* Egger ex Schubert 1960' published in Schubert (1960, p. 194). Therefore, the name '*Calluno-Vaccinietea myrtilli* B. de Foucault 1991' is a superfluous name of the earlier name '*Loiseleurio-Vaccinietea*' published in Schubert (1960, p. 194).
3. The '*Prunus spinosa-Carpinus betulus*-Ass. Tx. (1928) 1952' [recte: '*Carpino betuli-Prunetum spinosae* Tüxen 1952 *nom. invers.*'] in Tüxen (1952, p. 92) includes, as a Baltic variant, the '*Prunus spinosa-Crataegus*-Assoziation' [recte: '*Pruno-Crataegetum*'] published by Hueck (1931, p. 165). Since there is neither direct nor indirect bibliographical reference to Hueck (1931) in Tüxen (1952), the '*Carpino betuli-Prunetum spinosae*' does not include formally the '*Pruno-Crataegetum* Hueck 1931' in the synonymy. Therefore, the '*Carpino betuli-Prunetum spinosae* Tüxen 1952 *nom. invers.*' is not a superfluous name but merely a later syntaxonomic synonym of the '*Pruno-Crataegetum* Hueck 1931'.
4. Arrigoni & Viciani (2001, p. 60) described validly the new association '*Teucurio scorodoniae-Castanetum sativae*' [recte: '*Teucurio scorodoniae-Castaneetum sativae*'] which they divided in four validly published subassociations. Gabellini, Viciani, Lombardi & Foggi (2006, p. 90) raised one of the four subassociations, the '*Teucurio scorodoniae-Castaneetum sativae quercetosum cerridis*' to association level as the '*Luzulo pedemontanae-Quercetum cerridis* ass. nov. et stat. nov.' for which they designated a type relevé. However, they did not designate the type relevé of the subassociation *quercetosum cerridis* and they used instead the type of the association *Teucurio scorodoniae-Castaneetum sativae*. Therefore, the new '*Luzulo pedemontanae-Quercetum cerridis*' represents

inadvertently a superfluous, illegitimate name (*'nomen superfluum'*) of the earlier *'Teucris scorodoniae-Castaneetum sativae'*.

5. Biondi et al. (2013, p. 544) published the *'Halocnemion cruciati'*. This new alliance includes, as a syntaxonomic synonym [*recte*: corresponding name], the suballiance *'Halocnemenion strobilacei* Géhu et Costa in Géhu, Costa, Biondi, Peris et Arnold 1984' with its type (*'Arthrocnemo glauci-Halocnemetum strobilacei* Oberd. 1952'), since the latter is the unique element of the original diagnosis of Géhu et al.'s suballiance (Géhu et al., 1984, p. 362). Since Biondi & al. (2013) selected also the type of the same *'Halocnemenion strobilacei'* as the type of a second, new alliance, the *'Halocnemion strobilacei'* (see Art. 27a, Example 1), the name of the first alliance, the *'Halocnemion cruciati'*, is automatically a superfluous name of the new *'Halocnemion strobilacei'* or vice-versa. (The two alliances are published simultaneously.) However, since the new *'Halocnemion strobilacei'* is a later homonym (see Art. 27a, Example 7), the *'Halocnemion cruciati* Biondi, Casavecchia, Estrelles et Soriano 2013' is not superfluous and, in fact, is the legitimate name for the new, illegitimate *'Halocnemion strobilacei* Biondi, Casavecchia, Estrelles et Soriano 2013' published simultaneously.

Article 30 – Special limits of rejection of names and epithets

a. Before 1 January 2002, when an author published simultaneously one or more alternative names (Def. VI, Note 2) for the same syntaxon, these names are homotypic synonyms that can be used alternatively (Art. 22). In case of conflict between an alternative name and another name, a proposal to conserve one name over the other one can be submitted to the Committee for Change and the Conservation of Names (see Art. 52).

Example 1

The name *Ulicetum nani* in Allorge (1921, p. 521) and the name *Ulici-Callunetum* on p. 523 in Allorge (1922) are homotypic synonyms because they belong to the same paper (see Art. 1, Note 2), although they have been published in separate parts with an interval of several months (see also Art. 23, Note 1).

b. A subassociation epithet is not illegitimate merely because it was originally published in combination with an illegitimate association name.

Examples

1. The subassociation '*Fagetum silvaticae croaticum abietetosum*' published in Horvat (1938, p. 200) is not illegitimate and must not be rejected because it is published with the illegitimate association name '*Fagetum silvaticae croaticum* Horvat 1938'.

2. The subassociation epithet '*impatietosum*' in the name '*Dentario enneaphylli-Fagetum impatientetosum* (Hartmann et Jahn 1967) Moravec 1974' (Moravec, 1974, p. 118) is not illegitimate and must not be rejected for the reason that it was originally published with the illegitimate association name '*Dentario enneaphyllidis (Abieti)-Fagetum*' [recte: '*Dentario enneaphylli-Abieti-Fagetum*'] in Hartmann & Jahn (1967, p. 408).

Article 31 – Homonymy - a reason for rejection of names and epithets

The name of a syntaxon is illegitimate and must be rejected when it is a later homonym, i.e. when it is spelt exactly like a name previously and validly published for a syntaxon based on another type (that therefore has another author citation). The later homonymous name of the syntaxon is illegitimate and must be rejected, even when the earlier homonym is illegitimate or relegated to synonymy for syntaxonomic reasons, or when the earlier homonym is not derived from the same name-giving taxon, but from a homonym of that name-giving taxon.

An exception is made when the homonymy results from a mutation performed with homotypic taxon names. In this case the later, homonymous mutated name is considered as a homonymous, alternative form of the original name that has been mutated (Art. 22). It is not rejected in front of the earlier name causing the homonymy that is itself a later homonym of the original name that has been mutated (see Art. 32b and Art. 45, Example 3).

When a syntaxon name is automatically corrected by replacing an incorrect name-giving taxon by its correct name according to Art. 44 the date of the original name is relevant regarding homonymy. If a name is to be rejected as a later homonym of the corrected name, it can be proposed for conservation to the Committee for Change and Conservation of Names (see Art. 52).

Note 1: Names of syntaxa having identical forms are considered to be homonyms when they are published at a later date without the original author(s) reference or without any reference to the author(s) of an earlier name (but see Rec. 46J).

Note 2: The names of syntaxa that merely appear identical as they were published in the original publication without indication of the specific epithets, are not homonyms when it is clear from the original diagnoses that they are based on different taxa. They are to be completed by the addition of the specific (or infraspecific) epithets so that they appear different (see Rec. 10C and Art. 40b).

Examples

1. The names '*Caricetum davallianae*' in Dutoit (1924, p. 24), '*Caricetum davallianae*' in Kulczyński (1928, p. 162), and '*Caricetum davallianae*' in Klečka (1930, p. 87) are homonyms since Kulczyński (1928) and Klečka (1930) did not refer to Dutoit (1924). The names in Kulczyński (1928) and Klečka (1930) must be rejected as later homonyms.

2. The names '*Cardamineto-Montion*' [recte: '*Cardamino-Montion*'] in Braun-Blanquet (1926, p. 39) and '*Cardamineto-Montion* Br.-Bl. 1926' [recte: '*Cardamino-Montion*'] in Westhoff, Dijk & Passchier (1946, p. 58) are no homonyms as the reference to Braun-Blanquet, the earlier author of the name, is given by means of the author citation in Westhoff et al. (1946).

3. The name '*Festuco sulcatae-Brachypodietum*' published by Soó (1927, p. 85) must be corrected to '*Festuco rupicolae-Brachypodietum* Soó 1927 nom. corr.' according to Art. 44 since the name-giving taxon *Festuca sulcata* (Hack.) Nyman 1882 is a later synonym of *F. rupicola* Heuff. 1858 that is the correct name. Yet, this correction is making the later name '*Festuco rupicolae-Brachypodietum*' published by Mahn (1965, p. 103) a later homonym.

Recommendation 31A

The names of syntaxa that cannot be corrected because they would produce later homonyms (Art. 43) should be cited in the synonymy of the correct, later name as 'inadequate names' ('*nomina inepta*', '*nom. inept.*') (see Art. 43, Note 3).

Article 32 – Special cases of homonymy

The names of syntaxa that are based on different nomenclatural types are treated as homonyms in the following cases:

a. When they are orthographic variants. The orthographic variants in the sense of this rule are those names that differ in the way a name corrected according to Art. 41 differs from the original form of the name.

Example 1

The names 'association à *Carpinus betulus*' in Issler (1926, p. 28) and '*Carpinetum*' in Klika (1928, p. 37) are treated as homonyms.

b. When they are formed from homotypic taxon names (i.e. the names of the taxa have the same type). As an exception, a mutation performed with homotypic taxon names does not create a later homonym of the name that is mutated (see Art. 31 and Art. 45, Example 3).

Example 1

The name '*Salicornietum perennis*', validly published by Samek (1973, pp. 46, 68), and the name '*Sarcocornietum perennis*', validly published by Fernández & Santos (1983, p. 149) are treated as homonyms because the name-giving taxa *Salicornia perennis* Mill. 1768 and *Sarcocornia perennis* (Mill.) A. J. Scott 1978 are homotypic taxon names, hence they are nomenclatural synonyms. Therefore, the '*Sarcocornietum perennis* Fernández & Santos 1983' is a later, illegitimate homonym of the '*Salicornietum perennis* Samek 1973' since it is not a mutation of that name.

c. When one name is formed from the specific epithet only while the other is formed from the binomial of the species name (see Art. 14b).

Examples

1. The names 'association à *Isoethecium myurum*' in Hilitzer (1925, p. 185) and '*Myuretum*' in Waldheim (1944, pp. 70, 81) are treated as homonyms (see also Art. 3c, Example 5).

2. The names '*Curvuletum*' in Rübel (1911, p. 170) and '*Caricetum curvulae*' in Braun-Blanquet (1918, p. 39) are treated as homonyms. The correct citation of the name is '*Caricetum curvulae* Rübel 1911'.

d. When they are names formed with two name-giving taxa that differ only in the order of the names of the taxa.

Article 33 – Homonyms of equal age

If homonyms (see Arts. 31 and 32) have been published simultaneously for two or more syntaxa (homonyms of equal age), the author must be followed who first adopts one of these names and rejects the other(s), or who introduces other names for the other homonyms.

Note 1: Names of syntaxa published in the same year are of equal age unless different dates of publication can be established (see Art. 1).

Examples

1. The name '*Adenostylion alliariae*' was published the same year both by Braun-Blanquet (1926, p. 37) and Luquet (1926a, p. 113). As no exact date of publication has been found for either names, the '*Adenostylion* Braun-Blanquet 1926' and the '*Adenostylion* Luquet 1926' are of equal age. The same applies for the names '*Genisto-Vaccinion* Braun-Blanquet 1926' and '*Genisto-Vaccinion* Luquet 1926' that are published in the same publications on p. 45 and p. 145, respectively.

2. The name '*Arrhenatherion*' was published in the same year both by Koch (1926, p. 124) and Luquet (1926a, p. 62). Mercadal & Villar (2018) confirmed the valid publication of the '*Arrhenatherion elatioris* Koch 1926' (see Art. 2b, Example 6), they adopted Koch's name, and simultaneously they rejected explicitly Luquet's name. This choice must be followed. It is confirmed by an earlier publication of the Koch's name in March 1926 (see also Art. 1, Example 6) when compared to the Luquet's name since Luquet defended his thesis on 12 June 1926, as written on the front page of Luquet's thesis available in the libraries in Bailleul (France) and Clermont-Ferrand (France). Luquet's thesis (1926b) is the same print as the "*Essai sur la géographie botanique de l'Auvergne*" (Luquet, 1926a).

Article 34 – Special cases of rejection of names and epithets

a. A name is illegitimate and must be rejected if it contains an epithet in the nominative case that indicates a geographical, ecological, morphological or other property such as '*normale*', but which is not derived from the specific epithet of the name-giving taxon. These names are invalid when published on or after 1 January 1979 (see also Arts. 3h and 4c).

Examples

1. The names '*Fagetum sudeticum*' in Preis (1938, p. 108), '*Caricetum goodenowii montanum et collinum*' in Kästner & Flößner (1933, p. 22), '*Vaccinietum myrtilli subalpinum*' in Sillinger (1933, p.

271), and '*Asplenietea rupestris* Br.-Bl. 1934' in Meier & Braun-Blanquet (1934, p. 1) (original form: '*Asplenietales rupestres*') are illegitimate and must be rejected.

2. On the other hand, the name '*Riccietum rhenanae*' in Knapp & Stoffers (1962, p. 119) which is derived from *Riccia rhenana* Lorb. ex Müll. Frib. 1942 and whose epithet is therefore in the genitive case, is legitimate.

3. The original diagnosis of the association '*Piceetum excelsae* Pawłowski' in Pawłowski, Sokołowski & Wallisch (1928, p. 258) contains the two validly published subassociations '*myrtilletosum*' and '*normale*'. However, the subassociation epithet '*normale*' is illegitimate and must be rejected.

b. Compound names with the prefix '*Eu-*' published for syntaxa of principal rank before 1 January 1979 are illegitimate and must be rejected. Such names are invalid when published on or after 1 January 1979 (see also Art. 3h).

Example 1

The name '*Eu-Fagion* Pawłowski 1928' in Klika & Novák (1941, p. 67) is illegitimate since it was used for an alliance.

c. Names whose form does not correspond to Arts. 10 and 13 since they have been formed from more than two (subassociation epithets from more than one) scientific names of taxa are illegitimate and must be rejected. Such names are invalid when published on or after 1 January 2021 (see Art. 3p).

Note 1: Names that contain both specific and infraspecific epithets must not be rejected but corrected in accordance with Art. 10a, Note 2.

Examples

1. The new association name '*Podocarpus latifolius-Acridochoeta volkensis-Cassipouretum malosanae*' in Bussmann & Beck (1995, p. 501) fulfils all the needed requirements for a valid publication before 1 January 2021. However, the name is illegitimate and must be rejected because it is formed from three names of taxa.

2. The name 'sous-association à *Ruta divaricata* et *Brassica oleracea* subsp. *insularis*' in Litardière (1928, p. 123) of the 'association silicicole à *Sedum dasyphyllum*, *S. brevifolium* et *Dianthus caryophylleus* subsp. *virgineus*' (p. 105) is validly published, although the name of the association is illegitimate because it is formed from more than two scientific names of taxa. However, the

subassociation name itself is also illegitimate as it contains more than one scientific name of taxa (Art. 13).

Article 35 [deleted]

Article 36 – Rejection of a nomen ambiguum

A name must be rejected when, due to an earlier misinterpretation or various emendations or for any other reason, it has been so often used in a false sense that excludes its type so that its re-introduction in its original correct sense would be a source of continual errors (*'nomen ambiguum'*, *'nom. amb.'*).

Since a judgement on the concept of *nomen ambiguum* is necessarily subjective, the rejection of a name on basis of this article will be regulated by the Committee for the Change and the Conservation of Names (CCCN) by the publication of *'nomina ambigua rejicienda'* (*'nom. amb. rejic.'*).

Until these names have been published the proposed rejection remains provisional (*'nomen ambiguum rejiciendum propositum'*, *'nom. amb. rejic. propos.'*). Authors are requested to send their proposal, accompanied by a statement of the reasons for the rejection, to the Committee for Change and Conservation of Names (CCCN) for decision (for instructions see Appendix II). The CCCN recommendation about the rejection, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature (GPN), will become binding. The accepted *nomina ambigua* will be listed in Appendix IV.

Example 1

The name *'Laricetum deciduae'* in Bojko (1931, p. 128) has been rejected by the GPN Assembly as a *nomen ambiguum* (Appendix IV; see also Willner et al., 2011, p. 67; Gigante et al., 2019, p. 309) because the name has been used to designate stands on calcareous bedrock but its type relevé corresponds to another association on non-calcareous bedrock. Therefore, its re-introduction in accordance to its type would be a source of continual errors.

Article 37 – Rejection of a nomen dubium

The name of an association or subassociation may be rejected when the type relevé, on which it is based, is considered so incomplete or complex that its assignment to one of the associations or subassociations distinguished today does not seem possible (*'nomen dubium'*, *'nom. dub.'*) (see also Art. 16).

Since a judgement on the concept of *nomen dubium* is necessarily subjective, the rejection of a name on basis of this article will be regulated by the Committee for Change and Conservation of Names (CCCN) by the publication of *'nomina dubia rejicienda'* (*'nom. dub. rejic.'*).

