

University of Lüneburg, Faculty of Environmental Sciences, Institute of Ecology and Environmental Chemistry, Lüneburg
State Agency for Environment and Nature Rostock, Section Nature Conservation, Rostock
University of Bremen, Department of Ecology and Evolutionary Biology, Vegetation Ecology and Conservation Biology, Bremen
Ernst-Moritz-Arndt-University, Botanical Institute and Botanical Garden, Greifswald
Uppsala University, Evolutionary Biology Centre, Department of Plant Ecology, Uppsala
University of Georgia, Geography Department, Athens
Brandenburg State Office for Environment, Potsdam

J. DENGLER; C. BERG; M. EISENBERG; M. ISERMANN; F. JANSEN; I. KOSKA; S. LÖBEL;
M. MANTHEY; J. PÄZOLT; A. SPANGENBERG; T. TIMMERMANN & H. WOLLERT

New descriptions and typifications of syntaxa within the project ‘Plant communities of Mecklenburg-Vorpommern and their vulnerability’ – Part I

Summary

This paper contains the original diagnoses of new syntaxa, typifications of existing names of syntaxa, and other decisions of nomenclatural relevance which have proved to be necessary within the project ‘Plant communities of Mecklenburg-Vorpommern and their vulnerability’. The underlying syntaxonomic concept is documented in DENGLER & BERG (2002). In BERG et al. (2001b, 2003) we have discussed in detail the syntaxonomic system as it applies to the federal state of Mecklenburg-Vorpommern in NE Germany.

In the introductory sections we deal with some methodological questions and explain the mode of presentation adopted in the special section. We follow strictly the rules of the International Code of Phytosociological Nomenclature (ICPN), but have recognised six aspects in which the present version of the ICPN is unclear or contradictory. For these cases we suggest reasonable solutions that are followed in the special section.

The special section of our work will be published in two parts. The present paper deals with nine phytosociological classes belonging to the herbaceous terrestrial vegetation (Polygono-Poetea annuae, Sisymbrietea, Stellarietea mediae, Calluno-Ulicetea, Koelerio-Corynephoretea, Festuco-Brometea, Molinio-Arrhenatheretea, Trifolio-Geranietea, Artemisietea vulgaris). Altogether 17 new syntaxa are validly published (including validations of previously used names and changes in rank). One name of a syntaxon is corrected due to a taxonomic error

Zusammenfassung

Neubeschreibungen und Typisierungen von Syntaxa im Rahmen des Projektes ‘Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung’ – Teil I

Ziel dieser Arbeit ist es, die im Rahmen des Projektes ‘Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung’ erforderlichen Neubeschreibungen, Validierungen und Typisierungen von Syntaxa sowie sonstige nomenklatorisch relevante Entscheidungen gemäß Empfehlung 1A des Internationalen Codes der Pflanzensoziologischen Nomenklatur (ICPN) durch die Publikation in einer Fachzeitschrift allgemein zugänglich zu machen. Das zugrundeliegende syntaxonomische Konzept ist in DENGLER & BERG (2002) dokumentiert, die sich ergebende syntaxonomische Gliederung in BERG et al. (2001b, 2003) ausführlich dargestellt und begründet.

In den einleitenden Kapiteln wird auf methodische Fragen eingegangen und die im speziellen Teil gewählte Darstellungsform erläutert. Die Regelungen des ICPN werden strikt befolgt. Für sechs Bereiche, in denen sich die gegenwärtige Fassung des ICPN als unklar oder widersprüchlich erweist, werden sinnvolle Präzisierungen vorgeschlagen.

Der spezielle Teil dieser Arbeit wird in zwei Teilen erscheinen. Die vorliegende erste hat neun Klassen der krautigen Vegetation grundwasserferner Standorte zum Gegenstand (Polygono-Poetea annuae, Sisymbrietea, Stellarietea mediae, Calluno-

and 151 further syntaxa are typified. Nomenclatural questions are discussed if appropriate and the reasons given when applications concerning *nomina ambigua*, *conservanda*, *inversa* or *mutata* are proposed.

The most important syntaxonomic novelties are the following: Subdivision of the Sisymbrietea into several orders, of which the Sisymbrietalia and the Conyzo canadensis-Brometalia tectorum ord. nov. occur in Central Europe – Subdivision of the Stellarietea mediae into the Aperetalia spicae-venti, the Dicranello staphylinae-Stellarietalia mediae ord. nov. and the Papaveretalia rhoeadis ord. nov. – Subdivision of the Koelerio-Corynepherea into the two subclasses Koelerio-Corynepherea subcl. nov. and Sedo-Scleranthenea subcl. nov. – Establishment of an alliance Filipendulo vulgaris-Helictotrichion pratensis all. nov. which contains floristically impoverished semi-dry grasslands in the southern Baltic area – Subdivision of the Molinio-Arrhenatheretea into the two subclasses Arrhenatherenea subcl. nov. and Molinio-Juncenea subcl. nov. – Subdivision of the Trifolio-Geranietea into the two subclasses Melampyro-Holcenea subcl. nov. and Trifolio-Geranienea subcl. nov. (containing the Origanetalia vulgaris s. str. and the Antherico-Geranietalia sanguinei ord. nov.) – Subdivision of the Artemisietea vulgaris into the four subclasses Epilobienea angustifolii, Lamio albi-Urticenea dioicae subcl. nov., Agropyreneae intermedio-repentis subcl. nov. (containing the Rubo caesii-Calamagrostietalia epigeji ord. nov. and the Agropyretalia intermedio-repentis) and Artemisienea vulgaris.

1 Introduction

The project 'Plant communities of Mecklenburg-Vorpommern and their vulnerability' (cf. BERG et al. 2001a; ABDANK et al. 2002; DENGLER & BERG 2002) is compiling a current overview of the vegetation types in this federal state of NE Germany as well as an assessment for nature conservation purposes. The classification was based on one of the world's largest data bases of vegetation relevés (cf. EWALD 2001) and by putting the Braun-Blanquet approach into unambiguous concrete terms. A team of more than a dozen scientists is working on this project, some of them since 1993. The

Ulicetea, Koelerio-Corynepherea, Festuco-Brometea, Molinio-Arrhenatheretea, Trifolio-Geranietea, Artemisietea vulgaris). Insgesamt werden 17 Syntaxa gültig neu beschrieben (incl. Validierungen und Rangstufenänderungen), eine Namenskorrektur aufgrund eines sippentaxonomischen Irrtums vorgenommen und 151 weitere Syntaxa typisiert. Bei Bedarf werden nomenklatorische Probleme erörtert und geplante Anträge an das CNC auf *Nomina ambigua*, *conservanda*, *inversa* und *mutata* begründet.

Als wichtigste syntaxonomische Neuerungen hervorzuheben sind: Gliederung der Sisymbrietea in mehrere Ordnungen, wovon die Sisymbrietalia und die Conyzo canadensis-Brometalia tectorum ord. nov. in Mitteleuropa vorkommen – Gliederung der Stellarietea mediae in die Aperetalia spicae-venti, die Dicranello staphylinae-Stellarietalia mediae ord. nov. und die Papaveretalia rhoeadis ord. nov. – Gliederung der Koelerio-Corynepherea in die beiden Unterklassen Koelerio-Corynepherea subcl. nov. und Sedo-Scleranthenea subcl. nov. – Aufstellung eines Verbandes Filipendulo vulgaris-Helictotrichion pratensis all. nov. für die floristisch verarmten Halbtrockenrasen der Klasse Festuco-Brometea im südbaltischen Raum – Gliederung der Molinio-Arrhenatheretea in die beiden Unterklassen Arrhenatherenea subcl. nov. und Molinio-Juncenea subcl. nov. – Gliederung der Trifolio-Geranietea in die beiden Unterklassen Melampyro-Holcenea subcl. nov. und Trifolio-Geranienea subcl. nov. (mit den Origanetalia vulgaris s. str. und den Antherico-Geranietalia sanguinei ord. nov.) – Gliederung der Artemisietea vulgaris in die vier Unterklassen Epilobienea angustifolii, Lamio albi-Urticenea dioicae subcl. nov., Agropyreneae intermedio-repentis subcl. nov. (mit den Rubo caesii-Calamagrostietalia epigeji ord. nov. und den Agropyretalia intermedio-repentis) und Artemisienea vulgaris.

results will be published in a two-volume monograph. The first volume includes the tables and is already available (BERG et al. 2001b) whilst the text volume will be published at the same time as this paper (BERG et al. 2003).

Our fundamental syntaxonomic revision necessitated the establishment of several new syntaxa. In some cases our nomenclatural enquiries made it clear that certain names of syntaxa in current use have not yet been validly published in terms of the International Code of Phytosociological Nomenclature (WEBER et al. 2000, in the following cited as ICPN). Consequently these syntaxa need to be validated. In

addition, it appeared to be reasonable to fix nomenclatural types with the aim of establishing a clear and stable scientific nomenclature of plant communities. A number of reasons have prompted us to publish these nomenclaturally relevant decisions in a scientific journal instead of including them in the text volume of our monograph (BERG et al. 2003):

- We did not want to 'overload' the book with nomenclatural information because it was primarily designed for local conservation practitioners.
- We regard our nomenclatural decisions as relevant for geobotanists throughout Europe.
- ICPN Recomm. 1A suggests that new names for syntaxa are not published in books.

The majority of the nomenclatural decisions necessary for BERG et al. (2003) are published in this paper. Only a few will be published separately, or have already been published: the classes *Bidentetea TX. et al. ex VON ROCHOW 1951* (KIESSLICH et al. 2003), the *Cakiletea maritimae TX. & PREISING ex BR.-BL. & TX. 1952*, and the *Ammophiletea BR.-BL. & TX. ex WESTHOFF et al. 1946* (both: ISERMANN & DENGLER in prep.), as well as some associations that are described as completely new (DENGLER & KREBS 2003; LINKE 2003). We have divided this paper into two parts. Part I contains the general section as well as the special sections on the vegetation of anhydromorphic sites with the exception of woodland. Part II is intended to be published in *Feddes Repertorium* 115 (3–4) and will include wetland-communities as well as woodland vegetation.

2 Material and methods

2.1 The syntaxa discussed

In general, the only syntaxa included in this paper are those that occur in Mecklenburg-Vorpommern. If no validly published and legitimate names were available for any of the syntaxa distinguished in BERG et al. (2001b, 2003), we are either validating existing names or – if necessary – publishing new names for them. The typifications similarly cover syntaxa occurring in the territory of the state, both correct names and syntaxonomic synonyms.

Names of syntaxa which do not occur in Mecklenburg-Vorpommern are not validated here. However, provided we could identify the illegitimacy or invalidity of such syntaxon names, the comment 'nom. illeg.' or 'nom. inval.' has been added as well as the relevant ICPN article when we use these names in the text.

2.2 The study area and the syntaxonomic system

The special section (section 4) refers to the classification of the vegetation types of Mecklenburg-Vorpommern as worked out in our project. This has been described and discussed in detail in BERG et al. (2003) and by extensive synoptic tables of all syntaxonomic ranks in BERG et al. (2001b).

The character and differential species of the newly described syntaxa refer to Mecklenburg-Vorpommern, where we have checked that our criteria have been fulfilled by means of our extensive data base. Furthermore, we checked the standard vegetation surveys of Central Europe before defining character species to separate those species which characterise a syntaxon throughout Central Europe from those which are mainly of regional importance. For just a few classes of the herbaceous xerothermic vegetation (*Sisymbrietea*, *Koelerio-Corynephoretea*, *Festuco-Brometea*, *Trifolio-Geranietea*, *Artemisieteae vulgaris*), the situation in Central Europe (and – in some cases – beyond) was taken into consideration by using a study which is based on the same methods as those used in this paper (DENGLER in prep.).

2.3 Comprehensiveness of the presentation

To keep this paper as short as possible, the reasons for the establishment of new syntaxa are only briefly explained in section 4. We have therefore hardly gone beyond the minimum formal requirements of the ICPN and have completely omitted vegetation tables. The syntaxonomic reasons and the characterisations can be found in BERG et al. (2001b, 2003) and in the further literature cited.

2.4 The syntaxonomic concept

Our syntaxonomic system (BERG et al. 2001b, 2003) is based on an extensive data base including more than 50,000 relevés from the

state territory of Mecklenburg-Vorpommern by means of a consistent concrete application of the Braun-Blanquet approach. This method has been published and described in DENGLER & BERG (2002); for a methodological discussion see also DENGLER (2003). Our method is based on the approach of BERGMEIER et al. (1990) in combination with the concept of the central syntaxon (e.g. DIERSCHKE 1994: 324). A few important points which are necessary for the understanding of the special section are mentioned here briefly:

- The classification is carried out separately for three different **structural types** of vegetation: woodlands, herbaceous vegetation (including dwarf shrubs) and one-layered cryptogam vegetation, the last of which is not considered here.
- Clear, testable criteria are used for character and differential species: The constancy of a **differential species** has to be at least twice as high as in the syntaxon from which it has to be separated. A **character species** has to fulfil this criterion compared with all other syntaxa of equal rank within the same structural type.
- Species which meet the character species criterion within several intercalated syntaxa, which is often the case, are called **transgressive character species**.
- Within each syntaxon of higher rank, one ‘**central syntaxon**’ can be described which is characterised by diagnostic species of the syntaxonomic level(s) above, but has insufficient or no character species of its own. As a result, there is no longer any need to erect informal (‘unranked’) communities.
- All homogeneous vegetation stands have been taken into account in our classification (**completeness**). So-called ‘atypical’ or ‘fragmentary’ types have not been ‘eliminated’ by field or table work – as has frequently been suggested or done by other authors.

2.5 Application of the nomenclatural rules

We have strictly followed the nomenclatural rules codified in the ICPN since we are convinced that long-term clarity and stability in the naming of syntaxa can only be achieved if the majority of phytosociologists carefully comply

with the Code. However, in certain respects the recent edition of the ICPN has proved to be unclear or even contradictory (see also DENGLER 2003: 176). In such cases we decided to apply consistently the solutions outlined below.

2.5.1 Original diagnoses of monotypic and central syntaxa

According to ICPN Art. 8 Sect. 2 character and/or differential species must be explicitly indicated in the original diagnoses of higher syntaxa after 1.1.1980. However, this obligation is not compatible with the central syntaxon concept. It regularly happens in monotypic syntaxa (e.g. an order that comprises only one alliance) that the syntaxon of the higher rank actually has character species of its own, but they do not conform with the character species criterion at the lower rank. In such cases it should be accepted as a sufficient diagnosis of a syntaxon above the association level that, instead of mentioning diagnostic species, only its characteristics as a single or as a negatively defined central syntaxon should be pointed out (cf. the new alliance in section 4.9.5).

2.5.2 Prefixes in syntaxon names

Before 1979, ecological or morphological prefixes were allowed in syntaxon names (ICPN Art. 12). However, there is no regulation in the ICPN concerning their spelling. As a result, both the hyphenated version and the single-word version are to be found in the literature – sometimes even for the same syntaxon (e.g. Xero-Brometum and Xerobrometum). For reasons of clarity and unambiguity, we generally separate such prefixes with a hyphen. We do not consider this to be an unauthorised change of name (ICPN Art. 29a) but as a permitted orthographic variant (cf. DENGLER 2003: 183).

2.5.3 Selection of lectotypes

Sometimes the only possibility when selecting the lectotype of an association is to violate either ICPN Art. 16 Sect. 2 (name-giving taxa must be included in the type relevé) or ICPN Art. 19a Sect. 2 (type relevé must be selected from the typical subassociation). The ten single relevés of the Coronopo-Matricarietum typicum in SISSINGH (1969), for example, lack the

two *Coronopus* species which can actually be found in relevés of the other subassociations described (see typification in section 4.1.1). Due to the fact that ICPN Art. 16 Sect. 2 will not be in force until 2002, we give priority in such cases to the permanent rule in ICPN Art. 19a Sect. 2 and follow it in selecting the lectotype [cf. the suggestion for improving the ICPN in DENGLER (2003: 184)].