Until these names have been published the proposed rejection remains provisional (*'nomen dubium rejiciendum propositum'*, *'nom. dub. rejic. propos.'*). Authors are requested to send their proposal, accompanied by a statement of the reasons for the rejection, to the Committee for Change and Conservation of Names (CCCN) for decision (for instructions see Appendix II). The CCCN recommendation about the rejection, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature, will become binding. The accepted *nomina dubia* will be listed in Appendix V.

Article 38 – Rejection of the name of a syntaxon above the association rank based on a nomen dubium

The name of a syntaxon at ranks higher than association must be rejected as a *nomen dubium* when the name of the next subordinate syntaxon that typifies it, is considered a *nomen dubium*.

Article 39 – Substitution of a rejected name

a. When a name is rejected, the earliest available name at the same rank (for subassociations at the same position, see Art. 26) that is in accordance with the rules is to be adopted. If no such name is available, a replacement name must be formed. A replacement name (*'nomen novum'*, *'nom. nov.'*) published explicitly as a substitute for a name rejected according to Arts. 29b, 31, 34, 36, 43, 44, and 52 is typified by the type of the rejected name. The date of the valid publication of the *nomen novum* is crucial in

disputes about priority. The original author citation is to be inserted within brackets before the author citation of the *nomen novum* (see Art. 49).

Examples

1. The name '*Fagetum sudeticum* Preis 1938' must be rejected according to Art. 34. The earliest name for this association that is in accordance with the rules is '*Dentario enneaphylli-Fagetum Oberdorferi* 1957' which has been validly published as an alternative name (see Art. 3j, Example 1).

2. The name '*Fagetum silvaticae croaticum* Horvat 1938' must be rejected according to Art. 34a. The earliest name for this association that is in accordance with the rules is '*Fageto-Lamietum orvalae*' [recte: *Lamio orvalae-Fagetum silvaticae*] which has been published as an alternative name in the same publication (p. 212) by Horvat (1938) (see Art. 3j, Example 2).

3. Rudski (1949, p. 26) published posthumously the illegitimate name '*Quercetum confertae-cerris serbicum*' (Art. 34a). In the Serbian literature, this syntaxon was also used in the form '*Quercetum confertae-cerris* Rudski' and '*Quercetum confertae-cerris* Rudski 1949', however without an explicit statement of replacement of the geographical epithet '*serbicum*'. Hence, these forms cannot be considered as *nomina nova* replacing the name '*Quercetum confertae-cerris serbicum* Rudski 1949'. A correct *nomen novum* was introduced by Trinajstić, Franjić, I. Samardžić & J. Samardžić (1996, p. 301) who published the name '*Quercetum frainetto-cerris* Rudski 1949' [recte: *Quercetum frainetto-cerridis* (Rudski 1949) Trinajstić, Franjić, Samardžić et Samardžić 1996] as an explicit substitute of the '*Quercetum confertae-cerris serbicum* Rudski 1949'.

b. Before 1 January 2002, if there is no bibliographic reference to the replaced name, at least the author of the replaced name should be given to render the replacement name (*nomen novum*) valid.

On or after 1 January 2002, the replaced name must be cited unambiguously with the complete author citation, together with the reference (see Art. 2b, Note 3), and the replacement name (*nomen novum*) must be indicated as new (Art. 3i).

c. When a name is published as a substitute for a *nomen dubium* (Arts. 37 and 38) or a pseudonym (Def. X), it must be based on a new type. It does not represent a replacement name (*nomen novum*), but the name of a new syntaxon that must be published in accordance with Arts. 2 through 9.

Example 1

The Austrian authors have applied the name '*Festucetum variae* Rübel' for a syntaxon other than that for which it was published from Graubünden by Rübel (1911, p. 181 and error slip added in the second part published in 1912). Thus, the name '*Festucetum variae auct. non* Rübel 1912' represents a pseudonym of another syntaxon that was validly published as '*Pulsatillo albae-Festucetum variae*' in Theurillat (1989, p. 74).

Recommendation 39A

No one should publish a replacement name (*nomen novum*) for a name rejected according to Arts. 29b, 31, 34 or 36, while the author is still alive, without informing the original author beforehand of the case and without giving the original author an opportunity of publishing the *nomen novum*.

Recommendation 39B

For illegitimate names published before 1 January 1979, authors are recommended to look for the lectotype and to give an unambiguous reference to the publication of such lectotype when publishing the replacement name. If the rejected name has not been typified at the time of the publication of the replacement name, it is recommended to select a lectotype (see Arts. 19 and 20), or a neotype when there is no suitable published relevé available in case of typification of names of associations and subassociations (Art. 21; see also Art. 53).

Chapter 8. The correction of names

Article 40 – Retention and correction of syntaxon names

a. The original form of a name (see Def. VI, Note 1) should be retained unless a correction must be made according to Arts. 41 through 44 or a mutation is performed according to Art. 45.

Note 1: This provision does not cancel the permission to add specific epithets according to Rec. 10C.

b. For the name of a syntaxon published before 1 January 1979 for which Rec. 10C does not apply because it is not clear from the original diagnosis from which name(s) of species or infraspecific taxon (taxa) it was formed (see also Art. 3q), authors are invited to submit a proposal to the Committee for Change and Conservation of Names (CCCN) for selecting the name-giving taxon (for instructions see Appendix VI). The CCCN recommendation, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature (GPN), will become binding (see Def. XIV), and as such listed in Appendix VII.

Examples

1. The name '*Cymbalario-Asplenion*' in Segal (1969, p. 185) has been corrected on p. 220 by Rivas-Martínez & coautores (2011) to become '*Cymbalario muralis-Asplenion quadrivalentis*'. The addition of the specific epithet '*muralis*' is acceptable (Rec. 10C), but not in the case of the genus *Asplenium* L. 1753 since there is more than one species of *Asplenium* present in the original diagnosis. Therefore, the correction '*Cymbalario muralis-Asplenion quadrivalentis*' is invalid (Art. 3q).

2. The original diagnosis of the '*Cariceto-Fagetum*' Moor 1952 [*recte: Carici-Fagetum*] (Moor, 1952, pp. 95–97 and table 8) contains six species of the genus *Carex*, namely *Carex alba* Scop. 1772, *C. sylvatica* Huds. 1762, *C. flacca* Schreb. 1771, *C. digitata* L. 1753, *C. montana* L. 1753, and *C. ornithopoda* Willd. 1805 as an occasional species. Therefore, no taxon epithet can be added to the original form '*Carici-Fagetum*' unless a binding decision based on a proposal to CCCN would be ratified by the GPN Assembly.

c. When a name is corrected or mutated, the type and the author citation always remain unaltered (see Art. 48). In disputes about priority the date of the corrected or mutated name is that of the original name (see also Art. 31). However, when a later homonym is formed in a correction according to Art. 43 or in a mutation according to Art. 45, the date of the correction or the mutation, respectively, is crucial (but see also Arts. 31 and 32b).

Note 1: Art. 40c corresponds to Art. 40b in ed. 3 of the Code.

Note 2: In disputes about priority between synonyms, the date to be taken in consideration for a mutated name is the year of the publication of the original name, before the mutation has been implemented.

Article 41 – Special cases of correction of syntaxon names

Orthographic and typographic corrections: The name of a syntaxon must be corrected in the following cases:

- a. When the name-giving taxa are orthographically or typographically incorrect.

Example 1

The name '*Festucion vallesiacaе*' in Klika (1931, p. 376) must be corrected to '*Festucion valesiacaе* Klika 1931'.

- b. When the name is not in accordance with the orthographic rules for the formation of the names of syntaxa in Arts. 10a, 11, 12, and 14 (e.g. incorrect stem or genitive form, incorrect or missing connecting vowel, *-eto-* instead of the connecting vowel, termination *-ion* for a suballiance, termination *-etales* or *-inea* for a class, etc).

Note 1: Names published with a form not corresponding to the rank (Art. 3e), and names published on or after 1 January 1979 and containing a prefix or formed from unaltered plant names (Art. 3h), are invalidly published and thus cannot be corrected.

Examples

1. The name '*Sparganium angustifolium-Sphagnum obesum*-Ass. Tx. 1937' in Tüxen (1937, p. 43) is to be orthographically corrected (see Art. 14a) and inverted according to Art. 42 to become '*Sphagno obesi-Sparganietum angustifolii* Tüxen 1937 nom. invers.'.

2. The name '*Ericetum tetralicis* Subass. v. *Succisa pratensis* Tx. 1937' in Tüxen (1937, p. 112) is to be orthographically corrected to '*Ericetum tetralicis succisetosum pratensis* Tüxen 1937' (see Art. 14a).

3. The name '*Seslerieto-Semperviretum*' in Beger (1922, p. 112) is to be orthographically corrected to '*Seslerio-Caricetum sempervirentis* Beger 1922' (see Art. 14b).

4. The name '*Rhodoreto-Vaccinietum mugetosum* Br.-Bl. 1939' (Braun-Blanquet et al., 1939, p. 40) is a legitimate name (see Art. 29b, Example 3) which is to be orthographically corrected to '*Rhododendro-Vaccinietum pinetosum mugo* Braun-Blanquet in Braun-Blanquet, Sissingh et Vlieger 1939' (see Art. 14b).

5. The name '*Carpinetion*' (Issler, 1931, p. 83) is to be orthographically corrected to '*Carpinion* Issler 1931' (see Art. 11).

6. The name '*Rudereto-Secalinetales* Br.-Bl. 1936' (Braun-Blanquet et al., 1936, p. 3) is to be orthographically corrected to '*Ruderali-Secalietea* Braun-Blanquet in Braun-Blanquet, Gajewski, Wraber et Walas 1936' (see Art. 12).

c. When a part of the name, usually the taxon epithet, is placed within brackets, the brackets must be omitted.

Example 1

The name '*Deschampsio-Brometum (racemosi)*' (Oberdorfer, 1957, p. 191) is corrected to '*Deschampsio-Brometum racemosi* Oberdorfer 1957'.

Article 42 – Inversion of names

The name of a syntaxon must be inverted when the original diagnosis shows that it has not been formed in accordance with Art. 10b. The nomenclatural type is relevant to determine the correct order sequence of the name-giving taxa. If the information about the correct order sequence of the name-giving taxa cannot be retrieved from the type, then the original diagnosis is to be used. The author citation of the inverted name remains unaltered. However, the inversion is indicated by appending the expression '*nom. invers.*' ('*nomen inversum*') to the author citation (see Art. 48b).

The *nomina inversa* not following the rule must be re-established according to the rule. In cases where application of inversion is ambiguous, a proposal for a binding decision can be submitted to the Committee for Change and Conservation of Names (CCCN) (for instructions see Appendix VI). The CCCN recommendation, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature, will become binding (see Def. XIV), and as such be listed in Appendix VII.

Note 1: The request made in previous editions of the Code to submit proposals to invert names ('*nomen inversum propositum*') does not apply anymore.

Examples

1. The name '*Quercus sessiliflora-Lithospermum purpureo-coeruleum-Ass.*' published by Braun-Blanquet (1929, p. 51) must be inverted to become '*Lithospermo purpurocaerulei-Quercetum sessiliflorae* Braun-Blanquet 1929 *nom. invers.*' since *L. purpurocaeruleum* L. 1753 belongs to the herb layer and *Q. sessiliflora* Salisb. 1796 belongs to the dominant tree layer. Further, the name must be corrected according to Art. 44 to become '*Lithospermo purpurocaerulei-Quercetum petraeae nom. invers. et corr.*' (see Art. 44, Example 3).
2. In the original diagnosis of the '*Calluneto-Genistetum*' published by Tüxen (1937, p. 117), the three species *Genista pilosa* L. 1753, *G. anglica* L. 1753 and *Calluna vulgaris* (L.) Hull 1808 belong to the same dominant low shrub layer. With a cover of 4 to 5 on the Braun-Blanquet scale in the original diagnosis, *C. vulgaris* is dominant over *G. pilosa* that has a cover + to 2 on the Braun-Blanquet scale, and over *G. anglica* that has a cover + to 1 on that scale. Therefore, the original name must be inverted as '*Genisto-Callunetum vulgaris* Tüxen 1937 *nom. invers.*', yet without a specific epithet regarding the genus *Genista* L. 1753 (see Art. 40b).
3. Marschall (1947, p. 105) published the name '*Trisetto flavescens-Polygonion bistortae* Br.-Bl. et Tx.' that is often used in an inversed form because *Trisetum flavescens* (L.) P. Beauv. 1812 may dominate over *Polygonum bistorta* L. 1753. However, an inversion when both name-giving taxa belong to the dominant stratum applies to associations (Art. 10b § 2). Therefore, the original form of the alliance name is to be maintained.
4. Rivas-Martínez (1970, p. 151) published the name '*Cytiso-Genistetum cinerascens*' with the name-giving taxon *Cytisus purgans* (L.) Boiss. 1839. It was shown later that the latter species corresponds to *Cytisus oromediterraneus* Rivas-Martínez et al. 1984. Consequently, the association name was corrected by Rivas-Martínez & Cantó (1987, p. 241) (see Art. 44 Example 6). However, these authors made at the same time an invalid inversion of the name. Indeed, both name-giving taxa, *C. oromediterraneus* and *Genista cinerascens* Lange 1866, are shrubs of similar height. Although in the type relevé selected by Rivas-Martínez (1970) they have the same cover, in the relevés of the original diagnosis, *G. cinerascens* dominates over *C. oromediterraneus* more frequently than the reverse. Therefore, the corrected name is to be cited '*Cytiso oromediterranei-Genistetum cinerascens* Rivas-Martínez 1970 *nom. corr.*'.

Recommendation 42A

To avoid changes of the order sequence of the name-giving taxa of commonly used names of syntaxa, such names can be established as *nomina conservanda* (see Art. 52).

Authors are requested to send their proposals to the CCCN for decision, accompanied by a statement why not proceed with the inversion (for instructions see Appendix II). The accepted *nomina conservanda* will be listed in Appendix III.

Article 43 – Correction of names due to taxon misidentifications

When it can be shown that a misidentification of the name-giving taxon (taxa) (i.e. an error of identification according to the taxonomic reference that has been used) occurred in the original diagnosis or at least in the type relevé, the syntaxon name must be corrected. Only legitimate taxon names can be used for the correction otherwise it is invalid (Art. 3q). The name of the correcting author and the year of the effective publication of the correction are placed after the original author citation and preceded by the abbreviation '*corr.*' ('*correxit*') (Art. 48c).

A correction is forbidden when, at the date of its publication, it would form a later homonym of an earlier, validly published name (see Art. 31). For such a syntaxon the next later name at the same rank that is in accordance with the rules must be adopted to replace the name to be corrected. If no such a name is available, a replacement name ('*nomen novum*'; see Art. 39) must be formed according to the rules.

Before 1 January 2002, in order that a correction is considered validly published, the name to be corrected should be identifiable at least with its author citation (see Art. 46) or otherwise through a bibliographical reference allowing an unambiguous identification of the name.

On or after 1 January 2002, in order that a correction is considered validly published, the name to be corrected is to be indicated explicitly and accompanied by an unambiguous reference to the original publication. The new correction must be indicated (Art. 3i) by means of the Latin words '*nom. corr. nov.*' ('*nomen correctum novum*') or the English expression 'new correction' appended to the author citation of the original name (Art. 3i).

On or after 1 January 2021, to assure that a correction is validly published, the name-giving taxon (taxa) to be corrected and the name(s) used in the correction must be indicated with the author(s).

For a correction of a subassociation epithet to become validly published, the combination (Def. VII) must be indicated in its corrected form.

Note 1: There is no correction in the sense of Art. 43 when a name-giving taxon (taxa) is replaced by a narrower taxonomic concept instead of the broader one used in the original form of the syntaxon name, even if only the narrower taxon occurs in the relevés. A change of this kind corresponds to a mutation of name (Art. 45) and the names of syntaxa modified in this way must be cited as *nomina mutata* ('*nom. mut.*'), not as *nomina correctata* ('*nom. corr.*') (see Art. 45).

Note 2: In the previous editions of the Code, the corrections due to misapplications of a taxon name in the taxonomic reference that was used by the author(s) were ruled under Art. 43. Such corrections are now ruled under Art. 44.

Note 3: The original name that is rejected because it is formed by a misidentified name-giving taxon (taxa) is an 'inadequate name' ('*nomen ineptum*') (Def. V). The author citation of a '*nomen ineptum*' is followed by the abbreviation '*nom. inept.*' (Rec. 46E; see also Rec. 31A).