2.5.4 Author citations for 'autonyms'

Since 1979, the name of a syntaxon of a supplementary rank that includes the type of the relevant principal rank must be formed by altering solely the rank-indicating termination (ICPN Art. 27a and 28a). The Code remains ambiguous concerning the kind of author citations that should be applied, since Art. 27a refers to Art. 51 for this question whilst Art. 28a refers to Art. 46. ICPN Art. 51 provides for an author citation with brackets whereas Art. 46 proposes a simple citation. Prof. Dr. Dr. H. E. Weber (in litt.), as chairman of the Nomenclature Commission, even supports the view that in such cases no author citation should be used at all. This interpretation is accepted, for example, by RIVAS-MARTÍNEZ et al. (2002). It seems to be based on an incorrect analogy to botanical nomenclature, where the so-called autonyms are not given an author citation of their own. This rule makes sense in botanical nomenclature, because an autonym of a taxon is usually mentioned together with its superior taxon and the author of that taxon [e.g. *Elymus repens* (L.) GOULD subsp. *repens*]. By contrast, the names of subclasses (suborders, suballiances) are normally used without first naming the syntaxon of the superior principal rank and its author citation. We therefore suggest that for reasons of clarity 'autonyms' in phytosociology should bear a bracketed author citation, as this is the case for all other syntaxa which have also evolved from a change in rank. This means that Art. 27a should be followed here.

2.5.5 Supplementary ranks in the case of syntaxon names according to Art. 35

According to ICPN Art. 28a, the name of a syntaxon of a supplementary rank that includes the type of the relevant principal rank has to be

formed by altering solely the rank-indicating termination. Therefore, the subclass of the Molinio-Arrhenatheretea that includes their type order Arrhenatheretalia should actually be named Molinio-Arrhenatheretea (cf. 4.7.2). This rule can conflict with ICPN Art. 35, as is the case in this example. According to this article, the name of a syntaxon must not be retained if it is composed of the names of two taxa, each of which corresponds to one of the two syntaxa of the next subordinate principal rank included in the original diagnosis and if a division of the superior syntaxon separates these two subordinate syntaxa. The class Molinio-Arrhenatheretea comprised the two orders Arrhenatheretalia and Molinietales in the protologue of TÜXEN (1937). BRAUN-BLANQUET (1949) assigned them to two separate classes which are reduced to subclasses by us. The rule in ICPN Art. 35 *expressis verbis* only holds for the principal ranks. Due to the inner logic of the Code, which always makes a very close connection between principal ranks and their relevant supplementary ranks, it seems adequate to us to apply ICPN Art. 35 when a class which has been correctly named is afterwards reduced to a subclass and is subordinated again under the previous, more broadly delimited class (analogous for the other supplementary ranks).

2.5.6 *Nomina dubia*

According to ICPN Art. 37, the name of an association may be rejected as a *nomen dubium* when its type relevé is considered to be so incomplete or so complex that an assignment to one of the currently distinguished associations does not seem possible. From our point of view, this regulation should be applied analogously to those associations that were validly published by the use of a synoptic table before 1979, if it can be shown that the relevant column in this table includes a considerable number of relevés that belong to different associations or even to higher syntaxa in the present system. It does not seem sensible in such cases to require a previous neotypification, since this could only be arbitrary.

2.6 Scheduled proposals to the CNC

According to the ICPN decisions relating to *nomina conservanda*, *ambigua*, *inversa* and

mutata are to be made by the CNC (*Committee on Nomina Conservanda, Ambigua, Inversa & Mutata*). In cases where we believe that such name-changes are well-founded according to the spirit of the Code, we use the *nomina proposita* but also note the currently valid names or name forms. Proposals to the CNC will be put forward simultaneously with this publication, or afterwards if this is not possible for nomenclatural reasons.

2.7 Typifications

For syntaxa not yet typified, we designate lecto- or neotypes if this is necessary for the determination of the correct name or if it is conducive to nomenclatural stability. Furthermore, an earlier typification is required according to ICPN App. IIB whenever a proposal for a *nomen conservandum*, *nomen ambiguum* or *nomen inversum* is scheduled by us. Despite our comprehensive overview of the relevant phytosociological literature, it cannot be ruled out that we may have overlooked an earlier effective typification of a certain syntaxon by another author. This risk is all the greater because in recent years the Nomenclature Commission has no longer been following its own commitment to ensure the general dissemination of new typifications (ICPN App. IIA). Such a list was last published for typifications of the year 1994 (THEURILLAT & MORAVEC 1998). If it should be shown that we have typified a syntaxon for which a type has already been effectively designated, then our typification would be superfluous and therefore ineffective (ICPN Art. 19–21).

2.8 Authorship and recommended form of citation

Responsibility for the contents of the individual syntaxa in the special part of this paper rests exclusively with the person(s) named. In the case of newly described syntaxa (including validated syntaxa and those that have undergone a change of rank), the originator(s) named form(s) the author citation according to ICPN Art. 46. This would then read '<originator> 2003'. According to ICPN Recomm. 46C, the syntaxon name, for reasons of bibliographic unambiguity, should be cited as '<originator> in DENGLER et al. 2003'.

3 Comments on the nature of the presentation in the special section

3.1 Nomenclature of taxa

So far as the nomenclature of vascular plants is concerned, we follow WISSKIRCHEN & HAEUPLER (1998) for taxa occurring in Germany and 'Flora Europaea' (TUTIN et al. 1968–1993) for all others. Bryophytes are consistently named according to KOPERSKI et al. (2000) and lichens according to SCHOLZ (2000). For this reason we do not give author citations for taxa.

3.2 Arrangement of syntaxa

The classes are delimited and arranged in accordance with BERG et al. (2001b, 2003). All other syntaxa are subordinated to these accepted class names, according to the position of their type elements.

In general, each class section begins with the syntaxa that are being described as new, are being validated, are undergoing a change of rank or are being corrected due to taxonomic errors. They are arranged beginning with the highest rank. When we present a totally new delimitation or subdivision of a class, these treatments of individual syntaxa are preceded by a paragraph headed 'general concept' in which a short explanation is given. At the end of each class section additional typifications of syntaxa (cf. section 3.6) are published arranged by decreasing rank and alphabetically within the same rank.

3.3 Names of syntaxa

The names of syntaxa belonging to ranks that are regulated by the ICPN are given in their orthographically correct form according to ICPN Art. 41. The original form of the name is also given in inverted commas, if this assists with the interpretation.

Syntaxa belonging to ranks not ruled by the ICPN (e.g. association groups) or without rank (e.g. informal communities) are cited in an unaltered form. If the author of such a unit has subordinated it to a syntaxon of a rank regulated by the ICPN we add the name of this in a standardised manner. In such cases we use square brackets, irrespective of whether and how this may have been done in the original reference.

3.4 Author citations

We do not abbreviate authors' surnames in author citations apart from those of BRAUN-BLANQUET (BR.-BL.), OBERDORFER (OBERD.) and TÜXEN (TX.). Initials of the first names are added whenever it is necessary to avoid a homonymy. If it is clear which of two or more persons with the same last name published first in the field of syntaxonomy, the names may be only supplemented by initials in the case of the other author(s) (e.g. TX. = Reinhold Tüxen, J. TX. = Jes Tüxen). Author citations consisting of more than two persons are given in an abridged form with 'et al.'

With very few exceptions, we have carefully checked all the publications to which the author citation of syntaxon names refer and have included them in our reference list. This is indicated by an asterisk (*) following the year in each author citation. If there is more than one publication by a particular author within one year, each one is differentiated by adding lower case letters.

Unfortunately it is a common feature in phytosociological literature that unfounded elements have 'slipped' into author citations or even that these are totally incorrect. Author citations with brackets, for instance, are often used for validations when 'ex'-citations would be appropriate. In such cases we use the correct form of the author citation but may add the commonly used incorrect one in square brackets and inverted commas. The mention of the emending author(s) preceded by 'em.' in cases when the delimitation of a syntaxon has been changed, as suggested by Recomm. 47A in the 2nd edition of the ICPN (BARKMAN et al. 1986), is no longer allowed, nor can it be done retrospectively since the publication of the 3rd edition of the ICPN (cf. WEBER 2001: 2). Consequently, we omit such emendation remarks from the author citations.

For syntaxa of ranks not covered by the ICPN rules or for informal communities, the reference is cited and is preceded by 'sensu'. In such cases we have not attempted to determine who used the name first since the principle of priority only applies for syntaxa of ICPN ranks.

3.5 Structure of the 'nomenclatural blocks'

Descriptions of new syntaxa and the publication of *nomina correcta* start with a short explanation as regards content. This is followed by the 'nomenclatural block' set in a smaller type size. The latter contains the nomenclaturally relevant information in a condensed way, similar to that used in DENGLER (2002) or KIESSLICH et al. (2003). Depending on the individual requirements, this block may consist of the following categories:

Protologue: Bibliographic reference to the original diagnosis (protologue) of the given syntaxon name or – in cases of changes of rank, corrections due to taxonomic errors or *nomina nova* – to its basionym¹. If the original form of the name (including the author citation) deviates from the correct one used by us, the former is documented in inverted commas.

Type: The nomenclatural type is documented here, that is to say a single published relevé in the case of a (sub-)association or the validly published name of a syntaxon of the next subordinate principal rank in the case of a higher syntaxon. It is stated in square brackets what kind of nomenclatural type it is (see section 3.7) and who designated it, unless this has already been done in the original diagnosis. If a type syntaxon is not regarded as a correct syntaxon name within the adopted syntaxonomic scheme, either because it is illegitimate or because it is a later syntaxonomic synonym, we indicate the correct syntaxon name in round brackets.

Syn.: The most important nomenclatural and syntaxonomic synonyms and other names of the same rank such as pseudonyms² and phantom names (see

¹ We use the term 'basionym' in the sense of WEBER (2003: 402) for every name on which a new name is based and the type of which is automatically adopted.

² In contrast to ICPN Recomm. 46J, we are deliberately including pseudonyms in the synonymy: As pointed out in DENGLER (2003: 185), there are only gradual differences between a syntaxon name in its original delimitation, a more or less emended version of it and, finally, a version which is changed in a way that excludes the type

3.8.5) are listed here in chronological order. In principle, each name is followed by a nomenclatural assessment (see 3.8) in square brackets.

- Incl.: Syntaxa that belong to one of the following categories are listed. They are arranged by decreasing rank and alphabetically within the same rank: 1) Syntaxa of a superior rank, if they are completely included in the given syntaxon. 2) Syntaxa of a lower rank than the given syntaxon if they are often placed elsewhere within the syntaxonomic system. 3) Syntaxa without clear indication of rank (Art. 3d; e.g. communities) or with a rank that does not comply with the ICPN (Art. 3d; e.g. association groups). 4) As an exception, concrete vegetation units which are not syntaxa in the sense of the ICPN.
- Excl.: Syntaxa of subordinate rank which are excluded from the given syntaxon in our classification, but are not excluded in the relevant literature, may be listed at this point.
- C: Character species of the given syntaxon.
- D: Differential species of the given syntaxon: In general they are valid against all syntaxa of the same rank within the next superior syntaxon. If the differential species criterion is only considered to be met in some of these cases, the syntaxa with which the respective syntaxon shares them are mentioned in round brackets.
- Note: Nomenclatural comments if needed.

3.6 Presentation of the typifications

A typification consists of two lines. In the first one, the syntaxon name to be typified is given together with an accurate reference (source: page) to its valid original diagnosis. If appropriate, the original form of the name, its basionym and/or further homotypic names are given in round brackets. In a second, indented line the selected type is given, also accompa-

element of the original diagnosis. Only the latter case, i.e. when the nomenclatural type *expressis verbis* is excluded, is a true pseudonym. According to ICPN Art. 47, all other cases must be considered to be permitted changes in the delimitation of a syntaxon, as a result of which the name and the author citation must not be altered. 'True' pseudonyms hardly exist at the association level and are rather rare at higher syntaxonomic ranks.

nied by an exact bibliographic reference. The kind of nomenclatural type (see 3.7) as well as an indication who of us is responsible for its selection is stated in square brackets.

In general, we do not discuss the typifications, since the ICPN leaves them up to the authors provided that the rules are followed. Where appropriate, previous incorrect typifications are mentioned. Furthermore, intended proposals for *nomina ambigua*, *conservanda* and *inversa* to the CNC are discussed. The most important floristic literature of the last 20 years (cf. ICPN Art. 45) has been checked to see if proposals for *nomina mutata* are justified, but they are not discussed here since the reasons should be self-evident. Finally, association names, which – within our classification – are not correct but are later syntaxonomic synonyms of other names, are assigned to their correct position.

3.7 Nomenclatural types

The following cases of nomenclatural types (short: types) are to be distinguished:

- **Holotypus:** The type has already been selected in the original diagnosis of the syntaxon, or there was only one element included (ICPN see Art. 18).
- **Holotypus (Art. 27a):** A type remains unaltered if the rank of a syntaxon changes between a principal rank and the supplementary rank belonging to it (and *vice versa*).
- **Lectotypus:** A type that has been selected from the elements included in the original diagnosis (cf. ICPN Art. 19), either by the authors mentioned or in the present paper ('hoc loco').
- **Lectotypus (Art. 20):** If the original diagnosis of a higher syntaxon includes one syntaxon of the next subordinate rank the name of which only differs by the ending, this syntaxon must be selected as lectotype.
- **Neotypus:** If only synoptic tables but no single relevés are published in the original diagnosis of a (sub-)association, another relevé must be designated as neotype. According to ICPN Art. 21 and Recomm. 21A, preference should be given to one of those relevés on which the synoptic table in the protologue was based, or – if not available – at least one from the same geographical region.

3.8 Nomenclatural assessment of the names of syntaxa

Reasons for the invalidity or illegitimacy of a syntaxon name may be manifold. In the 'no-

menclatural blocks' they are generally mentioned by making reference to the appropriate rule of the ICPN in square brackets. This is more precise and is shorter than the commonly used appositive expressions such as 'nom. inval.' or 'nom. illeg.', because they generally involve different cases. In the following paragraphs, the different breaches of the rules to which we refer in the special section are listed. If there are cross-references in the ICPN we always refer to the most detailed rule, and these are emphasised by use of bold face in the following overview. The relevant ICPN Articles are mentioned in square brackets.

3.8.1 *Nomina inedita* – not effectively published names

- **Art. 1:** The name has not been used in printed matter which is generally accessible to botanists, but has instead been included for example in a manuscript, in an unpublished hectograph or in a lecture.

3.8.2 *Nomina invalida* (including *nomina nuda* according to Arts. 7 and 8) – not validly published names

- **Art. 3b** [Art. 2d]: The name has been published provisionally.
- **Art. 3f** [Art. 2d]: A name-giving taxon is not indicated either directly or indirectly. This means that it is either missing in the assigned relevés (in the case of an association) or in the original diagnoses of the assigned syntaxa (in the case of a higher syntaxon).
- **Art. 5** [Art. 2d]: Since 1979: Nomenclatural type missing.
- **Art. 7** [Art. 2b]: Insufficient original diagnosis in the case of an (sub-)association. This means that an assigned relevé was not published in the same paper, nor was an unambiguous bibliographic reference given to one (before 1979 a synoptic table was sufficient).
- **Art. 8** [Art. 2b]: Insufficient original diagnosis in the case of a higher syntaxon. This means that no validly published syntaxon of the principal rank below this is clearly assigned, because no such syntaxon is included or an unambiguous reference to the protologue of its valid publication is missing.

3.8.3 *Nomina illegitima* – illegitimate names

- **Art. 24a:** Unauthorised change of the name of a syntaxon that includes its type element. This is the

case if it is divided up into two or more syntaxa of the same rank.

- **Art. 29c:** A name, the protologue of which contains a validly published syntaxon of the same rank or includes its type element (*nomen superfluum*).
- **Art. 31:** Later homonym.
- **Art. 32a:** Later name that is considered to be an orthographic variant of an earlier one (special case of homonymy).
- **Art. 32b:** Later name that is derived from a homotypic taxon name (special case of homonymy).
- **Art. 34a:** Name that contains an epithet in the nominative case that indicates a geographical, ecological or morphological property.
- **Art. 38:** Name of a higher syntaxon the type element of which is considered to be a *nomen dubium*.

3.8.4 Syntaxonomic synonyms

A syntaxonomic synonym is an effectively and validly published legitimate name that is founded on a different type (heterotypic synonym) than the correct earlier name, in the synonymy of which it is listed. All interpretations as syntaxonomic synonyms follow the syntaxonomic system in BERG et al. (2001b, 2003). If syntaxa are delimited in a different way, syntaxonomic synonyms themselves can become correct names (cf. ICPN Def. X). According to the type principle, those syntaxa that are only partly identical (see 3.8.6) also belong here if the type element is included.