Note 4: A name corrected in the sense of Art. 43 can later be corrected according to Art. 44 or mutated according to Art. 45.

Examples

1. The name '*Medicagini marinae-Stachyetum spinosae*' published in Géhu, Costa, Biondi, Géhu-Franck & Arnold (1988, p. 99) must be corrected to become '*Medicagini marinae-Centaureetum spinosae*' since, due to a morphological convergence, the name-giving taxon *Centaurea spinosa* L. 1753 was confused with *Stachys spinosa* L. 1753 (Géhu, 1992, p. 30). However, it is not permitted, as performed by Géhu (1992, p. 31), to form a replacement name, such as the '*Timbro capitati-Centaureetum spinosae*', as a substitute for the name to be corrected (Art. 29) or to choose a new nomenclatural type (Art. 18). The original name is to be cited '*Medicagini marinae-Stachyetum spinosae* Géhu, Costa, Biondi et Géhu-Franck 1988 *nom. inept.*'.

2. The name '*Chaerophyllo-Valerianetum pyrenaicae*' was validly published in October by Carreras & Vigo (1984, p. 120). According to the original diagnosis, the name is based on *Chaerophyllum hirsutum* L. 1753, although *C. aureum* L. 1762 is also listed in one of the relevés. One month earlier, in September, Rivas-Martínez, Díaz, Fernández Prieto, Loidi & Penas (1984, p. 175) published the new association '*Chaerophyllo aurei-Valerianetum pyrenaicae*'. However, it was proven later that *Chaerophyllum aureum* was confused with *C. hirsutum* in the relevés of the latter association. When Izco, Guitián & Amigo (1986, p. 80) corrected the '*Chaerophyllo aurei-Valerianetum pyrenaicae*' and introduced the name '*Chaerophyllo hirsuti-Valerianetum pyrenaicae* Rivas-Martínez et al. 1984 *corr.*'.

Izco et Guitián in Izco et al. 1986', they created a later homonym of the '*Chaerophyllo hirsuti-Valerianetum pyrenaicae* Carreras et Vigo 1984'. Therefore, although the '*Chaerophyllo aurei-Valerianetum pyrenaicae* Rivas-Martínez, T.E. Díaz, Fernández Prieto, Loidi et Penas 1984' is an earlier name, its correction is not admissible because it is creating a later homonym. Consequently, Carrillo i Ortuño & Ninot i Sugrañes (1992, p. 100) published a replacement name for the '*Chaerophyllo aurei-Valerianetum pyrenaicae* Rivas-Martínez, Díaz, Fernández Prieto, Loidi et Penas 1984 *nom. inept.*', namely the '*Myrrhido-Valerianetum pyrenaicae* (Rivas-Martínez, Díaz, Fernández Prieto, Loidi et Penas 1984) Carrillo et Ninot 1992'.

Recommendation 43A

In order to avoid inadequate names (*nomina inepta*) (Def. V), authors performing a correction are requested to check carefully the correctness of the name-giving taxa according to the International Code of Nomenclature for algae, fungi, and plants (see Art. 44).

Article 44 – Correction of names due to priority, illegitimacy, rejection, and misapplication of taxon names

The name of a syntaxon must be corrected when it is derived from the name of a taxon that is not meeting the provisions in accordance with the International Code of Nomenclature for algae, fungi, and plants (ICN). In the correction, the correct name at the same taxonomic rank and with the same circumscription and position as the name-giving taxon is to be used.

In case of controversial interpretations of the correct taxon name, a request for binding decision may be submitted to the Committee for Change and Conservation of Names (CCCN) (for instructions see Appendix VI). The CCCN recommendation, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature, will become binding (see Def. XIV), and as such be listed in Appendix VII.

The author citation of the corrected name is to be followed by the abbreviation '*nom. corr.*' (*'nomen correctum'*) without referring neither to the correcting author nor the year of the correction (see Art. 48d).

When no correct taxon name of the same taxonomic rank and circumscription is available, the syntaxon name is to be used in its original form followed by the abbreviation '*nom. corrigend.*' ('*nomen corrigendum*'), i.e. 'name to be corrected' (see Rec. 46E).

The original name that must be corrected is rejected as an 'inadequate name' ('*nomen ineptum*', '*nom. inept.*') (see Def. V, Principle IV and Rec. 31A). The same applies when a correction of the original name is performed with an incorrect name-giving taxon. A *nomen ineptum* is illegitimate and cannot be used unless the incorrect name-giving taxon (taxa) would become conserved or restored later as the correct name(s) according to ICN. The author citation of a *nomen ineptum* is followed by the abbreviation '*nom. inept.*' (Rec. 46E).

The date of a corrected name is the date of the publication of the original name. A name to be corrected has the priority over a name of a later date if the correction produces a homonym of this later-dated name (Art. 31). On the opposite, if the name to be corrected would be a younger name, then the correction would produce a later homonym. In this case the correction is forbidden. For the later homonym created by the correction of the earlier name, and for the younger name to be corrected that would produce a later homonym, the next later name at the same rank, which is in accordance with the rules of this Code, must be adopted. If no such name is available, a replacement name (*nomen novum*, see Art. 39) must be formed according to the rules.

Note 1: In a correction according to Art. 44, the rank and the circumscription of the taxon (including that of the genus) must not be changed, otherwise it is not a correction but a mutation of the name (see Art. 45).

Note 2: The correct name of a name-giving taxon with a particular circumscription, position and rank is the earliest name that is in accordance with the rules of the International Code of Nomenclature for algae, fungi, and plants (ICN), except in specified cases. Particularly, for an infraspecific taxon (ICN Art. 11.4), the correct name is the combination of (a) the final epithet (i.e. the infraspecific epithet at the lowest rank retained) of the earliest legitimate name of the taxon in the same rank (i.e. the earliest legitimate name at the final infraspecific rank retained), with (b) the correct name of the species to which it is assigned.

Note 3: A misapplication of a taxon name occurs when authors used an incorrect name of a taxon because this name was employed in their identification literature in an incorrect sense (i.e. not in accordance with the nomenclatural type of the name of that taxon).

Note 4: A correction of a conserved name is automatically conserved in the same way as the original name.

Examples

1. The name '*Caricion canescenti-goodenowii*' published in Nordhagen (1937, p. 22) has been corrected as '*Caricion canescenti-fuscae* (Koch 1928) Nordhagen 1937' in Tüxen (1937, p. 62) or as '*Caricion curto-nigrae* W. Koch 1926 em. Nordh. 1936' in Westhoff & Den Held (1969, p. 198). Yet, none of these names is the correct syntaxon name since *Carex fusca* All. 1785 in the former case and *C. curta* Gooden. 1794 in the latter case are not the correct taxon names. The correct name for *C. goodenowii* Asch. & Graebn. 1889 is *C. nigra* (L.) Reichard 1778 while *C. canescens* L. 1753 is correct. Therefore, the original name '*Caricion canescenti-goodenowii*' must be corrected as '*Caricion canescenti-nigrae* Nordhagen 1937 *nom. corr.*'. The original form of the name is a *nomen ineptum* ('*Caricion canescenti-goodenowii* Nordhagen 1937 *nom. inept.*'), as are the inadequate corrections made by Tüxen (1937) ('*Caricion canescenti-fuscae* Nordhagen 1937 *nom. inept.*') and Westhoff & Den Held (1969) ('*Caricion curto-nigrae* Nordhagen 1937 *nom. inept.*').

2. The names '*Androsacion multiflorae*' published in Braun-Blanquet & Jenny (1926, p. 190) and '*Androsacetalia multiflorae* Br.-Bl. 1926' published in Meier & Braun-Blanquet (1934, p. 33) are derived from the species name *Androsace multiflora* (Vand.) Moretti 1822 which has been rejected as a later homonym of the name *Androsace multiflora* Lam. 1779. The names of the two syntaxa must therefore be corrected. Braun-Blanquet (1948, p. 35) corrected the names of these two syntaxa using the species name *Androsace vandellii* (Turra) Chiov. 1919. This correction was followed and the names '*Androsacion vandellii* Braun-Blanquet in Braun-Blanquet et Jenny 1926 *nom. corr.*' and '*Androsacetalia vandellii* Braun-Blanquet in Meier et Braun-Blanquet 1934 *nom. corr.*' were used, respectively. However, Dentant, Lavergne & Malécot (2018, p. 341) showed that the name *Androsace vandellii* (Turra) Chiov. 1919 [*recte: Androsace vandellii* Chiov. 1919] is not the correct name of this taxon since (a) its priority does not date back to the illegitimate *Aretia vandelli* Turra 1780 whose legitimate name is *Aretia multiflora* Vand. 1771, and (b) its type seems to belong to *Androsace alpina* (L.) Lam. 1779. The correct name of the species is *Androsace argentea* (C. F. Gaertn.) Lapeyr. 1813. Therefore, the correct names of the alliance and the order are '*Androsacion argenteae* Braun-Blanquet in Braun-Blanquet et Jenny 1926 *nom. corr.*' and '*Androsacetalia argenteae* Braun-Blanquet in Meier et Braun-Blanquet 1934 *nom. corr.*', respectively, and the former names are *nomina inepta*: '*Androsacion multiflorae* Braun-Blanquet in Braun-Blanquet et Jenny 1926 *nom. inept.*', '*Androsacion vandellii* Braun-Blanquet in Braun-Blanquet et Jenny 1926 *nom. inept.*', '*Androsacetalia multiflorae* Braun-Blanquet in Meier et Braun-Blanquet 1934 *nom. inept.*', and '*Androsacetalia vandellii* Braun-Blanquet in Meier et Braun-Blanquet 1934 *nom. inept.*'.

3. The name '*Quercion pubescenti-sessiliflorae*-Verband' in Braun-Blanquet (1932b, p. 8) is derived from the two species names *Quercus pubescens* Willd. 1796 and *Q. sessiliflora* Salisb. 1796, the latter being an illegitimate synonym of *Q. petraea* (Matt.) Liebl. 1784. The name '*Quercion pubescenti-petraeae* Braun-Blanquet 1932 *nom. corr.*' must be used for this syntaxon, and the original name is to be cited '*Quercion pubescenti-sessiliflorae* Braun-Blanquet 1932 *nom. inept.*'.

4. The name 'Association à *Isoetes setacea* et *Peplis hispidula*' [recte: '*Isoeto setaceae-Peplidetum hispidulae*'] in Braun-Blanquet (1936, p. 157) is derived from the specific name *Isoetes setacea* Bosc ex Delile 1827 which has been rejected as a later homonym of the name *Isoetes setacea* Lam. 1789. Until recently, both names were considered to belong to the same species. However, recent nomenclatural and taxonomic investigations (Greuter & Troia, 2015) have settled that this is not the case. *I. setacea* Lam. 1789 is not an amphibious plant and corresponds to *I. lacustris* L. 1753, while *I. delilei* Rothm. 1944 is the correct name for the amphibious *I. setacea* Bosc ex Delile occurring in the locality of Braun-Blanquet's relevés. Therefore, the name of the association must be correctly called *Isoeto delilei-Peplidetum hispidulae* Braun-Blanquet 1936 *nom. corr.*

5. The '*Pinus montana prostrata-Erica carnea*-Assoziation' [recte: '*Erico carneae-Pinetum prostratae nom. invers.*'] is validly published by Zöttl (1951, pp. 36, 70) (see Art. 31, Example 3). The name is based on *Pinus montana* var. *prostrata* Tubeuf 1912 which is a later, heterotypic synonym of the prostrate form of *Pinus mugo* Turra 1764. The prostrate form being the type of *P. mugo* Turra 1764, the '*Erico carneae-Pinetum prostratae*' must be corrected using the correct name *P. mugo* var. *mugo*. Yet, this step would produce a later homonym for the '*Erico-Pinetum mugo* Braun-Blanquet in Braun-Blanquet, Sissingh et Vlieger 1939 *nom. invers.*'. Therefore, the '*Erico carneae-Pinetum prostratae* Zöttl 1951 *nom. invers.*' cannot be corrected. If available, a later synonym must be used instead. If not, a replacement name (Art. 39) must be formed.

6. Rivas-Martínez (1970, p. 151) described the association '*Cytiso-Genistetum cinerascentis*' with *Cytisus purgans* (L.) Boiss. 1839 ('*Cytiso purgantis-Genistetum cinerascentis*' according to Rec. 10C). Since *Cytisus purgans* does not occur in the association and it was misapplied for a different taxon that must be named *Cytisus oromediterraneus* Rivas-Martínez, Díaz, Fernández Prieto, Loidi & Penas 1984 at the specific rank, then the name must be corrected to become '*Cytiso oromediterranei-Genistetum cinerascentis nom. corr.*' as done by Rivas-Martínez & Cantó (1987, p. 241). The original name is to be cited '*Cytiso purgantis-Genistetum cinerascentis* Rivas-Martínez 1970 *nom. inept.*'. However, an inversion of the name, as done by those authors at the time of the name correction, is not allowed (see Art. 42, Example 4).

7. The name '*Staticetum limonii*' published by Christiansen (1927, p. 38) is based on the species *Statice limonium* L. 1753, an earlier homotypic synonym of *Limonium vulgare* Mill. 1768. However, the

genus name *Statice* L. (type species: *Statice armeria* L. 1753) is rejected as a homotypic synonym of the conserved genus *Armeria* Willd. *nom. cons.* (ICN, Appendix III). Therefore, the correct name of the name-giving species is *Limonium vulgare* Mill. 1768, and the syntaxon must be correctly called '*Limonietum vulgare* Christiansen 1927 *nom. corr.*' (see also Willner, Grabherr, Pallas & Weber, 2011, p. 65). The original name is to be cited '*Staticetum limonii* Christiansen 1927 *nom. inept.*'.

8. The name '*Caricetum inflato-vesicariae*' (Koch, 1926, p. 63) is formed from the species name '*Carex inflata* Hudson' in accordance to the *Flora der Schweiz* of Schinz & Keller (1923) mentioned by Koch (1926) in the bibliography on p. 143. However, this is a misapplication of the name *Carex inflata* Hudson 1762 and the correct taxon is *C. rostrata* Stokes 1787 that is cited in the synonymy in Schinz & Keller (1923, p. 121). Therefore, the correct name of the association is *Caricetum rostrato-vesicariae* Koch 1926 *nom. corr.*, the original name is to be cited *Caricetum inflato-vesicariae* Koch 1926 *nom. inept.*

9. Rivas-Martínez (1977, p. 18) published the alliance '*Dryopteridion abbreviatae*'. Since the name-giving taxon *Dryopteris abbreviata* auct. non *D. filix-mas* var. *abbreviata* (DC.) Newman 1854 is a misapplied name for *Dryopteris oreades* Fomin 1910, the name of the syntaxon must be corrected according to Art. 44. Rivas-Martínez, Costa, Izco & Sáenz (1982, pp. 43, 54, 55) used the name '*Dryopteridion oreadis (abbreviatae)*'. However, the correct citation is '*Dryopteridion oreadum* Rivas-Martínez 1977 *nom. corr.*'. The original name is a '*nomen ineptum*': '*Dryopteridion abbreviatae* Rivas-Martínez 1977 *nom. inept.*'.

10. The name '*Molinerion*' in Braun-Blanquet, Pinto da Silva, Rozeira & Fontes (1952, table of the *Arenarieto-Cerastietum ramosissimae*) is formed from the species name *Molineria laevis* (Brot.) Hackel 1880 involving the generic name *Molineria* Parl. 1850 that is a later homonym of the name *Molineria* Colla 1826. Therefore, it has been proposed (Rivas-Martínez et al., 2002, p. 269) to use the species name *Molineriella laevis* (Brot.) Rouy 1913 to correct the name of the alliance to become '*Molineriellion laevis* Braun-Blanquet, Pinto da Silva, Rozeira et Fontes 1952 *nom. corr.*'. The original name is a '*nomen ineptum*': '*Molinerion* Braun-Blanquet, Pinto da Silva, Rozeira et Fontes 1952 *nom. inept.*'.

Recommendation 44A

Authors are requested when performing a correction to indicate the taxonomic reference (e.g. Flora or checklist, either published or on-line) they follow for the name-giving taxa, or at least to list the name-giving taxa with the authors' citation.

Recommendation 44B

Performing a correction may require nomenclatural investigations. Authors are recommended to check carefully that a correction is fully in accordance with ICN to avoid publishing unnecessarily *nomina inepta*. To this end, authors are requested to correct the name of a syntaxon only if the taxon name used in the original form of the syntaxon name is placed in the synonymy by several contemporary Floras and authoritative taxonomic treatments.

Article 45 – Mutation of names, an adaptation of syntaxon names to taxonomy

For a name-giving taxon, one or more correct names may be available according to taxonomic concepts that differ from the one used in the original diagnosis of the name of the syntaxon. The mutation of a syntaxon name in using these correct, alternative names of taxa provides a '*nomen mutatum*' ('*nom. mut.*') (plural: '*nomina mutata*') that is an alternative form of the syntaxon name (see Def. VI, Note 3). A mutation is authorized when the correct alternative name-giving taxa are used in more than one national or regional flora, authoritative checklist or authoritative taxonomic treatment, either published or online, on or after 1 January 1960.

In case of a taxonomic change, the replacement of an infraspecific name-giving taxon with a species name is forbidden and makes the mutation invalid (Art. 3q), unless the infraspecific taxon is no longer accepted in at least two floras covering the geographical distribution of the taxon.

When the name of an aggregate taxon is the name-giving taxon (see Art. 3l), it may be replaced by a correct species name occurring in that aggregate or a correct infraspecific name, respectively, provided that it is clear which (micro)species or infraspecific taxon occurs in the original diagnosis (see also Art. 43, Note1).

A mutation is validly published (Art. 3q) only when the authoritative taxonomic sources upon which the mutation is based are cited. The mutation must be accompanied by an unambiguous reference (see Art. 2b) to both the original name of the syntaxon that is mutated, and to the authoritative taxonomic sources used. In addition, the new

alternative form of the name must be followed by the Latin expression '*nomen mutatum novum*' ('*nom. mut. nov.*') or the English one 'new mutation' (see Art. 3i).

When a mutation is performed using an incorrect name-giving taxon that occurs in the taxonomic sources published on or after 1 January 1960, the *nomen mutatum* forms an inadequate, rejected name ('*nomen ineptum*', '*nom. inept.*') (see Def. V, Principle IV and Rec. 31A). It is illegitimate and cannot be used unless the incorrect name-giving taxon (taxa) would be conserved or restored later as the correct name(s). The author citation of a *nomen ineptum* is followed by the abbreviation '*nom. inept.*' (Rec. 46E).

Such alternative forms of the name of a syntaxon retain the original author citation, but the author and the year of the effective publication of the mutation are placed after the original author citation, and they are preceded by the expression '*mut.*' ('*mutavit*') appended to the author citation (see Art. 48e). The date of the alternative form of the name is the date of the publication of the mutation.

The introduction of a *nomen mutatum* is forbidden when it would form a homonym of a name validly published before the date of the mutation, except if the name-giving taxa are nomenclatural synonyms (see Arts. 31 and 32b, and Example 3).

A correction published before 1 January 2021 in accordance with Art. 43, § 1, 3rd sentence of ed. 3 of the Code (replacement of an aggregate species by the name of a narrowly defined species or a species name by an infraspecific name) is automatically accepted as a *nomen mutatum*, provided that such a name is not a later homonym of an earlier validly published name. The correction must mention the original name subject to correction and must be accompanied by an unambiguous reference (see Art. 2b) for the mutation to be deemed valid.

In addition to the provisional *nomina mutata proposita* ('*nom. mut. propos.*'), the illegitimate *nomina mutata* ('*nom. mut.*') published before 1 January 2021 are also considered invalidly published.

Note 1: The correct name of a name-giving taxon with a particular circumscription, position and rank is the earliest name that is in accordance with the rules of the International Code of Nomenclature for algae, fungi, and plants (ICN), except in explicitly specified cases.

Note 2: The different editions of a flora or a checklist count as a single flora or checklist, respectively.

Note 3: A *nomen mutatum* cannot be corrected in accordance to Art. 44. A new *nomen mutatum* with the correct name-giving taxon (taxa) must be published instead.

Note 4: Many corrections of names published before 1 January 2021 are not corrections in the sense of Art. 44 but mutations (see Examples 4 through 6).

Note 5: When a mutation corresponds in fact to a correction of a name according to Art. 44 since the name-giving taxon (taxa) used does (do) not correspond to a different taxonomic concept, the mutated name is invalidly published.

Note 6: A validly published mutation of a conserved name is automatically conserved in the same way as the original name.

Examples

1. The name '*Scirpeto-Phragmitetum*' in Koch (1926, p. 45) [*recte Scirpo-Phragmitetum*] has been validly published in using the name-giving taxon *Scirpus lacustris* L. 1753 instead of *Schoenoplectus lacustris* (L.) Palla 1888 that is mentioned in the original diagnosis (see Art. 10 Rec. 10A). The alternative form of the name of the syntaxon in using *Schoenoplectus lacustris* would be '*Schoenoplecto-Phragmitetum* Koch 1926 *mut.* [author + year]'.

2. The name '*Epilobietalia angustifolii* (Vlieger 1950) Tx. 1950' published in Rochow (1951, p. 6) has been used by later authors in the alternative forms '*Chamaenerietalia angustifolii*' and '*Chamerietalia angustifolii*' when considering that *Epilobium angustifolium* L. 1753 belongs to a separate genus other than *Epilobium* L. 1753, either *Chamaenerion* Séguier 1754 or *Chamerion* Holub 1972. According to the latest research (Sennikov, 2011) the correct generic name for a separate genus is *Chamaenerion* Séguier 1754, while *Chamerion* (Raf.) Raf. ex Holub 1972 is a later heterotypic synonym.

Chamaenerion angustifolium (L.) Scop. 1771 or the later synonym *Chamerion* are accepted in several floras and checklists published on or after 1 January 1960 (e.g. Tzvelev, 2006, sub *Chamerion*; Tison & Foucault, 2014). Thus, the alternative mutated form of the name of the syntaxon would be '*Chamaenerietalia angustifolii mut.* [author + year]'.

3. Samek (1973, p. 46) published the name '*Salicornietum perennis*'. Since *Salicornia perennis* Mill. 1768 is accepted under the separate genus *Sarcocornia* as *Sarcocornia perennis* (Mill.) A. J. Scott 1978 in several floras published on or after 1 January 1960 (e.g. Tison & Foucault, 2014; Pignatti, 2017a), the name '*Sarcocornietum perennis*' could be used as alternative form of the original name as proposed by Galán de Mera, García-Fuentes & Martínez-Quesada (2015, p. 235). Even though the name '*Sarcocornietum perennis*' is already published by Fernández & Santos (1983, p. 149), the mutation of the '*Salicornietum perennis* Samek 1973' would not produce a later homonym since

Salicornia perennis and *Sarcocornia perennis* are homotypic (nomenclatural) synonyms. Therefore, the '*Sarcocornietum perennis* Fernández et Santos 1983' is already a later homonym of the '*Salicornietum perennis* Samek 1973' (see Art. 32b, Example 1), and in case of a mutation of the '*Salicornietum perennis* Samek 1973' with *Sarcocornia perennis* the date of the mutated name will be the date of the original name, namely 1973.

4. The name '*Mugeto-Ericetum* Br.-Bl. 1939' [recte: '*Erico-Pinetum mugo* nom. invers.' (Arts. 10b and 14b)] in Braun-Blanquet, Sissingh & Vlieger (1939, p. 105) has been "corrected" and inverted by using *Pinus uncinata* DC. 1805 to become "*Erico carneae-Pinetum uncinatae* Br.-Bl. in Br.-Bl. et al. 1939 corr. Wallnöfer *hoc loco et nom. inv.*" (S. Wallnöfer, 1993, p. 268) because the association refers to a forest and not to a scrub. However, since *P. mugo* Turra 1764 in broad sense is the correct name at the specific rank, as used by Braun-Blanquet et al. (1939), i.e. including both the prostrate form (*Pinus mugo* Turra 1764 or *P. mugo* Turra 1764 subsp. *mugo*) and the erect form (*P. uncinata* DC. 1805 or *P. mugo* subsp. *uncinata* (DC.) Domin 1935), then *P. uncinata* is another, more restricted circumscription of the taxon at the specific rank. Therefore, the change made by Wallnöfer is not a nomenclatural correction according to Art. 44 but a mutation according to Art. 45. Since (a) the original form of the syntaxon name as well as an unambiguous reference to it (Art. 2b) have been provided, and (b) the species *P. uncinata* is accepted in more than one flora published on or after 1 January 1960 (e.g. Tutin et al., 1964; Pignatti, 2017b), the correction is automatically accepted as *nomen mutatum*. Therefore, the correct citation of the mutated form of the name reads '*Erico carneae-Pinetum uncinatae* Braun-Blanquet in Braun-Blanquet, Sissingh et Vlieger 1939 nom. invers. et mut. Wallnöfer 1993'.

5. The name '*Asphodelo microcarpi-Brachypodietum ramosi* Biondi et Mossa 1992', based on *Asphodelus microcarpus* Viviani 1824 has been corrected to become '*Asphodelo africana-Brachypodietum ramosi* Biondi et Mossa 1992 corr.' by Bacchetta, Guarino, Brullo & Giusso del Galdo (2005, p. 33) because *Asphodelus microcarpus* Viviani 1824 is a later heterotypic synonym for *A. ramosus* L. 1753, and additionally on the assumption that only *A. ramosus* var. *africanus* (Maire & Weiller) Z. Díaz & Valdés 1996 occurs in Sardinia. However, in using the variety *africanus* instead of the specific rank, Bacchetta et al. (2005) have not performed a nomenclatural correction according to Art. 44 but they mutated the syntaxon name. Although published before 1 January 2021, the '*Asphodelo africana-Brachypodietum ramosi* Biondi et Mossa 1992 nom. mut.' is validly published in Bacchetta et al. (2005) since (a) it was intended as a correction, (b) the original name of the syntaxon is mentioned explicitly and accompanied by an unambiguous reference, and (c) the variety *africanus* is accepted in more than one national flora or authoritative taxonomic treatment published on or after 1 January 1960 (e.g. Díaz Lifante & Valdés, 1996; Pignatti, 2017b). However, the mutated name must additionally be corrected (Art. 44) since the correct name for *Brachypodium ramosum* Roem. & Schult. 1817 is *B. retusum* (Pers.) P. Beauv. 1812. Therefore, the correct form of the original name is '*Asphodelo ramosi-Brachypodietum retusi* Biondi et Mossa 1992 nom. corr.'. The '*Asphodelo africana-*

Brachypodietum retusi Biondi et Mossa 1992 *nom. corr. et mut.* Bacchetta, Guarino, Brullo et Giusso del Galdo 2005' is an alternative, authorised form of the correct name, and the original name is a *nomen ineptum* ('*Asphodelo microcarpi-Brachypodietum ramosi* Biondi et Mossa 1992 *nom. inept.*') as well as the original mutation of the name ('*Asphodelo africana-Brachypodietum ramosi* Biondi et Mossa 1992 *mut.* Bacchetta, Guarino, Brullo & Giusso del Galdo 2005 *nom. inept.*').

6. The name '*Gaudinio fragilis-Hordeion bulbosi*' is validly published in Galán de Mera, Deil, Haug & Vicente Orellana (1997, p. 154) using *Gaudinia fragilis* (L.) P. Beauv. 1812 (at the species rank) as one of the name-giving taxa. Rivas-Martínez et al. (2002, p. 236) corrected the name of the alliance using the validly published variety *Gaudinia fragilis* var. *verticicola* Rivas-Martínez et Galán de Mera 2002. Such a change of the name of the syntaxon is not a nomenclatural correction according to Art. 44 but a mutation. However, since var. *verticicola* has not been accepted in at least two floras published on or after 1 January 1960, the '*Gaudinio verticicolae-Hordeion bulbosi* Galán de Mera, Deil, Haug & Vicente 1997 *nom. mut.* Rivas-Martínez, Díaz, Fernández-González, Izco, Loidi, Lousã et Penas 2002' is invalidly published.

7. Rivas Goday & Rigual Magallón (1959, p. 546) published the "Ass. nova. *Helianthemum racemosum* et *Teucrium lepicephalum*". The name has been mutated by Alcaraz, Díaz, Rivas-Martínez & Sánchez-Gomez (1989, p. 87) as '*Helianthemum thibaudii-Teucrietum lepicephali* Rivas Goday et Rigual 1956 *nom. mut.*' [recte: '*Helianthemo thibaudii-Teucrietum lepicephali* Rivas Goday et Rigual 1959 *nom. mut.*'] by replacing the name-giving taxon "*Helianthemum racemosum* (L.) Pau" indicated in Rivas Goday & Rigual Magallón (1959) by *H. syriacum* subsp. *thibaudii* (Pers.) Meikle 1970 without giving further clarification. Although the subspecies *thibaudii* is an accepted name in more than one national flora or authoritative taxonomic treatment published on or after 1 January 1960 or on-line, the mutation is invalidly published since all kind of mutations performed before 1 January 2021 are invalid.

Recommendation 45A

Performing a mutation requires nomenclatural investigations. To avoid inadequate mutations (*nomina inepta*), authors are requested to check carefully the correctness of the name-giving taxa according to ICN, and to make sure that an earlier homonym of the syntaxon name does not exist already.

Recommendation 45B

Authors should refrain from using provisional *nomina mutata proposita* in future. Instead, they are invited to publish the correct *nomina mutata* in accordance with the rules after checking the relevancy of the mutation in several recent floras and authoritative taxonomic treatments so that not to publish outdated *nomina mutata*.

Chapter 9. The author citation

Article 46 – Author of the name and year of its valid publication

To ensure that the indication of the name of a syntaxon is exact and complete, the author citation, i.e. the name of the author (names of authors) who first validly published or validated this name, together with the year of the valid publication or validation, must be quoted (see Def. XII). In special cases the author citation must be completed according to Arts. 48 through 51.

Recommendation 46A

In every publication, the name of each syntaxon should be accompanied by the author citation or at least by a bibliographic reference where the author citation can be found.

Recommendation 46B

In the author citation it is recommended to cite the full name of the author(s). To distinguish authors with identical names, the author publishing first will be cited without the initial of his/her first name, later author(s) will be cited with the initial of their first name(s). In cases where the initial of the first name(s) are not sufficient to avoid homonymy of author names more letters of the first name should be added.

It is recommended to consult the International Plant Name Index (<https://www.ipni.org/>) to avoid using the same author name for an author of names of taxa on one side and an author of names of syntaxa on the other side or to avoid having two different author names for someone who is at the same time an author of names of taxa and of syntaxa.

Example 1

The names 'Braun-Blanquet' (abbreviation 'Br.-Bl.') and 'Tüxen' (abbreviation 'Tx.') are cited for Josias Braun-Blanquet and Reinhold Tüxen, respectively; the names 'G. Braun-Blanquet' and 'J. Tüxen' designate Gabrielle Braun-Blanquet and Jes Tüxen, respectively.

Recommendation 46C

When the name of a syntaxon with a sufficient original diagnosis is validly published by an author(s) in the work of another author(s) or with authors in a different sequence, then, for bibliographical reasons, the name(s) of the author(s) who merely made the place available should be quoted with the word 'in' before the year of publication and after the name of the author(s) who formed the name and supplied the diagnosis.

Examples

1. The name '*Alysso-Sedion* Oberd. et Th. Müller 1961' is validly published in Müller (1961, p. 116). Therefore, the correct citation of the name is '*Alysso-Sedion* Oberdorfer et Th. Müller in Th. Müller 1961'.
2. The name '*Arenarion bertolonii*' is validly published by Gamisans in Mucina & Theurillat (2015, p. 76). Therefore, the correct citation of the name is '*Arenarion bertolonii* Gamisans in Mucina et Theurillat 2015'.
3. The name '*Mulgedio-Aconitetea* Hadač-Klika 1944' is validly published in Klika & Hadač (1944, p. 283). Therefore, the correct citation of the name is '*Mulgedio-Aconitetea* Hadač et Klika in Klika et Hadač 1944'.
4. The name '*Rumici-Astragaletea siculi* Pign. et Nimis' is validly published in Pignatti, Pignatti, Nimis & Avanzini (1980, p. 57). Therefore, the correct citation of the name is '*Rumici-Astragaletea siculi* Pignatti et Nimis in E. Pignatti, Pignatti, Nimis et Avanzini 1980'.

Recommendation 46D

When the name of a syntaxon is published by one author, but not validly, e.g. due to the absence of a sufficient original diagnosis (Art. 2, *nomen nudum*), or published merely as a synonym (Art. 3a), or as a provisional name (Art. 3b), or due to the absence of a name-

giving taxon in the original diagnosis (Art. 3f), it can be validated later by another author and ascribed to the first author (Art. 6). In such cases the validating author is the correct author for the author citation. However, the first author whom the name of the syntaxon was ascribed to by the validating author should be quoted (without the year) with the word 'ex' before the validating author.