3.8.5 Phantom names

A 'phantom name' is a name that has not been used by the person(s) named in the author citation in the stated source, either literally or in a form which is homonymous according to the regulations of ICPN. The 'cited' source may even be non-existent. MUCINA (1993a: 21) introduced the striking term 'phantom name' for such cases. They are attributions by later authors and do not have any nomenclatural significance³.

3.8.6 Partial correspondences of names

To express the partial correspondences of syntaxon names, we use the abbreviations 'p. p.', 'p. min. p.' and 'p. max. p.' (see section 3.9) after the author citation. 'p. p.' means that the syntaxon in question belongs only partly to the syntaxon in which synonymy it is listed.

³ It sometimes happens that a phantom name is unintentionally validated by a later author, simply by using it.

Provided that a name is validly published and that the case is of nomenclatural relevance, we indicate the position of its type element in our syntaxonomic system for partial correspondences. The part of the syntaxon that includes the nomenclatural type is marked as 'syntax. syn.' or 'typo incl.', whilst the other part(s) is/are marked as 'typo excl.'. It rarely happens that a later author publishes a new name for an already existing one (basonym) and unknowingly excludes the nomenclatural type of the latter in his/her description – at least within our syntaxonomic system. Such cases are indicated

with 'descr. incl., typo excl.'. The syntaxa to which the name, according to the type element, belongs are then marked as 'typo incl., descr. excl.'.

The nomenclatural assessment of a syntaxon name generally refers to its delimitation in the original diagnosis. Later expansions of its content (emendations) may be assessed additionally. They are cited with '<actual author citation> sensu <emending author(s)> p. p.' or in the case of 'real' pseudonyms with 'sensu <emending author(s)>, non <actual author citation>'.

3.9 Abbreviations used

*	= author citation which has been checked and included in the reference list
=	= assignment of a syntaxonomic synonym (within the syntaxonomic system presented here)
≡	= assignment of a homotypic syntaxon name
agg.	= aggregate (informal name of a species group)
all. nov.	= alliancia nova (newly described phytosociological alliance)
App.	= Appendix (of the ICPN)
Art.	= Article (of the ICPN)
ass. nov.	= associatio nova (newly described phytosociological association)
C	= character species
CNC	= Committee on Nomina Conservanda, Ambigua, Inversa and Mutata (of the Nomenclature Commission)
corr.	= correat/correxerunt (name of a syntaxon which has been corrected due to a taxonomic error by the subsequently named author(s))
D	= differential species
Def.	= Definition (by the ICPN)
descr. excl.	= descriptio excluso (not including the description within the given syntaxonomic system)
descr. incl.	= descriptio incluso (including the description within the given syntaxonomic system)
Ges.	= Gesellschaft (community)
H	= herb layer (only mentioned for juvenile phanerophytes)
HW	= Hochwert (latitudinal coordinate in the German grid)
ICPN	= International Code of Phytosociological Nomenclature. 3rd edition (WEBER et al. 2000)
MTB	= Messtischblatt (Sheet number of a German topographical map, scale 1 : 25,000)
nom. amb. propos.	= nomen ambiguum propositum (name of a syntaxon which is proposed to be rejected because of contradictory interpretations)
nom. cons. propos.	= nomen conservandum propositum (name of a syntaxon which is proposed to be protected against an earlier syntaxonomic synonym)
nom. corr.	= nomen correctum (name of a syntaxon which is corrected due to a taxonomic error)
nom. dub.	= nomen dubium (name of an association which is rejected due to the incompleteness or complexity of its type-relevé, or name of a superior syntaxon whose type-element is considered to be a nomen dubium)
nom. illeg.	= nomen illegitimum (illegitimate name of a syntaxon)
nom. inval.	= nomen invalidum (not validly published name of a syntaxon)
nom. invers. propos.	= nomen inversum propositum (name of a syntaxon in a proposed reverse sequence)
nom. mut. propos.	= nomen mutatum propositum (name of a syntaxon in the proposed form adapted to the current taxonomic nomenclature)
ord. nov.	= ordo nova (newly described phytosociological order)
p. max. p.	= pro maximo parte (to the greatest extent)
p. min. p.	= pro minimo parte (to the smallest extent)
p. p.	= pro parte (partly)
Recomm.	= Recommendation (of the ICPN)

rel.	= relevé number
RW	= Rechtswert (longitudinal coordinate in the German grid)
S	= shrub layer
s. str.	= sensu stricto (in the strict sense; informal addition to a name of a syntaxon)
Sect.	= Section (of an ICPN Article)
sensu auct.	= sensu auctorum (in the sense of different authors)
stat. nov.	= status novus (newly described syntaxon which arose from a change in rank of another syntaxon)
subcl. nov.	= subclassis nova (newly described phytosociological subclass)
T	= tree layer
tab.	= (phytosociological) table
typo excl.	= typo excluso (not including the nomenclatural type within the given syntaxonomic system)
typo incl.	= typo incluso (including the nomenclatural type within the given syntaxonomic system).

4 The individual syntaxa

4.1 *Polygono-Poetea annuae* RIVAS-MARTÍNEZ 1975

4.1.1 Typifications

Polygono arenastrum-*Poetea annuae* Tx. in GÉHU et al. 1972*: 6 corr. RIVAS-MARTÍNEZ et al. 1991*: 198 (original form: *Polygono avicularis*-*Poetea annuae*):

Saginion procumbentis Tx. & OHBA in GÉHU et al. 1972*: 6. [lectotypus DENGLER & WOLLERT hoc loco]

Polygono-Coronopion SISSINGH 1969*: 180; *Coronopo-Matricarietum* SISSINGH 1969*: 181 [lectotypus DENGLER & WOLLERT hoc loco]

Bryo argentei-*Saginetum procumbentis* DIEMONT et al. 1940* nom. invers. propos. (original form: *Sagino-Bryetum argentei*): DIEMONT et al. (1940: tab. 8, rel. 11) [lectotypus DENGLER & WOLLERT hoc loco] – Being a vascular plant, *Sagina procumbens* belongs to a higher stratum than the moss *Bryum argenteum*. For this reason, the inversion of the name in accordance with ICPN Art. 42 is proposed.

Coronopo-Matricarietum SISSINGH 1969*: SISSINGH (1969: tab. 1, rel. 6) [lectotypus DENGLER & WOLLERT hoc loco] – Regarding the selection of the lectotype, see section 2.5.3. This name thus becomes a later syntaxonomic synonym of the *Poetea annuae* FELFÖLDY 1942*.

Hyoscyamo nigri-Malvetum neglectae AICHINGER 1933*: AICHINGER (1933: tab. 14, rel. 2) [lectotypus DENGLER & WOLLERT hoc loco]

Poetea annuae FELFÖLDY 1942*: FELFÖLDY (1942: tab. 17, rel. 5) [lectotypus DENGLER & WOLLERT hoc loco]

Polygonetum avicularis FELFÖLDY 1942*:

FELFÖLDY (1942: tab. 18, rel. 3) [lectotypus DENGLER & WOLLERT hoc loco] – The name of the association most probably refers to the microspecies *Polygonum arenastrum* of the *P. aviculare* complex. Since we regard the name as a syntaxonomic synonym of the *Poetea annuae* FELFÖLDY 1942*, its correction according to ICPN Art. 43 does not seem necessary.

Poo annuae-Coronopetum squamati (OBERD. 1957*) GUTTE 1966*:

BRANDES & BRANDES (1996: tab. 6, rel. 5) [neotypus DENGLER & WOLLERT hoc loco]

Rumici-Spergularietum HÜLBUSCH 1973*:

HÜLBUSCH (1973: tab., rel. 10) [lectotypus DENGLER & WOLLERT hoc loco] – Regarding the selection of the lectotype, see section 2.5.3.

4.2 *Sisymbrietea* KORNECK 1974 nom. cons. propos.