In the same way, when a name of a syntaxon without rank (Art. 3c) or with a rank not corresponding to those given in Principle II (Art. 3d) is validated by a later author by giving it a rank according to the rules, it is recommended to quote (without the year) the author of the original diagnosis with the word 'ex' before the validating author.

When the author(s) to whom the name of the syntaxon is ascribed to is (are) quoted between brackets with the year, the quotation must be changed into 'ex' without the year.

Examples

1. The name '*Trisetum-Polygonum bistortae*' in Braun-Blanquet & Tüxen (1943, p. 8) was published as a *nomen nudum*. Marschall (1947) validated the name on pp. 105–106 by providing a sufficient original diagnosis by means of an unambiguous bibliographical reference which contained the validly published name of the subordinate association '*Trisetum flavescens*' in Beger (1922, pp. 97–104), and a list of character species on p. 119. It is recommended that the name is quoted *Trisetum-Polygonum bistortae* Braun-Blanquet et Tüxen ex Marschall 1947 rather than *Trisetum-Polygonum bistortae* Marschall 1947.

2. The name '*Sisymbrium officinalis* Tx., Lohm., Prsg.' in Tüxen (1950, p. 113) is invalidly published by lacking a sufficient diagnosis (Art. 2b). The name has been validated by Rochow (1951, pp. 6, 9) who provided a sufficient diagnosis. According to Rec. 46D the correct citation of the name is *Sisymbrium officinalis* Tüxen, Lohmeyer et Preising ex von Rochow 1951.

3. The name '*Securigero securidacae-Dasypirion villosi*' was invalidly published in Cano-Ortiz, Biondi, Pinto Gomez, Del Río González & Cano (2014, p. 3226) because a bibliographical reference to the designated type had been missing (Art. 5). The name is eventually validly published with a different type by Di Pietro in Di Pietro et al. (2015, p. 82) as '*Securigero securidacae-Dasypirion villosi* Cano-Ortiz, Biondi et Cano in Cano-Ortiz & al. ex Di Pietro all. nov. hoc loco'. However, the author citation is wrong. According to Rec. 46C and Rec. 46D the correct citation of the name is '*Securigero securidacae-Dasypirion villosi* Cano-Ortiz, Biondi, Pinto Gomez, Del Río González et Cano ex Di Pietro in Di Pietro, Theurillat, Capelo, Fernández-González, Terzi, Čarni et Mucina 2015'.

4. Fjerdingsstad (1964, p. 93) described a '*Stigeoclonium tenue*-community' with a species list only. Referring to Fjerdingsstad, Arendt (1982, p. 144) provided a sufficient diagnosis and the type relevé, and thus described validly the '*Stigeoclonietum tenuis* (Fjerdingsstad 1964) ass. nov.' However, the correct citation of the new association is '*Stigeoclonietum tenuis* Fjerdingsstad ex Arendt 1982'.

Recommendation 46E

When an ineffectively published name ('*nomen ineditum*', '*nom. ined.*'; Art. 1, Note 3) or an invalid name ('*nomen invalidum*', '*nom. inval.*'; Arts. 2 through 4) or an illegitimate name ('*nomen illegitimum*', '*nom. illeg.*'; Arts. 29b and c, Arts. 31 through 34) or a name to be corrected ('*nomen corrigendum*', '*nom. corrigend.*'; Art. 44) or an inadequate name ('*nomen ineptum*', '*nom. inept.*'; Arts. 43 through 45) is cited, it is recommended to indicate the status of the name or to cite the article of the Code pertaining to the status.

Recommendation 46F

The abbreviation '*pro syn.*' ('*pro synonymo*') should be used when a name is given that was originally published merely as a synonym.

Recommendation 46G [deleted]

Recommendation 46H [deleted]

Recommendation 46I

Should a later homonym (see Arts. 31 and 32) be cited in synonymy, it should be followed by the word '*non*' and by the earlier homonym with its author citation.

Example 1

Caricetum davallianae Klečka 1930 non *Caricetum davallianae* Dutoit 1924 (see Art. 31, Example 1).

Recommendation 46J

The misinterpretation of a name (pseudonyms, see Def. X) should be indicated by citation of the misinterpreting author (with the year) preceded by the word '*sensu*' instead of the original author citation of the name. If the misinterpretation occurs in many sources, the abbreviation '*auct.*' (*auctorum*) should be given instead of '*sensu*' followed by the names of the misinterpreting authors. The original author citation should be preceded by the word '*non*'.

Example 1

The alliance '*Poterion ancistroidis* Br.-Bl. 1934', published in Meier & Braun-Blanquet (1934, p. 28) has been described initially for the low elevation calcareous cliffs of Morocco and the Betic mountains in Spain. However, the original diagnosis of the alliance contains only one provisional association for the Southern Spain, and the '*Poterion ancistroidis*' was later restricted to North Africa. Therefore, the indication of the alliance in Spain is a misinterpretation and the pseudonym is cited as '*Poterion ancistroidis auct. non* Braun-Blanquet in Meier et Braun-Blanquet 1934'.

Article 47 – Conditions of retention of the original author citation

In an alteration of the circumscription of a syntaxon without exclusion of the nomenclatural type, as well as in an alteration or extension of its diagnostic characters (character and/or differential species), the original author citation remains unaltered when the correct name of the syntaxon remains unaltered.

Article 48 – Special additions to author citations

- a. In corrections of typographic or orthographic errors (Art. 41), the name(s) of the author(s) performing the correction and the year of the publication are not given.
- b. In case of the inversion of a name (Art. 42), the abbreviation '*nom. invers.*' (*nomen inversum*'), without the names of the author(s) performing the inversion, is placed after the original author citation.

c. In corrections due to taxonomic errors (Art. 43), the name of the correcting author(s) and the year of the effective publication of the correction are placed after the original author citation and preceded by the abbreviation '*corr.*' ('*correxit*').

d. In corrections due to illegitimate, rejected and misapplied names of taxa (Art. 44), the abbreviation '*nom. corr.*' ('*nomen correctum*') is appended to the original author citation. The name of the author(s) performing the correction and the year are not given.

e. In changes of names due to the application of a different taxonomic concept of the name-giving taxon (taxa) (Art. 45), the abbreviation '*mut.*' ('*mutatum*') is appended to the original author citation, followed by the name of the author(s) performing the mutation and the year of the publication.

f. In case of the conservation of a name (Art. 52), the abbreviation '*nom. cons.*' ('*nomen conservandum*') is placed after the original author citation.

g. In case of a name with a conserved type (Art. 53), the abbreviation '*typus cons.*' ('*typus conservandum*') is appended to the original author citation.

Note 1: When there is more than one addition to the author citation, they should be listed following the order of the Articles and separated with '*et*', without the repetition of '*nom.*' between them (e.g. '*nom. invers. et corr.*').

Remark: A *nomen mutatum* cannot be corrected (see Art. 45, Note 3).

Examples

See Arts. 41 through 45, and Art. 52.

Article 49 – Author citations for nomina nova

In names that are published as avowed substitutes (*nomina nova* – see Art. 39a), the original author citation is to be inserted within brackets before the author citation of the replacement name.

Example

See Art. 39a, Example 3.

Article 50 – Author citation for a new combination of a subassociation

In an alteration of the position of a subassociation (Art. 26), the author citation of the original combination is to be inserted within brackets before the author citation of the new combination. Additions to the original author citation according to Art. 48 are to be inserted within the brackets.

With repeated alterations of the position, the author citation of the oldest combination, and only this, is to be quoted within brackets.

Article 51 – Author citation after change of rank

In changes of rank (Art. 27), the original author citation is to be inserted within brackets before the author citation of the name in its new rank. Additions to the original author citation according to Art. 48 are to be inserted within the brackets.

Examples

See Art. 27a, Example 1, and Art. 27b, Example 1.

Chapter 10. *Nomina conservanda*

Article 52 – Conservation of syntaxon names

To avoid inappropriate changes of commonly used, validly published names of syntaxa owing to strict application of the rules, some names applied in accordance with the nomenclatural type can be established as exceptions according to special criteria. These names can be protected as *nomina conservanda* (see Def. XIII, Principle IV). The adopted *nomina conservanda* as well as the rejected ones will be included in Appendix III of the Code. The author citation of the conserved name remains unaltered. However, the conservation is indicated by appending the expression '*nom. cons.*' ('*nomen conservandum*') to the author citation (see Art. 48f).

Names that are rejected according to Arts. 29b and 34, ambiguous names (Art. 36), and dubious names (Art. 37) are not eligible for becoming *nomina conservanda*.

Note 1: A conserved name of a syntaxon is conserved against:

- a. All other names at the same rank based on the same type (homotypic synonyms, see Def. X).
- b. All earlier homonyms (see Def. IX).
- c. Heterotypic synonyms (see Def. X) that are listed in Appendix III.

Note 2: The rejected earlier homonyms and homotypic synonyms of a conserved name are illegitimate names that cannot be used anymore (see Principle IV). The rejected earlier heterotypic synonyms are legitimate names that cannot be used unless they would be considered to correspond to a different syntaxon.

Note 3: A correction of a conserved name or its validly published mutation is automatically conserved in the same way as the original name.

Since the judgement on the necessity of a conserved name is subjective, authors are requested to send their proposals, accompanied by a statement of the reasons for the conservation, to the Committee for Change and Conservation of Names (CCCN) for decision (for instructions see Appendix II). The CCCN recommendation about the conservation, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature (GPN), will become binding. The accepted *nomina conservanda* will be listed in Appendix III.

Example 1

The commonly used name '*Asperulo-Fagetum* Sougnez & Thill 1959' has been conserved by the GPN Assembly against the heterotypic names '*Dentario bulbiferae-Fagetum* Hartmann 1953' and '*Festuco altissimae-Fagetum* Schlüter 1957' (Appendix III; see also Willner et al., 2011, p. 67; Gigante et al., 2019, p. 309). Therefore, for authors who consider the three names as corresponding to the same association the correct name is the '*Asperulo-Fagetum* Sougnez & Thill 1959 *nom. cons.*'. This does not preclude authors from adopting the '*Dentario bulbiferae-Fagetum*' and (or) the '*Festuco altissimae-Fagetum*' if they consider that these names correspond to associations different from the '*Asperulo-Fagetum*'.

Article 53 – Syntaxon names with a conserved type

To avoid unnecessary changes of commonly used and validly published names of syntaxa owing to strict application of the rules, with an exception of *nomina conservanda* (Art. 52), the name of a syntaxon may be preserved by choosing a nomenclatural type other than the one designated by the author or determined by the application of the rules (see Def. XIII). The author citation of a name with a conserved type remains unaltered. However, the conservation of the type is indicated by appending the expression '*typus cons.*' (*typus conservandum*) to the author citation (see Art. 48g).

Names that are rejected according to Arts. 29b and 34, ambiguous names (Art. 36), and dubious names (Art. 37) are not eligible for getting a conserved type.

Since the judgement on the necessity of a conserved type is subjective, the rejection of the type of a name and the designation of a conserved type will be regulated by the Committee for Change and Conservation of Names (CCCN). Authors are requested to send their proposals, accompanied by a statement arguing the reasons for the conservation, to the CCCN for decision (for instructions see Appendix II). The CCCN recommendation about the conservation, when ratified by the Assembly of the Working Group for Phytosociological Nomenclature, will become binding. The accepted names of syntaxa with a conserved type will be listed in Appendix III.

DIVISION IV. Provisions for the modification of the Code

Amendments of the Code and the preparation of new editions are under the responsibility of the Steering Committee of the Working Group for Phytosociological Nomenclature (GPN) of the International Association for Vegetation Science. All proposals relative to the Code have to be sent to the Secretary of GPN (see <http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Amendments.aspx>). The SC amendments, when ratified by the GPN Assembly, will be published in a new edition of the Code.

The Appendices III (*nomina conservanda*), IV (*nomina ambigua*), V (*nomina dubia*) and VII (binding decisions) will be regularly updated on the GPN website (see: <http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Appendices.aspx>)

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Author contributions

As the chair the GPN, JPT lead the discussions and the redaction. All the authors discussed and jointly wrote the whole text.

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APPENDIX I.

Guide to the correct formation of names of syntaxa

(By Stefan Rauschert[†] and Bruno de Foucault)

The following list is based on the proposals of Rauschert (1963, 1969). It contains word stems, genitives and connecting vowels of important names of genera and specific epithets in the following order:

- (a) the unaltered name,
- (b) the word stem to which are appended the terminations indicating syntaxonomic rank or the connecting vowels,
- (c) the genitive, a knowledge of which is necessary only with epithets,
- (d) the connecting vowel which is appended to the stem.

For the stems ending in 'a', 'e', 'o' or 'u', the final vowel (bracketed in the tables) is always elided. For instance, for the genus *Festuca* (unaltered name), the stem remains *Festuca* but the final vowel 'a' is elided and put between brackets: *Festuc(a)*, the addition of the termination *-ion* of the alliance rank gives *Festucion*. Similarly, the final vowels 'i', 'ia' and 'io' in the word stem are also elided but only before the termination *-ion* of the alliance rank. For instance, in *Molinia* the word stem ends with 'i' (*Molini-*) that is elided before the termination *-ion*, which gives *Molin-ion* but not before the termination *-etalia*, which gives *Molini-etalia*.

The breve (e.g. ě, ĭ, ů) indicates short vowels, and the macron (e.g. ā, ī, ū) indicates long vowels.

The names are grouped according to the final letter (printed in bold face type), and each case is numbered separately (#1 through #102). In addition, there are four categories for pseudo-compound names (#103 through #106). It is not always easy to know the gender of genera. For instance, the names ending in 'a' can be either feminine or neuter names (see #1 and #3). In case of difficulties for names not included in Appendix I, authors are invited to find out their gender after the online databases Euro-Med PlantBase (<http://www.emplantbase.org/home.html>) and The Plant List (<http://www.theplantlist.org/>).

a

1 (a) -ǎ (b) -(a)-, (c) -ae, (d) -o

(a) *Festuca*, (b) *Festuc(a)-*, (c) *Festuc(a)e*, (d) *Festuco*

Feminine names.

Note: Some names and epithets of #3 ending in *-ma* are not neuter but feminine. Therefore, they belong to #1:

Names: *Caralluma*, *Cycloloma*, *Glechoma*, *Oncostema*, *Onosma*, *Phryma*, *Psamma*, *Retama*, *Tractema* as well as compound names with *-coma*, *-gramma*, *-osma* and *-toma*.

Epithets with *-ma* as well as with *-chroma*, *-derma*, etc.: *holostoma*, *microsperma*, *polychroma*.

2

(a) -a (b) -(a)-, (c) -a, (d) -o

Indeclinable Japanese names.

Epithet: *yagara*.

3 (a) -mǎ, (b) -mǎt-, (c) -mǎtis, (d) -o

(a) *Alisma*, (b) *Alismat-*, (c) *Alismatis*, (d) *Alismato*

Neuter generic names ending in *-ma* and compound names with: *-chroma*, *-derma*, *-lemma*, *-loma*, *-nema*, *-phryma*, *-sperma*, *-stelma*, *-stema*, *-stemma*, *-stigma*, *-stoma*, *-trema*, etc.:

Aethionema, *Asyneuma*, *Comastoma*, *Corema*, *Cycloloma*, *Delosperma*, *Disphyma*, *Heliosperma*, *Neatostema*, *Oncostema*, *Phyteuma*, *Tractema*, *Tristagma*, etc.

Note: As feminine, the following names and epithets belong to #1: *Caralluma*, *Cycloloma*, *Glechoma*, *Oncostema*, *Phryma*, *Psamma*, *Retama*, *Tractema*, as well as compound names with *-coma*, *-gramma*, *-osma* and *-toma*.

In addition, this is also the case for adjectival epithets with *-ma* as well as with *-chroma*, *-derma*, etc.: *holostoma*, *microsperma*, *polychroma*.

b

4 (a) *-b*, (b) *-b-*, (c) *-b*, (d) *-o*

(a) *mahaleb*, (b) *mahaleb-*, (c) *mahaleb*, (d) *mahalebo*

c

5 (a) *-c*, (b) *-c-*, (c) *-c*, (d) *-o*

(a) *Nostoc*, (b) *Nostoc-*, (c) *Nostoc*, (d) *Nostoco*

e

6 (a) *-ē*, (b) *-(a)-*, (c) *-ēs*, (d) *-o*

(a) *Silene*, (b) *Silen(a)-*, (c) *Silenes*, (d) *Sileno*

Substantival feminine names of Greek origin.

Names: *Aloe*, *Alsine*, *Andrachne*, *Androsace*, *Anemone*, *Asphodeline*, *Atragene*, *Callitriche*, *Calycotome*, *Cardamine*, *Cassiope*, *Catananche*, *Cerithe*, *Chamaedaphne*, *Chamaepeuce*, *Chasmanthe*, *Cistanche*, *Cleome*, *Colobachne*, *Crambe*, *Danae*, *Daphne*, *Diplachne*, *Elatine*, *Eriosynaphe*, *Eudianthe*, *Halimione*, *Helxine*, *Hierochloe*, *Hippochaete*, *Hippophae*, *Homogyne*, *Hydrocotyle*, *Jasione*, *Leontice*, *Malope*, *Neottianthe*, *Obione*, *Oenanthe*, *Orobanche*, *Phryne*, *Phyllodoce*, *Pleurochaete*, *Pleurogyne*, *Schizachne*, *Statice*, *Teline*, *Tetracme*, *Triplachne*, etc.

Epithets: *alsine*, *andrachne*, *aparine*, *argemone*, *chamaejasme*, *chamaesyce*, *cynocrambe*, *elatine*, *helleborine*, *pneumonanche*, *peuce*, *stoebe*.

7 (a) *-e*, (b) *-i-*, (c) *-is*, (d) *-i*

(a) *Secale*, (b) *Secali-*, (c) *Secalis*, (d) *Secali*

In addition, true latin adjectival epithets: the neuter forms of #35 (*alpestre, campestre, lacustre, palustre, rupestre, sylvestre, terrestre*) and #60 (*acre, affine, agreste, arvense, bienne, breve, campestre, commune, dulce, edule, grande, humile, gentile, inerme, laeve, mite, molle* (but see #8), *palustre, perenne, pratense, suave, tenue, triste, turpe, viride, vulgare*, etc.).

8 (a) -e, (b) -(e)-, (c) -e, (d) -o

(a) *Cakile*, (b) *Cakil(e)-*, (c) *Cakile*, (d) *Cakilo*

Indeclinable names and epithets:

Name: *Cakile*.

Epithets: *gale, molle* (in *Schinus molle*, since the epithet does not come from the Latin adjective *mollis* but from the Quechua name of this tree).

9 (a) -ae, (c) -ae, (d) -

Epithets being the genitives of words ending in -a:

clavenae, cornucopiae, jankae, nathaliae, pontederae, salviae, tatrae, etc.

h

10 (a) -h, (b) -h-, (c) -h, (d) -o

(a) *Ceterach*, (b) *Ceterach-*, (c) *Ceterach*, (d) *Ceteracho*

Indeclinable names and epithets.

Name: *Ceterach*.

Epithet: *turbith*.

i

11 (a) -i, (b) -i-, (c) -i, (d) -o

(a) *Thlaspi*, (b) *Thlaspi-*, (c) *Thlaspi*, (d) *Thlaspio*

Indeclinable names and epithets.

Names: *Alhagi, Ammi, Muscari, Seseli, Thlaspi*.

Epithets: *alkekengi, carvi, cheiri, genipi, jonthlaspi, kali*.

12 (a) *-i*, (c) *-i*, (d) *-*

Genitives of words ending in *-us* or *-um*; only epithets.

aconiti, breynei, dilleni, fleischeri, gerardii, halleri, imperati, manescavi, matthioli, myconi, oxycedri, palinuri, parnassi, prunastri, seelosii, serpentini, tabernaemontani, teucii, thapsi, tornabeni, triumfettii, valerandi, villarii, etc.

13 (a) *-i*, (b) *-i-*, (c) *-lis*, (d) *-i*

(a) *exul*, (b) *exul-*, (c) *exulis*, (d) *exuli*

14 (a) *-i*, (b) *-i-*, (c) *-i*, (d) *-o*

(a) *metel*, (b) *metel-*, (c) *metel*, (d) *metelo*

Indeclinable names and epithets: *Gasoul*, *- metel*.

m

15 (a) *-m*, (b) *-m-*, (c) *-m*, (d) *-o*

(a) *raetam*, (b) *raetam-*, (c) *raetam*, (d) *raetamo*

16 (a) *-um*, (b) *-(o)-*, (c) *-i*, (d) *-o*

(a) *Polygonum*, (b) *Polygon(o)-*, (c) *Polygoni*, (d) *Polygono*

Names ending in *-um*.

Note: For epithets being genitives in the plural form ending in *-arum*, *-orum*, *-ium* and *-um*, see #17.

However, the following epithets in *-arum*, *-orum*, *-ium* and *-um* are nominatives, and thus they belong to #16:

-arum and *-orum*: *cammarum, cneorum, (in)decorum, (in)odorum*.

-ium: *absinthium, aegyptium, brutium, chironium, cynapium, dolopium, ephippium, gnidium, helenium, hymettium, lydium, orontium, ostruthium, polium, polyceratium, pulegium, sphondylium, strumarium, struthium, tinctorium, tragium, tripolium*.

-um: *alypum, apulum, calabrum, colonum, ischaemum, thessalum, trionum, venetum*.

17 (a) *-um*, (c) *-um*, (d) -

Epithets being genitive plural forms ending in:

-ōrum: *apricorum, carthusianorum, deorum, desertorum, dumetorum, ericetorum, lucorum, murorum, tectorum, tinctorum, verlotiorum, etc.*

Note: the following epithets are nominatives and belong to #16: *cneorum, (in)decorum, (in)odorum.*

-ārum: *cataractarum, fossarum, officinarum.*

Note: the epithet *cammarum* is a nominative and belongs to #16.

-ium: *avium, sepium.*

Note: the following epithets are nominatives and belong to #16: *absinthium, aegyptium, brutium, chironium, cynapium, dolopium, ehippium, gnidium, helenium, hymettium, lydium, orontium, ostruthium, polium, polyceratium, pulegium, sphondylium, strumarium, struthium, tinctorium, tragium, tripolium.*

-um: *bavarum, fullonum, lapponum, leporum, nemorum, oreadum, segetum.*

Note: the following epithets are nominatives and belong to #16: *alypum, apulum, calabrum, colonum, ischaemum, thessalum, trionum, venetum.*

n

18 (a) *-ēn*, (b) *-ēn-*, (c) *-ēnis*, (d) *-o*

(a) *macrosolen*, (b) *macrosolen-*, (c) *macrosolenis*, (d) *macrosoleno*

Compound names with *-lichen*, *-pyren*, *-solen*, *-splen*.

19 (a) *-ěn*, (b) *-řn-*, (c) *-řnis*, (d) *-i*

(a) *Cyclamen*, (b) *Cyclamin-*, (c) *Cyclaminis*, (d) *Cyclamini*

Names.

20 (a) *-n*, (b) *-n-*, (c) *-n*, (d) *-o*

(a) *behen*, (b) *behen-*, (c) *behen*, (d) *beheno*

Indeclinable epithets.

21 (a) *-īn*, (b) *-īn-*, (c) *-īnis*, (d) *-o*

(a) *Trigloch*, (b) *Trigloch-*, (c) *Trigloch*, (d) *Trigloch*

Compound names and epithets with *-gloch* (*argyrogloch*, *microgloch*, etc.).

22 (a) *-ōn*, (b) *-(o)-*, (c) *-i*, (d) *-o*

(a) *Onopordon*, (b) *Onopord(o)-*, (c) *Onopordi*, (d) *Onopordo*

Neuter names and epithets of Greek origin and with Greek nominative ending.

Names: *Abutilon*, *Acantholimon*, *Aconogonon*, *Acroptilon*, *Agropyron*, *Aizoon*, *Asterolinon*, *Atocion*, *Chamaenerion*, *Chiodecton*, *Cratoneuron*, *Echinopsilon*, *Eriocaulon*, *Galeobdolon*, *Goniolimon*, *Helictotrichon*, *Lycoperdon*, *Myosoton*, *Myriolimon*, *Phagnalon*, *Rhizocarpon*, *Rhododendron*, etc.

Epithets: *aizoon*, *dactylon*, *galeobdolon*, *linophyllon*.

Also, the neuter forms of adjectives ending in *-ōs* of #69: *acinon*, *alopecuron*, *calomelanon*, *distachyon*, *el(a)eagnon*, *epigejon*, *leptocladon*, etc.

23 (a) *-ōn*, (b) *-ōn-*, (c) *-ōnis*, (d) *-o*

(a) *Chrysopogon*, (b) *Chrysopogon-*, (c) *Chrysopogonis*, (d) *Chrysopogono*

Names: *Brachychiton*, *Croton*, *Endymion*, *Lysichiton*, *Sison*.

Compound names with *-chiton*, *-codon*, *-croton*, *-mecon*, *-pogon*, *-siphon*.

24 (a) *-ōn*, (b) *-ōn-*, (c) *-ōnis*, (d) *-o*

(a) *Cotyledon*, (b) *Cotyledon-*, (c) *Cotyledonis*, (d) *Cotyledono*

Compound names with *-geton*, *-geiton*, *-giton*, *-pepon*, *-stemon*.

The abbreviated form *Potam-* may be used instead of the stem *Potamogeton-* (Art. 10).

25 (a) *-ōn*, (b) *-ont-*, (c) *-ontis*, (d) *-o*

(a) *Erigeron*, (b) *Erigeront-*, (c) *Erigerontis*, (d) *Erigeronto*

Compound names and epithets with *-dracon*, *-geron*, *-odon*.

Names: *Anomodon*, *Ceratodon*, *Cynodon*, *Didymodon*, *Leontodon*, *Tetraplodon*, *Zygodon*.

Epithets: *anodon*, *trachyodon*, etc.

26 (a) *-on*, (b) *-on-*, (c) *-on*, (d) *-o*

(a) *martagon*, (b) *martagon-*, (c) *martagon*, (d) *martagono*

Indeclinable epithets.

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27 (a) *-ō*, (b) *-īn-*, (c) *-īnis*, (d) *-ī*

(a) *Plantago*, (b) *Plantagin-*, (c) *Plantaginis*, (d) *Plantagini*

Names and epithets with terminations in *-āgo*, *-īgo*, *-go*.

Names: *Albugo*, *Asperugo*, *Borago*, *Erucago*, *Ferulago*, *Filago*, *Fuligo*, *Medicago*, *Mollugo*, *Mucilago*, *Plumbago*, *Rubigo*, *Solidago*, *Tussilago*, *Ustilago*.

Epithets: *erucago*, *fabago*, *githago*, *liliago*, *selago*, *trixago*.

Names and epithets with termination in *-edo*: *Uredo*, *mucedo*; also *Arundo*.

For *Cotyledo*: see #24; for *unedo*: see #28.

28 (a) *-ō*, (b) *-ōn-*, (c) *-ōnis*, (d) *-ī*

(a) *Senecio*, (b) *Senecion-*, (c) *Senecionis*, (d) *Senecioni*

Names and epithets.

Names: *Prospero*, *Senecio*.

Epithets: *irio*, *laricio*, *morio*, *pumilio*, *unedo*.

29 (a) *-ō*, (b) *-ōn-*, (c) *-ōnis*, (d) *-o*

(a) *pepo*, (b) *pepon-*, (c) *peponis*, (d) *pepono*

Epithets: *melopepo*, *pepo*.

30 (a) *-ō*, (b) *-(u)-*, (c) *-s*, (d) *-o*

(a) *Calypso*, (b) *Calyps(u)-*, (c) *Calypsus*, (d) *Calypso*

31 (a) *-o*, (c) *-o*, (d) *-*

Indeclinable names and epithets.

Name: *Nelumbo*.

Epithets: *farnetto*, *frainetto*, *mugo*, *negundo*, *perado*, *pinsapo*, *ritro*, *stefco*.

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32 (a) *-ar*, (b) *-ar-*, (c) *-ar*, (d) *-o*

(a) *Nuphar*, (b) *Nuphar-*, (c) *Nuphar*, (d) *Nupharo*

33 (a) *-ěr*, (b) *-ěr(o)-*, (c) *-ěri*, (d) *-o*

(a) *asper*, (b) *asper(o)-*, (c) *asperi*, (d) *aspero*

Epithets: *asper*, *gibber*, *tener*.

Compound names and epithets with *-fer* or *-ger*.

Epithets: *baccifer*, *bulbifer*, *prolifer*, *laniger*, *pubiger*, *setiger*, *squamiger*, etc.

34 (a) *-ěr*, (b) *-r(o)-*, (c) *-ri*, (d) *-o*

(a) *Cotoneaster*, (b) *Cotoneastr(o)-*, (c) *Cotoneastri*, (d) *Cotoneastro*

Epithets (true Latin adjectives): *afer*, *ater*, *calaber*, *glaber*, *integer*, *macer*, *niger*, *pulcher*, *ruber*, *scaber*, *triqueter*.

Also, *oleander* as well as names and epithets ending with *-aster* (a masculine form of the Latin suffix *-astro-*).

Name: *Cotoneaster*.

Epithets: *cacaliaster*, *lupinaster*, *oleaster*, *pinaster*, *pyraaster*, etc.

Note: See also #37 for other names ending with *-aster*.

35 (a) *-ěr*, (b) *-ri-*, (c) *-ris*, (d) *-*

(a) *alpester*, (b) *alpestri-*, (c) *alpestris*, (d) *alpestri*

Epithets: *acer*, *alpester*, *campester*, *lacuster*, *paluster*, *rupester*, *sylvester*, *terrester*.

36 (a) *-ěr*, (b) *-ěr-*, (c) *-ěris*, (d) *-i*

(a) *Acer*, (b) *Acer-*, (c) *Aceris*, (d) *Aceri*

Names: *Acer*, *Cicer*, *Laser*, *Papaver*, *Siler*, *Siser*, *Tuber*.

Epithets: *cicer*, *hydropiper*, *pseudosuber*, *siler*, *suber*.

37 (a) *-er*, (b) *-ěr-*, (c) *-ěris*, (d) *-o*

(a) *Aster*, (b) *Aster-*, (c) *Asteris*, (d) *Astero*

Compound names with *-aster* [meaning 'star']: *Geaster*, etc., or *-gaster*.

Note: See also #34 for other names with *-aster*.

38 (a) *-ēr*, (b) *-ēr-*, (c) *-ēris*, (d) *-o*

(a) *dasycrater*, (b) *dasycrater-*, (c) *dasycrateris*, (d) *dasycratero*

Compound names with *-crater*.

39 (a) *-er*, (b) *-er-*, (c) *-er*, (d) *-o*

(a) *Amelanchier*, (b) *Amelanchier-*, (c) *Amelanchier*, (d) *Amelanchiero*

40 (a) *-ōr*, (b) *-ōr-*, (c) *-ōris*, (d) *-i*

(a) *minor*, (b) *minor-*, (c) *minoris*, (d) *minori*

Epithets (Latin comparatives): *elatior*, *excelsior*, *major*, etc., compound names with *-color*, and masculine 'nomina agentis': *globator*, *necator*, etc.

In addition:

Name: *Mucor*.

41 (a) *-ūr*, (b) *-ūr-*, (c) *-ūris*, (d) *-i*

(a) *robur*, (b) *robor-*, (c) *roboris*, (d) *robori*

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42 (a) *-ās*, (b) *-ād-*, (c) *-ādis*, (d) *-o*

(a) *Najas*, (b) *Najad-*, (c) *Najadis*, (d) *Najado*

Names: *Asclepias*, *Bunias*, *Dryas*, *Haloscias*, *Notothylas*, *Oreas*, *Serapias*.

Epithets: *achras*, *rhoeas*, *stoechas*.

43 (a) *-ās*, (b) *-āt-*, (c) *-ātis*, (d) *-o*

(a) *Aceras*, (b) *Acerat-*, (c) *Aceratis*, (d) *Acerato*

Compound names and epithets with *-ceras*.

Names: *Notoceras*, *Octodiceras*, etc.

Epithets: *leptoceras*, *orthoceras*, etc.

44 (a) *-ās*, (b) *-ant-*, (c) *-antis*, (d) *-o*

(a) *gigas*, (b) *gigant-*, (c) *gigantis*, (d) *giganto*

Epithets: *elephas, gigas*.