4.2.1 *Conyzo canadensis*-*Brometalia tectorum* (PASSARGE 1988) WOLLERT & DENGLER ord. nov. hoc loco

PASSARGE (1988) was the first Central European author who supported the point-of-view that those ruderal communities dominated by annual plants which grow at sites with low humus content should be separated from the order *Sisymbrietalia* J.TX. ex GÖRS 1966* nom. cons. propos. He accordingly proposed assigning them to the already existing Mediterranean order *Brometalia rubenti-tectorum*. There is no doubt about communities of the *Brometalia rubenti-tectorum* being found in analogous sites, but their floristic composition,

apart from *Bromus tectorum*, differs greatly from the syntaxa of Central Europe (see RIVAS-MARTÍNEZ & IZCO 1977). For this reason we recommend the assignment of the corresponding communities in temperate Europe to a separate order. This order thus contains the ruderal communities dominated by annual plants in the temperate zone that occur at sites with a low nitrogen content. The Salsolion ruthenicae PHILIPPI 1971* is the only alliance known at present. Differing from usage in the syntaxonomic literature, we separate this alliance (and hence the order) not primarily on the basis of chorological aspects but mainly as a result of edaphic conditions. Accordingly we assign the emended version of the Linario-Brometum tectorum R.KNAPP 1961* as the central association of this alliance (cf. DENGLER 2001b; DENGLER & WOLLERT in BERG et al. 2003).

Protologue: 'Conyzo-Bromenalia tectorum' (PASSARGE 1988: 196)

Type: Conyzo-Bromion tectorum PASSARGE 1988* ['1978'] (= Salsolion ruthenicae PHILIPPI 1971*) [holotypus (Art. 27 a)]

Syn.: Sisymbrietalia J. TX. ex GÖRS 1966* sensu auct. p. p. [typo excl.]

Brometalia rubenti-tectorum RIVAS-MARTÍNEZ & IZCO 1977* sensu PASSARGE 1996* p.p. [typo excl.]
Eragrostietalia J.TX. ex POLI 1966 sensu KORNECK 1974* p. p., MUCINA 1993b* p. p. [typo excl.]

C: *Chaenorhinum minus*, *Chenopodium botrys*, *Corispermum marshalli*, *Digitaria sanguinalis*, *Salsola kali* subsp. *tragus*, *Senecio viscosus*

D: *Arenaria serpyllifolia* agg., *Bromus tectorum*, *Setaria viridis*

Note: The interpretation of the suborder Conyzo-Bromenalia tectorum PASSARGE 1988* as a *nomen invalidum*, as proposed by THEURILLAT & MORAVEC (1991: 208), is not accepted. PASSARGE (1988) assigns two alliances to this suborder, and designates one of them ('Conyzo-Bromion tectorum PASSARGE 1978') as the nomenclatural type. It is irrelevant for the validity of the description that the reference 'PASSARGE 1978' is missing in the reference list of the original diagnosis. The author assigns a validly published association to this alliance as a nomenclatural type, which validates the alliance.

4.2.2 Bromo tectorum-Corispermetum leptopteri SISSINGH & WESTHOFF ex SISSINGH 1950 nom. corr. DENGLER hoc loco

Protologue: '*Bromus tectorum-Corispermum hyssopifolium*-Associatie (KRUSEMAN 1941) SISSINGH et WESTHOFF 1946' (SISSINGH 1950: 109)

Type: SISSINGH (1950: tab. 34, rel. 10) [lectotypus DENGLER & WOLLERT hoc loco]

Note: This correction of the name was proposed in DENGLER (2002: 67). For purely formal reasons, this revision did not take effect because between submission and publication of the manuscript, the 3rd edition of the ICPN was published and could not be taken into account. In the 3rd edition, Art. 43 Sect. 2 stipulates that the correction of a name 'on or after 1.1.2002 must be indicated by means of the words "nom. corr. hoc. loco"', whereas the correction in DENGLER (l.c.) was indicated only with 'corr. hoc. loco'. For this reason, the correction is repeated here, though so far as the reasons and the correct author citation are concerned we refer to the publication of DENGLER (l.c.).

4.2.3 Typifications

Chenopodietea BR.-BL. in BR.-BL. et al. 1952*: 53:
Chenopodietalia BR.-BL. in BR.-BL. et al. 1936*: 11 [lectotypus (Art. 20)] – The name of this class thus becomes an older syntaxonomic synonym of the Sisymbrietea KORNECK 1974* and according to the principle of priority it should replace the name Sisymbrietea KORNECK 1974*. However, because the original diagnosis of Chenopodietea contained communities of the Sisymbrietea as well as considerable portions of the recent classes of Bidentetea TX. et al. ex VON ROCHOW 1951*, Stellarietea mediae TX. et al. ex VON ROCHOW 1951* and Artemisietea vulgaris TX. et al. ex VON ROCHOW 1951*, and because the re-introduction of this as the correct name for the substantially restricted version of the class from the annual ruderal communities on sites with deep ground-water levels would give rise to continual misinterpretations, we propose to reject the name Chenopodietea BR.-BL. in BR.-BL. et al. 1952* as a *nomen ambiguum*. At the same time, we are applying to protect the more usual name Sisymbrietea KORNECK 1974* (also partly cited in the literature with the incorrect authors GUTTE & HILBIG 1975*) as a *nomen conservandum*.

- Chenopodietalia BR.-BL. ex BR.-BL. et al. 1936*: 11: Chenopodion muralis BR.-BL. ex BR.-BL. et al. 1936*: 12 [lectotypus DENGLER, MANTHEY & WOLLERT hoc loco]
- Chenopodietalia albi TX. & LOHMEYER ex VON ROCHOW 1951*: 6 nom. illeg. [Art. 32a]: Sisymbrium officinalis TX. et al. ex VON ROCHOW 1951*: 6 [lectotypus DENGLER, MANTHEY & WOLLERT hoc loco]
- Sisymbrietalia J.TX. ex GÖRS 1966*: 530 nom. cons. propos.: Sisymbrium officinalis TX. et al. ex GÖRS 1966*: 530 (= Sisymbrium officinalis TX. et al. ex VON ROCHOW 1951*) [lectotypus (Art. 20)] – We are applying to protect this name in current use against names which should replace it according to the principle of priority, the Chenopodio-Urticetalia LIBBERT 1932* (cf. DENGLER 2002: 68) and the Chenopodietalia BR.-BL. ex BR.-BL. et al. 1936*.
- Atriplici-Sisymbrium HEJNÝ 1978*: 268: Sisymbrio-Atriplicetum oblongifoliae OBERD. 1957*: 42 (= Atriplicetum nitentis SLAVNÍČ 1951*) [lectotypus DENGLER & WOLLERT hoc loco] – Direct bibliographic references of the original diagnosis of the associations assigned to the alliances are missing in HEJNÝ (1978). However, the author quotes GUTTE (1972), where some of the references are included. In this respect the publication of the alliance is regarded as valid.
- Brometum sterilis GÖRS 1966*: 534: GÖRS (1966: tab. 13, rel. 4) [lectotypus DENGLER & WOLLERT hoc loco]
- Chenopodietum botryos SUKOPP 1971*: SUKOPP (1971: tab. 4, rel. 15) [lectotypus DENGLER & WOLLERT hoc loco] – This name thus becomes a later syntaxonomic synonym of the Bromo tectorum-Corispermetum leptopteri SISSINGH & WESTHOFF ex SISSINGH 1950* corr. DENGLER (see section 4.2.2).
- Chenopodietum stricti (OBERD. 1957*) PASSARGE 1964*: 78: PREISING et al. (1995: 59, rel. ‘Stadtgebiet von Braunschweig’) [neotypus DENGLER & WOLLERT hoc loco]
- Conyza canadensis-Lactucetum serriolae LOHMEYER ex OBERD. 1957*: 44 nom. mut. propos. (original form: Erigeronto-Lactucetum): MUCINA (1978a: tab. 2, rel. 7) [neotypus DENGLER & WOLLERT hoc loco] – The neotypification by MUCINA (1978b: 812) is not effective because of a bibliographic error by the author. He selected rel. 7 from tab. 1 in MUCINA (1978a), but this is a synoptic table.
- Descurainietum sophiae PASSARGE 1959*: 46 nom. mut. propos. (original form: Sisymbrietum sophiae):

Descurainia sophia 3, *Convolvulus arvensis* 2, *Sisymbrium officinale* 2, *Bromus sterilis* 1, *Cap-sella bursa-pastoris* 1, *Chenopodium album* 1, *Conyza canadensis* 1, *Elymus repens* 1, *Equisetum arvense* 1, *Poa pratensis* agg. 1, *Taraxacum* sect. *Ruderalia* +, *Ballota nigra* subsp. *nigra* r, *Senecio vulgaris* r; number of species 13, relevé area 4 m², total cover 70%, East Lower Saxony – relevé taken from BRANDES (1990: tab. 6, rel. 2) [neotypus DENGLER & WOLLERT hoc loco] – KREH (1935) himself has not given the name ‘Sisymbrietum sophiae KREH 1935’ that is often used in the literature. The relevé that is obviously referred to is entitled ‘3. Besiedlungswelle Überwinterndeinjährige’ (l.c.: 83). The use of this name and that of *nomina nova* according to KREH (1935) respectively thus actually represent new publications of that association. What appears to be the earliest validly published name of the association is the name here typified, which PASSARGE (1959) published with reference to KREH (1935).