45 (a) *-ās*, (b) *-āri-*, (c) *-āris*, (d) -

(a) *mas*, (b) *mari-*, (c) *maris*, (d) *mari*

46 (a) *-ās*, (b) *-(a)-*, (c) *-ae*, (d) *-o*

(a) *cyparissias*, (b) *cyparissi(a)-*, (c) *cyparissiae*, (d) *cyparissio*

Name: *Micrasterias*.

Epithets: *asterias, characias, paralias*.

47 (a) *-as*, (b) *-as-*, (c) *-as*, (d) *-o*

(a) *fenas*, (b) *fenas-*, (c) *fenas*, (d) *fenaso*

48 (a) *-es*, (b) *-*, (c) *-is*, (d) *-o*

(a) *Isoetes*, (b) *Isoet-*, (c) *Isoetis*, (d) *Isoeto*

Compound names and epithets with *-anthes, -genes, -ides, -styles*.

Names: *Achyranthes, Adenostyles, Alyssoides, Aphyllanthes, Buglossoides, Cheilanthes, Cleistogenes, Menyanthes, Micranthes, Nymphoides, Prenanthes, Spiranthes, Trochiscanthes*, etc.

Epithets: *arctogenes, ranunculoides*, etc.

Names and epithets with the termination *-ōdes*.

Name: *Omphalodes*.

Epithets: *atherodes, botryodes, elodes, gnaphalodes, phryganodes, physalodes, sphaecodes*, etc.

In addition:

Names: *Aphanes, Misopates, Moneses*.

Epithets: *erisithales, paralianches, trichomanes*.

49 (a) *-ēs*, (b) *-(a)-*, (c) *-ae*, (d) *-o*

(a) *Phragmites*, (b) *Phragmit(a)-*, (c) *Phragmitae*, (d) *Phragmito*

Names and epithets with the Greek masculine termination *-ites*.

Names: *Galactites, Odontites, Petasites*.

Epithets: *arachnites, hesperites, myrsinites, onites, otites, pseudophragmites, tridactylites*, etc.

In addition:

Names: *Stratiotes, Trametes*.

Epithets: *cephalotes, heleonastes*.

50 (a) *-ēs*, (b) *-ēt-*, (c) *-ētis*, (d) *-i*

(a) *Abies*, (b) *Abiet-*, (c) *Abietis*, (d) *Abieti*

51 (a) *-ēs*, (b) *-ēt-*, (c) *-ētis*, (d) *-o*

(a) *Baeomyces*, (b) *Baeomycet-*, (c) *Baeomycetis*, (d) *Baeomyceto*

Compound names and epithets with *-myces*.

52 (a) *-ēs*, (b) *-ēt-*, (c) *-ētis*, (d) *-i*

(a) *teres*, (b) *teret-*, (c) *teretis*, (d) *tereti*

53 (a) *-ēs*, (b) *-ēd-*, (c) *-ēdis*, (d) *-i*

(a) *longipes*, (b) *longiped-*, (c) *longipedis*, (d) *longipedi*

Compound names and epithets with *-pes* [meaning 'foot']: *brevipes, crassipes*, etc.

54 (a) *-ēs*, (b) *-īt-*, (c) *-ītis*, (d) *-i*

(a) *Fomes*, (b) *Fomit-*, (c) *Fomitis*, (d) *Fomiti*

Compound names and epithets with *-stipes*: *longistipes*, etc.

55 (a) *-ēs*, (c) *-ēs*, (d) *-*

Only epithets of indeclinable genitives of the words ending in *-e*: *anemones, cardamines*, etc.

56 (a) *-es*, (b) *-es-*, (c) *-es*, (d) *-o*

(a) *Ribes*, (b) *Ribes-*, (c) *Ribes*, (d) *Ribeso*

57 (a) *-es*, (b) *-e-*, (c) *-um*, (d) *-i*

(a) *oreades*, (b) *oread-*, (c) *oreadum*, (d) *oreadi*

Nominative plural of *oreas*.

58 (a) *-īs*, (b) *-ī-*, (c) *-īs*, (d) *-o*

(a) *Agrostis*, (b) *Agrosti-*, (c) *Agrostis*, (d) *Agrostio*

Substantives with Greek stems ending in *-i*. Compound names and epithets with *-agrostis*, *-basis*, *-cystis*, *-opsis*, *-taxis*.

Names: *Airopsis*, *Anabasis*, *Anagyris*, *Arabidopsis*, *Atraphaxis*, *Calamagrostis*, *Cannabis*, *Cardaminopsis*, *Coris*, *Crypsis*, *Diplotaxis*, *Echinocystis*, *Eragrostis*, *Galeopsis*, *Katapsuxis*, *Lycopsis*, *Magydaris*, *Malaxis*, *Meconopsis*, *Melittis*, *Metabasis*, *Notobasis*, *Osyris*, *Oryzopsis*, *Oxybasis*, *Rhynchosinapis*, *Sinapis*, *Sparassis*, *Trocdaris*, etc.

Epithets: *calamagrostis*, *coris*, *eragrostis*, *linosyris*, etc.

59 (a) *-īs*, (b) *-īd-*, (c) *-īdis*, (d) *-o*

(a) *Phalaris*, (b) *Phalarid-*, (c) *Phalaridis*, (d) *Phalarido*

Names and epithets with stems ending in *-d*, that are primarily names and substantival adjectives of Greek origin. Compound names with *-aspis*, *-blepharis*, *-callis*, *-cephalis*, *-cuspis*, *-glottis*, *-graphis*, *-lepis*, *-meris*, *-orchis*, *-otis*, *-peltis*, *-phlyctis*, *-pholis*, *-pteris*, *-pyxis*, *-rhachis*, *-r(h)aphis*, *-seris*, *-stylis*, *-tropis*, names with terminations *-itis* or *-otis* and, in addition, adjectival compound names with *-aspis*, *-cuspis*, *-lepis*, *-peltis*.

Names: *Acis*, *Adonis*, *Anacamptis*, *Anagallis*, *Anthemis*, *Anthyllis*, *Aposeris*, *Arabis*, *Arnoseris*, *Atractylis*, *Atropis*, *Baccharis*, *Berberis*, *Campsis*, *Caucalis*, *Celtis*, *Cercis*, *Chamaecyparis*, *Chamorchis*, *Chartolepis*, *Charybdis*, *Chloris*, *Clematis*, *Coptis*, *Corydalis*, *Cystopteris*, *Dactylis*, *Dactylorchis*, *Dichostylis*, *Diotis*, *Distichlis*, *Drymocallis*, *Dryopteris*, *Drypis*, *Epipactis*, *Eranthis*, *Fimbristylis*, *Geopyxis*, *Glebionis*, *Grammitis*, *Halopeplis*, *Hedypnois*, *Hemerocallis*, *Hesperis*, *Hippuris*, *Hypochoeris*, *Iberis*, *Ionaspis*, *Iris*, *Isatis*, *Isolepis*, *Lagoseris*, *Lagotis*, *Lepidotis*, *Leucorchis*, *Libanotis*, *Liparis*, *Lotononis*, *Lychnis*, *Melomphis*, *Microstylis*, *Mycelis*, *Myosotis*, *Myrrhis*, *Onobrychis*, *Ononis*, *Orchis*, *Ormenis*, *Oxalis*, *Oxytropis*, *Pallenis*, *Parapholis*, *Paris*, *Pentaglottis*, *Peplis*, *Petrocallis*, *Petrocoptis*, *Phalaris*, *Philonotis*, *Phlomis*, *Phlyctis*, *Phyllitis*, *Physalis*, *Picris*, *Pseudorchis*, *Pteris*, *Ptychotis*, *Sideritis*, *Simethis*, *Stictis*, *Tetraclinis*, *Tetradiclis*, *Tetraphis*, *Tolpis*, *Torilis*, etc.

Epithets: *aethiopis*, *caucalis*, *cerris*, *chamaeiris*, *clematidis*, *colocynthis*, *dryopteris*, *epiglottis*, *epipactis*, *hemionitis*, *homolepis*, *hypocistis*, *lathyrus*, *libanotis*, *lonchitis*, *lychnitis*, *meleagris*, *myosotis*, *onopteris*, *oxyglottis*, *pachyrachis*, *peplis*, *picris*, *psammitis*, *rubricuspis*, *scorodotis*, *struthiopteris*, *tetraspis*, *tripteris*, *zygis*.

60 (a) *-īs*, (b) *-ī-*, (c) *-īs*, (d) -

(a) *Trientalis*, (b) *Trientali-*, (c) *Trientalis*, (d) *Trientali*

True Latin names ending in *-is* (not the adjective compound names of Greek origin in #59). Compound names and epithets with *-caulis*, *-collis*, *-cornis*, *-culmis*, *-formis*, *-glumis*, *-nervis*, *-retis*, *-rostris* and names and epithets ending in *-alis*, *-aris*, *-ensis*, *-estris*, *-īlis*, *-īlis*, *-ustris*.

Names: *Digitalis*, *Fontinalis*, *Mercurialis*, *Pedicularis*, *Physocaulis*, *Trientalis*, *Vitis*.

Epithets: *arvensis*, *acris*, *affinis*, *agrestis*, *biennis*, *brevis*, *campestris*, *communis*, *dulcis*, *edulis*, *gentilis*, *grandis*, *humilis*, *inermis*, *laevis*, *mitis*, *mollis*, *nivalis*, *palustris*, *perennis*, *pratensis*, *suavis*, *tenuis*, *tristis*, *turpis*, *victoralis*, *viridis*, etc.

61 (a) *-īs*, (b) *-īd-*, (c) *-īdis*, (d) *-i*

(a) *Bellis*, (b) *Bellid-*, (c) *Bellidis*, (d) *Bellidi*

62 (a) *-īs*, (b) *-īt-*, (c) *-ītis*, (d) *-o*

(a) *Hydrocharis*, (b) *Hydrocharit-*, (c) *Hydrocharitis*, (d) *Hydrocharito*

Compound names with *-charis*.

63 (a) *-īs*, (b) *-īd-*, (c) *-īdis*, (d) *-o*

(a) *Crepis*, (b) *Crepid-*, (c) *Crepidis*, (d) *Crepido*

Compound names with *-cnemis*: *Halimocnemis* or *-crepis*: *Hippocrepis*.

64 (a) *-īs*, (b) *-īn-*, (c) *-īnis*, (d) *-o*

(a) *Stenactis*, (b) *Stenactin-*, (c) *Stenactinis*, (d) *Stenactino*

Compound names with *-actis*.

65 (a) *-īs*, (b) *-ēr-*, (c) *-ēris*, (d) *-i*

(a) *Cucumis*, (b) *Cucumer-*, (c) *Cucumeris*, (d) *Cucumeri*

66 (a) *-īs*, (c) *-īs*, (d) -

Only epithets being genitives: *abietis*, *ajacis*, *apollinis*, *carduelis*, *dioscoridis*, *joannis*, *orphanidis*, *ottonis*, *peisonis*, *picridis*, *trichomanis*, *veris*, etc.

67 (a) *-ns*, (b) *-nt-*, (c) *-ntis*, (d) *-i*

(a) *Bidens*, (b) *Bident-*, (c) *Bidentis*, (d) *Bidenti*

Name: *Lens*.

Epithet: *ingens*.

Compound names and epithets with *-dens* or *-frons* (meaning 'side'; for *-frons* meaning 'foliage' see #68) and participles ending in *-ans* or *-ens*.

Name: *Impatiens*.

Epithets: *ambigens*, *bifrons*, *canescens*, *caulescens*, *decipiens*, *elegans*, *hians*, *natans*, *repens*, *sempervirens*, *stans*, etc.

68 (a) *-ns*, (b) *-nd-*, (c) *-ndis*, (d) *-i*

(a) *Juglans*, (b) *Jugland-*, (c) *Juglandis*, (d) *Juglandi*

Compound names and epithets with *-frons* (meaning 'foliage'; for *-frons* meaning 'side' see #67).

Epithets: *albifrons*, *latifrons*, etc.

In addition: *nefrons*.

69 (a) *-iens*, (b) *-iens-*, (c) *-euntis*, (d) *-i*

(a) *transiens*, (b) *trans-*, (c) *transeuntis*, (d) *transeunti*

70 (a) *-ōs*, (b) *-(o)-*, (c) *-i*, (d) *-o*

(a) *oxycoccos*, (b) *oxycocc(o)-*, (c) *oxycocci*, (d) *oxycocco*

Masculine and feminine names, as well as epithets of Greek origin and with Greek nominative termination, and compound names with *-capnos*, *-caulos*, *-clados*, *-phyllos*, *-stachyos*, *-uros*, etc.

Names: *Acinos*, *Apios*, *Arctostaphylos*, *Ceratocapnos*, *Loncomelos*, *Platycapnos*,

Prangos, Sarcocapnos, Sicyos, Symphoricarpos, etc.

Epithets: *acinos, alopecuros, calomelanos, distachyos, el(a)eagnos, epigejos, leptoclados, etc.*

71 (a) *-ōs*, (b) *-ōt-*, (c) *-ōtis*, (d) *-o*

(a) *Anthoceros*, (b) *Anthocerot-*, (c) *Anthocerotis*, *Anchoceroto*

Compound names and epithets with *-ceros, -keros, -seros*.

Name: *Epikeros*.

Epithet: *anacampseros*.

72 (a) *-ēps*, (b) *-īp-*, (c) *-īpis*, (d) *-i*

(a) *princeps*, (b) *princip-*, (c) *principis*, (d) *principi*

73 (a) *-ēps*, (b) *-īpīt-*, (c) *-īpītīs*, (d) *-i*

(a) *anceps*, (b) *ancipit-*, (c) *ancipitis*, (d) *ancipiti*

Compound names and epithets with *-ceps* (only in the meaning 'headed').

Names: *Claviceps, Cordyceps*.

Epithets: *anceps, biceps, curticeps, multiceps, oviceps, etc.*

For *princeps* see #72.

74 (a) *-ōps*, (b) *-ōp-*, (c) *-ōpis*, (d) *-o*

(a) *Aegilops*, (b) *Aegilop-*, (c) *Aegilopis* (d) *Aegilopo*

Names: *Aegilops, Chamaerops*.

In addition, also compound names and epithets with *-ops* (meaning 'eyed').

Names: *Echinops*.

Epithets: *cyclops, cunops, glaucops, lithops, melanops, etc.*

75 (a) *-ōps*, (b) *-ōp-*, (c) *-ōpis*, (d) *-i*

(a) *inops*, (b) *inop-*, (c) *inopis*, (d) *inopi*

76 (a) *-ūs*, (b) *-(o)-*, (c) *-i*, (d) *-o*

(a) *Scleranthus*, (b) *Scleranth(o)-*, (c) *Scleranthi*, (d) *Sclerantho*

Most names ending in *-us*.

77 (a) *-ŭs*, (b) *-ōr-*, (c) *-ōris*, (d) *-ori*

(a) *minus*, (b) *minor-*, (c) *minoris*, (d) *minori*

Neuter forms of some latin comparatives of #40.

Epithets: *elatus*, *majus*, *minus*.

78 (a) *-s*, (b) *-ōd-*, (c) *-ōdis*, (d) *-o*

(a) *Coronopus*, (b) *Coronopod-*, (c) *Coronopodis*, (d) *Coronopodo*

Compound names and epithets with *-pus* (meaning 'foot').

Names: *Aeluropus*, *Campylopus*, *Lycopus*, *Micropus*, *Ornithopus*, *Plagiopus*, *Rhizopus*, *Sphenopus*, *Streptopus*.

Epithets: *eriopus*, *lagopus*, etc.

Exceptions: *Hyssopus*, *Priapus*: see #76.

79 (a) *-s*, (b) *-ō-*, (c) *-ōis*, (d) *-o*

(a) *Rhus*, (b) *Rho-*, (c) *Rhois*, (d) *Rhoo*

80 (a) *-ŭs*, (b) *-(u)-*, (c) *-ūs*, (d) *-o*

(a) *Quercus*, (b) *Querc(u)-*, (c) *Quercus*, (d) *Querco*

81 (a) *-s*, (b) *-ont-*, (c) *-ontis*, (d) *-o*

(a) *Anodus*, (b) *Anodont-*, (c) *Anodontis*, (d) *Anodonto*

Compound names with *-odus* (meaning 'tooth'): *Anodus*, *Brachyodus*, *Polyodus*.

82 (a) *-ys*, (b) *-ŷ-*, (c) *-ŷōs*, (d) *-o*

(a) *Stachys*, (b) *Stachy-*, (c) *Stachyos*, (d) *Stachyo*

Compound names and epithets with *-bot(h)rys*, *-oxys*, *-stachys*.

Names: *Plagiobothrys*, *Cachrys*, *Halidrys*, *Ophrys*, *Phorcys*, *Phyllostachys*.

Epithets: *botrys*, *chamaedrys*, *hypopitys*.

83 (a) *-ŷs*, (b) *-ŷth-*, (c) *-ŷthīs*, (d) *-o*

(a) *Rhynchocorys*, (b) *Rhynchocoryth-*, (c) *Rhynchocorythis*, (d) *Rhynchocorytho*
Compound names with *-corys*.

84 (a) *-ŷs*, (b) *-ŷd-*, (c) *-ŷdīs*, (d) *-o*

(a) *heterochlamys*, (b) *heterochlamyd-*, (c) *heterochlamydis*, (d) *heterochlamydo*
Compound names with *-chlamys*.

t

85 (a) *-t*, (b) *-t-*, (c) *-t*, (d) *-o*

(a) *tetrahit*, (b) *tetrahit-*, (c) *tetrahit*, (d) *tetrahitō*

Indeclinable names and epithets.

Epithets: *spicant*, *tetrahit*.

u

86 (a) *-*, (b) *-(u)-*, (c) *-us*, (d) *-o*

(a) *longicornu*, (b) *longicorn(u)-*, (c) *longicornus*, (d) *longicorno*

Compound names and epithets with *-cornu*.

x

87 (a) *-āx*, (b) *-āc-*, (c) *-ācīs*, (d) *-o*

(a) *Smilax*, (b) *Smilac-*, (c) *Smilacis*, (d) *Smilaco*

Compound names and epithets with *-panax*.

Names: *Opopanax*, etc.

In addition:

Names: *Evax*, *Leptoplax*, *Styrax*.

Epithets: *donax*, *panax*, *scolopax*.

88 (a) *-āx*, (b) *-āc-*, (c) *-ācīs*, (d) *-i*

(a) *tenax*, (b) *tenac-*, (c) *tenacis*, (d) *tenaci*

Epithets: *fallax, ferax, fugax, tenax*.

89 (a) *-ĕx*, (b) *-ĭc-*, (c) *-ĭcĭs*, (d) *-i*

(a) *Carex*, (b) *Caric-*, (c) *Caricis*, (d) *Carici*

Names: *Atriplex, Emex, Ilex, Irpex, Rumex, Ulex, Vitex*.

Epithets: *frutex, ilex, imbrex, murex*.

In addition, compound names with *-plex*.

Epithets: *simplex, duplex, triplex*, etc.

90 (a) *-ĭx*, (b) *-ĭc-*, (c) *-ĭcĭs*, (d) *-i*

(a) *Salix*, (b) *Salic-*, (c) *Salicis*, (d) *Salici*

Name: *Larix*.

Epithet: *natrix*.

In addition, compound names with *-calix* or *-filix*.

Epithets: *ericalix*, etc.

91 (a) *-ĭx*, (b) *-ĭc-*, (c) *-ĭcĭs*, (d) *-o*

(a) *tetralix*, (b) *tetralic-*, (c) *tetralici*, (d) *tetralico*

Epithets: *helix, histrix, hystrix*.

92 (a) *-ĭx*, (b) *-ĭc-*, (c) *-ĭcĭs*, (d) *-i*

(a) *Tamarix*, (b) *Tamaric-*, (c) *Tamaricis*, (d) *Tamarici*

In addition, feminine forms of the '*nomina agentis*' of #40.

Epithets: *cunctatrix, necatrix*, etc.

93 (a) *-ĭx*, (b) *-ĭc-*, (c) *-ĭcĭs*, (d) *-o*

(a) *Scandix*, (b) *Scandic-*, (c) *Scandicis*, (d) *Scandico*

Name: *Phoenix*.

In addition, compound names with *-spadix*.

94 (a) *-ĭx*, (b) *-ĭch-*, (c) *-ĭchĭs*, (d) *-o*

(a) *Ulothrix*, (b) *Ulotrich-*, (c) *Ulotrichis*, (d) *Ulotricho*

For compound names and epithets with *-thrix*, change *th* with *-t*.

Name: *Cladothrix*.

Epithets: *callithrix*, *sphaerotherix*, etc.

95 (a) *-nx*, (b) *-ng-*, (c) *-ngis*, (d) *-o*

(a) *macrostyrinx*, (b) *macrostyring-*, (c) *macrostyringis*, (d) *macrostyringo*

Compound names with *-pharynx*, *-salpinx*, *-syrinx*.

96 (a) *-ōx*, (b) *-ōc-*, (c) *-ōcīs*, (d) *-i*

(a) *ferox*, (b) *feroc-*, (c) *ferocis*, (d) *feroci*

Epithets: *ferox*, *volvox*.

97 (a) *-ōx*, (b) *-ōc-*, (c) *-ōcīs*, (d) *-i*

(a) *praecox*, (b) *praecoc-*, (c) *praecocis*, (d) *praecoci*

Epithets.

98 (a) *-aux*, (b) *-auc-* (c) *-aucis*, (d) *-o*

(a) *Glaux*, (b) *Glauc-*, (c) *Glaucis*, (d) *Glauco*

Names.

99 (a) *-ŷx*, (b) *-ŷc-*, (c) *-ŷcīs*, (d) *-o*

(a) *microcalyx*, (b) *microcalyc-*, (c) *microcalycis*, (d) *microcalyco*

Compound names with *-calyx*.

Names: *Geocalyx*, etc.

100 (a) *-ŷx*, (b) *-ŷch-*, (c) *-ŷchis*, (d) *-o*

(a) *megalonyx*, (b) *megalonych-*, (c) *megalonychis*, (d) *megalonycho*

Compound names with *-onyx*.

101 (a) *-ŷx*, (b) *-ŷg-*, (c) *-ŷgis*, (d) *-o*

(a) *Pompholyx*, (b) *Pompholyg-*, (c) *Pompholygis*, (d) *Pompholygo*

Compound names with *-pteryx*.

y

102 (a) -ŷ, (b) -y-, (c) -ŷős, (d) -o

(a) *moly*, (b) *moly-*, (c) *molyos*, (d) *molyo*

Epithets: *chamaemoly*, *moly*.

Pseudo-compound names

Epithets formed from two words (first and second element) joined by a hyphen (a).

In the following lists, only the genitive is given (c). The connecting vowel is determined by the second element of the name and may be found in the # 1-102. In the following lists, the connecting vowel is only given in the first example of each subgroup (d).

103 Both elements change. The connecting vowel is present only in the second element.

The epithets are formed by a substantive nominative and an adjective nominative:

(a) *adiantum-nigrum*, (c) *adianti-nigri*, (d) *adianti-nigro*

(a) *agnus-castus*, (c) *agni-casti*; (a) *anagallis-aquatica*, (c) *anagallidis-aquaticae*; (a) *ferrum-equinum*, (c) *ferri-equini*; (a) *figus-indica*, (c) *fici-indicae*; (a) *filix-femina*, (c) *filicis-feminae*; (a) *filix-mas*, (c) *filicis-maris*; (a) *foenum-graecum*, (c) *foeni-graeci*; (a) *crista-castrensis*, (c) *cristae-castrensis*; (a) *herba-alba*, (c) *herbae-albae*; (a) *linum-stellatum*, (c) *lini-stellati*; (a) *melilotus-coerulea*, (c) *meliloti-coeruleae*; (a) *plantago-aquatica*, (c) *plantaginis-aquaticae*; (c) *ruta-muraria*, (c) *rutae-murariae*; (a) *sceptrum-carolinum*, (c) *sceptri-carolini*; (a) *spina-alba*, (c) *spinae-albae*; (a) *uva-crispa*, (c) *uvae-crispae*; (a) *vitis-idaea*, (c) *vitis-idaeae*.

The epithets are formed by an adjective nominative and a substantive nominative:

(a) *bella-donna*, (c) *bellae-donnae* (d) *bellae-donno*.

(a) *bonus-henricus*, (c) *boni-henrici*.

104 Only the first element changes. The connecting vowel is missing.

The epithets are formed by a substantive nominative and a substantive genitive:

(a) *barba-jovis*, (c) *barbae-jovis*, (d) *barbae-jovis*

(a) *bursa-pastoris*, (c) *bursae-pastoris*; (a) *capillus-veneris*, (c) *capilli-veneris*; (a) *caput-felis*, (c) *capitis-felis*; (a) *caput-galli*, (c) *capitis-galli*; (a) *caput-medusae*, (c) *capitis-medusae*; (a) *corona-sancti-stephani*, (c) *coronae-sancti-stephani*; (a) *crista-galli*, (c) *cristae-galli*; (a) *crus-galli*, (c) *cruris-galli*; (a) *dens-canis*, (c) *dentis-canis*; (a) *flos-cuculi*, (c) *floris-cuculi*; (a) *flos-jovis*, (c) *floris-jovis*; (a) *herba-venti*, (c) *herbae-venti*; (a) *morsus-ranae*, (c) *morsus-ranae*; (a) *nidus-avis*, (b) *nidi-avis*; (a) *oculus-christi*, (c) *oculi-christi*; (a) *oculus-solis*, (c) *oculi-solis*; (a) *pecten-veneris*, (c) *pectinis-veneris*; (a) *pes-caprae*, (c) *pedis-caprae*; (a) *rapum-genistae*, (c) *rapi-genistae*; (a) *sanguis-christi*, (c) *sanguinis-christi*; (a) *speculum-veneris*, (c) *speculi-veneris*; (a) *spica-venti*, (c) *spicae-venti*; (a) *spina-christi*, (c) *spinae-christi*; (a) *umbilicus-veneris*, (c) *umbilici-veneris*; (a) *uva-ursi*, (c) *uvae-ursi*.

105 Only the second element changes. The connecting vowel is present only in the second element.

The epithets are formed by a substantive genitive and a substantive nominative:

(a) *coeli-rosa*, (c) *coeli-rosae*, (d) *coeli-roso*

106 Without changes. The connecting vowel is missing. The epithets are genitives: *borisii-regis*, *equi-trojani*, *ferdinandi-coburgi*, *friderici-augusti*, *laserpitii-sileris*, *novi-belgii*, *novae-angliae*, etc.

In addition: *noli-tangere*.

Appendix II.

Guidelines for proposals to conserve or reject a syntaxon name

Proposals for *nomina ambigua* (Art. 36), *nomina dubia* (Art. 37), *nomina conservanda* (Art. 52) and conserved types (Art. 53) are to be submitted to the nomenclature section of a journal authorised by the Committee for Change and Conservation of Names (CCCN) of the Working Group for Phytosociological Nomenclature (GPN) (see

<http://iavs.org/Working-Groups/Group-for-Phytosociological->

Nomenclature/Proposals.aspx). This rule also applies to all proposals published elsewhere. In the latter case, a short summary together with a reference to the original place of publication will be accepted for proposals deemed sufficiently detailed. The submission to the authorised journal constitutes the official submission of a proposal to the CCCN. In some cases, it might be sensible to combine two or more related proposals into one.

Authors are requested to start the proposal with a full statement of the syntaxon name to be conserved or rejected, including the author citation and the nomenclatural type. For the latter, indicate between brackets if this is holotype, lectotype or neotype. In case of lectotype or neotype, an unambiguous reference to the publication is requested. In case of proposals for *nomina conservanda*, the earlier, heterotypic synonyms proposed for rejection against the conserved name and/or the earlier homonyms must be listed. Use the following symbols in front of each name: (=) for heterotypic synonyms, (≡) for homotypic synonyms and (H) for homonyms. The main text should start with a brief overview of the vegetation type in question, followed by a statement of the reasons for the conservation or the rejection of the syntaxon name. It is crucial that all pros and cons of the case are discussed, i.e. the consequences for nomenclatural stability and universality of both adoption and rejection of the proposal. Possible uncertainties in the interpretations of the ICPN should also be mentioned. Upon request, electronic copies of the relevant pages of the original diagnoses should be provided to the editor or the reviewer to facilitate the review process. For names published before 1 January 1979, an electronic copy of the lectotype or the neotype must be attached, unless these elements are a part of the proposal itself. Willner (2015), Terzi, Di Pietro & Theurillat (2017) and Theurillat, Di Pietro & Terzi (2017) may serve as guidelines how proposals could be structured.

After submission, the editor (usually a member of the CCCN) will check the formal quality of the proposal. External reviewers may also be involved to perform this task. If some information is missing or important aspects of the case have not been discussed, a revision of the proposal may be required before its acceptance for publication.

Nonetheless, there will be no evaluation at this stage of the procedure whether the proposal should be accepted or rejected.

The CCCN will discuss the published proposals at regular intervals and publish its recommendations. The final decision on whether to accept or reject a proposal will be made by the GPN Assembly according to the bylaws of the GPN working group. The accepted *nomina ambigua*, *nomina dubia*, *nomina conservanda*, and names with conserved types will be published at regular intervals in the nomenclature section of a journal authorised by the CCCN. These names will be included in Appendices III, IV, and V on the GPN website (<http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Appendices.aspx>) and in the subsequent editions of ICPN.

The present Appendix replaces the previous guidelines published by the CCCN (Willner, Theurillat, Čarni, Pallas & Weber, 2015).

Appendix III.

Conserved names (*nomina conservanda*) and names with a conserved type

In the following list conserved names (*nomina conservanda*) and names with conserved types are listed by alphabetical order in the left column, in boldface italics preceded by the proposal's number between brackets. Heterotypic synonyms against which the name is conserved are listed in the right column. The latter are the legitimate names that cannot be used unless they would be considered to correspond to a different syntaxon. Earlier homonyms and homotypic synonyms of the conserved names are also listed in the right column.

Appendix III will be updated on the website of the Working Group for Phytosociological Nomenclature (<http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Appendices.aspx>) and in the subsequent editions of ICPN.

Note: A conserved name is automatically conserved against all earlier homonyms and homotypic synonyms, even if they are not listed in this Appendix (see Art. 52).

(=) heterotypic synonyms

(≡) homotypic synonyms

(H) homonyms

(18) ***Asperulo-Fagetum*** Sougnez & Thill 1959 (=) *Dentario bulbiferae-Fagetum* Hartmann 1953

Typus: Sougnez & Thill l.c., p. 37, Rel. 42a.

(=) *Festuco altissimae-Fagetum* Schlüter 1957

Appendix IV.

Nomina ambigua

The following list includes all names rejected according to Art. 36 (*nomina ambigua*).

(16) ***Laricetum deciduae*** Bojko 1931

Typus: Bojko l.c., table on p. 132., col. 2 (= rel. no. 17).

Appendix V.

Nomina dubia

The following list includes all names rejected according to Art. 37 (*nomina dubia*).

[No syntaxon names have been rejected as *nomina dubia* so far.]

Appendix VI.

Guidelines for requests for binding decisions

Requests for a binding decision should be submitted per e-mail to the Chair of the Committee for Change and Conservation of Names (CCCN) of the Working Group for Phytosociological Nomenclature (GPN) (see <http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/Proposals.aspx>). The request should be accompanied by a short discussion of the case, preferably including pros and cons of alternative

interpretations. Electronic copies of the relevant pages of the original diagnoses should be included to facilitate the decision process. If relevant, a copy of the first valid typification of the syntaxon name and of the type itself must be included as well.

After a first screening of the request by the Chair, the CCCN would decide whether there is indeed an ambiguity in the interpretation of the Code. If this is not the case, the request is going to be declined without further evaluation and no possibility to appeal against the decision, except if they are asked for by more than one third of the GPN Assembly. Otherwise, the CCCN would discuss the case and issue a recommendation that becomes binding after the approval given by the GPN Assembly. The accepted binding decisions will be published at regular intervals in the nomenclature section of a journal authorised by the CCCN, and these decisions will be included in Appendix VII on the GPN website (<http://iavs.org/Working-Groups/Group-for-Phytosociological-Nomenclature/ICPN-Appendices.aspx>) and in the subsequent editions of ICPN. Upon request, the name(s) of the author(s) who requested the binding decision would not be revealed to the GPN Assembly nor they would be published.

Appendix VII.

Binding decisions

The following list is structured according to the articles in the Code that have a provision for a binding decision (no entries so far; see Appendix VI).

Principle II. Retained association names of the Uppsala School published before 1 January 1936

Article 1. Effectively published works

Article 2b. Sufficient original diagnosis of a name

Article 3c. Abstract units qualifying as syntaxa

Article 29b. Determination of the dominant strata

Article 40. Selection of the name-giving taxon for names published before 1 January 1979.

Article 42. Nomina inversa

Article 44. Correct taxon name of a name-giving taxon