- Hordeetum murini LIBBERT 1932*: LIBBERT (1932: tab. 6, rel. 4) [lectotypus DENGLER & WOLLERT hoc loco]
- Linario-Brometum tectorum R.KNAPP 1961*: KNAPP (1961: tab. 7, rel. 8) [lectotypus DENGLER & WOLLERT hoc loco]
- Plantagini-Corispermetum elongatae PASSARGE 1964*: 84: PASSARGE (1957b: tab. 5, rel. 7) [lectotypus DENGLER & WOLLERT hoc loco] – This name thus becomes a later syntaxonomic synonym of the Bromo tectorum-Corispermetum leptopteri SISSINGH & WESTHOFF ex SISSINGH 1950* corr. DENGLER (see section 4.2.2).

4.3 Stellarietea mediae TX. et al. ex VON ROCHOW 1951

4.3.1 General concept

Differing from other recent classifications (e.g. HÜPPE & HOFMEISTER 1990; RENNWALD 2002), the class *Stellarietea mediae* is divided into three orders: *Aperetalia spicae-venti*, *Dicranello staphylinae-Stellarietalia mediae* and *Papaveretalia rhoeadis*. The first order *Aperetalia spicae-venti* J.TX. & TX. in MALATO-BELIZ et al. 1960* (e.g. RENNWALD 2002) comprised weed associations growing on more or less acid soils free of carbonates. It is now divided into two orders. The first one (*Aperetalia spicae-venti* s. str.) comprises associations that grow on soils poor in bases and with strong acidity, whereas the second one (*Dicranello staphylinae-Stellarietalia mediae*)

contains syntaxa growing on base-rich soils with moderate acidity. This division gives a better ecological and floristic characterisation. The third order, which is characteristic of soils rich in carbonate, is equivalent to the recent classifications mentioned above.

4.3.2 Dicranello staphylinae-Stellarietalia mediae MANTHEY ord. nov. hoc loco

This is the central order of the class Stellarietea mediae. It comprises weed syntaxa that are characterised by the absence of floristic indicators both for very acidic and for alkaline soils (see MANTHEY 2001). Just two bryophytes are at least two times more frequent than in the other Central European orders, and they can thus be recognised as character species. Several species-poor syntaxa that were described without character species below the class rank (so called basal or derivate communities) can be assigned to this central order. According to current knowledge, the alliances Aphanion arvensis J.TX. & TX. in MALATO-BELIZ et al. 1960* (as delimited by MANTHEY in BERG et al. 2003) and Oxalidion europaeae PASSARGE 1978a* belong to this order.

Type: Aphanion arvensis J.TX. & TX. in MALATO-BELIZ et al. 1960*:146 [holotypus]

Syn.: Chenopodietalia BR.-BL. ex BR.-BL. et al. 1936* p. min. p. [typo excl.]

Chenopodietalia albi TX. & LOHMEYER ex VON ROCHOW 1951* p. p. [typo excl.; Art. 32a]

Aperetalia spicae-venti J.TX. & TX. in MALATO-BELIZ et al. 1960* p. p. [typo excl.]

Polygono-Chenopodietalia J.TX. ex PASSARGE 1964* p. p. [typo excl.]

Sperguletalia arvensis HÜPPE & HOFMEISTER 1990* p. p. [Art. 5, 29c]

Solano nigri-Polygonetalia convolvuli (SIS-SINGH in WESTHOF et al. 1946*) O.DE BOLÒS 1962 sensu RIVAS-MARTÍNEZ 2002* [Art. 8]

Incl.: Solano-Polygonetalia SISSINGH in WESTHOFF et al. 1946* p. min. p. [Art. 8]

C: *Dicranella staphylina*, *Leptobryum pyri-forme*

4.3.3 Papaveretalia rhoeadis HÜPPE & HOFMEISTER ex MANTHEY ord. nov. hoc loco

As proposed by HÜPPE & HOFMEISTER (1990), all weed syntaxa growing on carbonate-rich soils were combined in this order. The syn-

taxon is characterised by an important number of character species (see HÜPPE & HOFMEISTER 1990 and below). Within Central Europe it contains the alliances Caucalidion TX. ex OBERD. 1957* and Veronico-Euphorbion SIS-SINGH ex PASSARGE 1964*.

Type: Caucalidion TX. ex OBERD. 1957*: 25 [holotypus]

Syn.: Secalietalia BR.-BL. 1931* p. p. [Art. 3f, 8]
Chenopodietalia BR.-BL. ex BR.-BL. et al. 1936* p. min. p. [typo excl.]

Secalietalia BR.-BL. ex BR.-BL. et al. 1936* p. p. [Art. 3f]

Secali-Violetalia arvensis BR.-BL. & TX. 1943* [Art. 3f, 8]

Secali-Violetalia arvensis BR.-BL. & TX. ex SISSINGH in WESTHOFF et al. 1946* [Art. 3f]

Centaureetalia cyani TX. et al. ex VON ROCHOW 1951* nom. amb. propos. et dub. [typo. incl., descr. excl.; Art. 38]

Chenopodietalia albi TX. & LOHMEYER ex VON ROCHOW 1951* p. p. [typo excl.; Art. 32a]

Polygono-Chenopodietalia J.TX. ex PASSARGE 1964* p. p. [typo excl.]

Papaveretalia rhoeadis HÜPPE & HOFMEISTER 1990* [Art. 5]

Stachyetalia annuae RIES 1992 p. max. p. [Art. 5, 8]

Centaureetalia cyani TX. et al. in TX. 1950* sensu MUCINA 1993b* [Art. 8]

C: *Aethusa cynapium*, *Anagallis arvensis*, *Euphorbia helioscopia*, *Fumaria officinalis*, *Galium spurium*, *Lamium purpureum* var. *incisum*, *Legousia hybrida*, *Papaver rhoeas*, *Sherardia arvensis*, *Silene noctiflora*, *Sinapis arvensis*, *Sonchus arvensis* subsp. *arvensis*, *Sonchus asper*, *Sonchus oleraceus*, *Thlaspi arvense*, *Veronica agrestis*, *Veronica opaca*, *Veronica persica*, *Veronica polita*
D: *Tussilago farfara*, *Convolvulus arvensis*

Note: The name that actually has priority, Centaureetalia cyani TX. et al. ex VON ROCHOW 1951*, is ambiguous in two respects: firstly, it refers to cereal associations both in the original version (TÜXEN 1950) and in the validation (VON ROCHOW 1951) and is contrasted with the Chenopodietalia albi TX. & LOHMEYER ex VON ROCHOW 1951* (root-crop and annual ruderal communities). In this original concept, both orders included communities from strongly acidic to alkaline soils. By contrast, recent classifications (e.g. HÜPPE & HOFMEISTER 1990; MUCINA 1993b; RENNWALD 2002; RIVAS-MARTÍNEZ 2002; MANTHEY in BERG et al. 2003) are

based on a gradient of base supply and are incompatible with the original concept of TÜXEN (1950). Even if a successful typification were made, this name would give rise to continuous misinterpretation. For instance, MUCINA (1993b) recommended the name *Centaureetalia cyani* TX. et al. in TX. 1950* for the order of weed communities growing on base-rich, alkaline soils, even though *Centaurea cyanus* is more frequent on acidic fields (compare MANTHEY 2001)⁴. Secondly, the only validly published alliance included in the valid publication of the order *Centaureetalia cyani* (VON ROCHOW 1951: 6), which therefore must be selected as lectotype, is ambiguous. It is the *Agrostidion spicae-venti* TX. ex VON ROCHOW 1951*, which is described in the paper by TÜXEN (1950) as an alliance of weed communities from strong to weak acidic sandy to loamy soils (l.c.: 25). In her paper VON ROCHOW unintentionally validates the alliance. The only association in this alliance, the *Lathyro aphaci-Agrostietum spicae-venti* VON ROCHOW 1951*, automatically becomes the holotype. In this association acidophytic species are largely absent. The relevés in the synoptic table seem to belong partially to the alliances *Veronico-Euphorbion* SISSINGH ex PASSARGE 1964* and *Caucalidion* TX. ex OBERD. 1957* in the order *Papaveretalia rheoadis*. Due to the discrepancy between the description and the type location, the name of the order should be rejected as a *nomen ambiguum*. Because VON ROCHOW (1951) did not publish single relevés, it is not possible to assign the type association clearly to one alliance in the present classification. For this reason we consider the *Lathyro aphaci-Agrostietum spicae-venti* VON ROCHOW 1951* as a *nomen dubium* (cf. section 2.5.6). The higher syntaxa typified by the association according to ICPN Art. 38 thus become *nomina dubia* as well.

⁴ The typification of the *Centaureetalia cyani* TX. et al. in TX. 1950* with the *Caucalidion lappulae* TX. 1950* by MUCINA (1993a: 113) is illegitimate because both names are published invalidly according to ICPN Art. 8.

4.3.4 Typifications

- Stellarietea mediae* TX. et al. ex VON ROCHOW 1951*: 6:
Centaureetalia cyani TX. et al. ex VON ROCHOW 1951*: 6 [lectotypus MANTHEY & DENGLER hoc loco]
- Aperetalia spicae-venti* J.TX. & TX. in MALATO-BELIZ et al. 1960*: 146:
Arnosseridion minimae MALATO-BELIZ et al. 1960*: 145 (= *Scleranthion annui* KRUSEMAN & VLIENER 1939*) [lectotypus MANTHEY hoc loco]
- Centaureetalia cyani* TX. et al. ex VON ROCHOW 1951*: 6:
Agrostidion spicae-venti TX. ex VON ROCHOW 1951*: 6 [lectotypus MANTHEY hoc loco] – This lectotype selection is the only one possible, because the second alliance mentioned in the original diagnosis of the order, the *Caucalidion lappulae* TX. 1950*, is not validly published [ICPN Art. 8]. Nor is it validated by VON ROCHOW (1951), because the only association, the ‘*Lathyretum aphaci*’ KUHN 1937*, is a phantom name.
- Polygono-Chenopodietalia* J.TX. ex PASSARGE 1964*: 87:
Spergulo-Erodion J.TX. ex PASSARGE 1964*: 88 [lectotypus MANTHEY hoc loco]
- Aperion spicae-venti* TX. ex OBERD. 1957*: 18:
Teesdalia-Arnoseridetum OBERD. 1957*: 18 [lectotypus MANTHEY hoc loco] – The author citation ‘TX. 37’ as used by OBERDORFER (1957) for the association is not justified since no such association is included in TÜXEN (1937).
- Aphanion arvensis* J.TX. & TX. in MALATO-BELIZ et al. 1960*: 146:
Alchemillo arvensis-Matricarietum chamomillae TX. 1937*: 18 [lectotypus MANTHEY hoc loco]
- Caucalidion* TX. ex OBERD. 1957*: 25:
Caucalido-Adonidetum TX. ex OBERD. 1957*: 30 [lectotypus MANTHEY hoc loco]
- Oxalidion europaeae* PASSARGE 1978a*: 148:
Galeopsio-Chenopodietum OBERD. 1957*: 60 [lectotypus MANTHEY hoc loco]
- Spergulo-Erodion* J.TX. ex PASSARGE 1964*: 88:
Digitario-Chenopodietum albi PASSARGE 1964*: 89 [lectotypus MANTHEY hoc loco] – The relevés underlying the synoptic table in the protologue of this association in PASSARGE (1964) seem to belong partly to the *Scleranthion annui-Arnoseridetum minimae* TX. 1937* and to the *Spergulo arvensis-Chrysanthemetum segetum* BR.-BL. & DE LEEUW ex TX. 1937* (both in the alliance *Scleranthion annui* KRUSEMAN & VLIENER 1939*).

- Veronico-Euphorbion SISSINGH ex PASSARGE 1964*: 95:
 Veronico agrestis-Fumarietum TX. in J.TX. 1955*: 84 (= Veronico-Lamietum hybridi KRUSEMAN & VIEGER 1939*) [lectotypus MANTHEY hoc loco] – The typification of the alliance with the Mercurialietum annuae KRUSEMAN & VIEGER 1939* by MUCINA (1993b: 118) was not legitimate since this association was neither validly published by KRUSEMAN & VIEGER (1964) nor included in the protologue of PASSARGE (1964).
- Scleranthion annui KRUSEMAN & VIEGER 1939*: 331: [≡ Scleranthion annui (KRUSEMAN & VIEGER 1939*) SISSINGH in WESTHOFF et al. 1946*]: Papaveretum argemones (LIBBERT 1932*) KRUSEMAN & VIEGER 1939*: 343 nom. cons. propos. [lectotypus MANTHEY hoc loco]
- Aphano arvensis-Matricarietum chamomillae TX. 1937*: 18 nom. mut. propos. (original form: Alchemillo arvensis-Matricarietum chamomillae):
Bryum rubens 2a, *Cirsium arvense* 2a, *Elymus repens* 2a, *Tripleurospermum perforatum* 2a, *Bryum argenteum* 2m, *Dicranella staphylina* 2m, *Apera spica-venti* 1, *Aphanes arvensis* 1, *Myosotis arvensis* 1, *Plantago major* 1, *Poa annua* 1, *Sonchus arvensis* 1, *Viola arvensis* subsp. *arvensis*, *Atriplex patula* +, *Chenopodium album* +, *Conyza canadensis* +, *Gnaphalium uliginosum* +, *Matricaria recutita* +, *Riccia glauca* +, *Rumex crispus* +, *Taraxacum* sect. *Ruderalia* +, *Veronica arvensis* +, *Carduus crispus* r, number of species 23, relevé area 50 m², total cover 95%, cover crop layer (winter-sown rye) 60%, cover herb layer 30%, cover cryptogam layer 10%, pH (KCl) = 5.95, CaCO₃ 0.0%, C/N ratio = 8.8, Brandenburg near Strasburg, MTB 2548, RW 5413. 180 km, HW 1919. 180 km. 19.08. 1998 – relevé taken from MANTHEY (2003: tab. A.11, rel. 465) [neotypus MANTHEY hoc loco]. – The *nomen mutatum* is proposed because the name *Alchemilla arvensis* has not been used for the name-giving species for a long time.
- Papaveretum argemones (LIBBERT 1932*) KRUSEMAN & VIEGER 1939*: 343 nom. cons. propos. (≡ Sclerantho annui-Myosuretum minimi LIBBERT 1932*): KRUSEMAN & VIEGER (1939: tab. 4, rel. 2) [lectotypus MANTHEY hoc loco] – The suggestion of MUCINA (1993b: 127), that the Sclerantho annui-Myosuretum minimi was invalidly published by LIBBERT (1932: 17), is not correct. LIBBERT (l.c.) simply published relevés without abundance values, but the 12 complete species lists given in his paper are equivalent to a synoptic table, which is sufficient for a valid description of an association before 1979 (ICPN Art. 7 Sect. 2). The Sclerantho

annui-Myosuretum minimi is actually the valid name of the type association, but we propose to conserve the recently and frequently used *nomen novum* from KRUSEMAN & VIEGER (1939) in its place.

4.4 Calluno-Ulicetea BR.-BL. & TX. ex KLIKA & HADAČ 1944⁵

4.4.1 Typifications

- Querco-Ulicetea LEBRUN et al. 1949*: 174:
 Calluno-Ulicetalia [‘(QUANTIN) TÜXEN’] LEBRUN et al. 1949*: 174 [lectotypus BERG, DENGLER & SPANGENBERG hoc loco]
- Calluno-Genistetalia SCHWICKERATH 1944*: 233:
 Ulicion MALCUIT 1929*: 125 [lectotypus BERG & DENGLER hoc loco]
- Vaccinio-Genistetalia SCHUBERT ex PASSARGE 1964*: 278:
 Calluno-Genistion [‘DUVIGNEAUD 1944’] PASSARGE 1964*: 278 (= Genistion BÖCHER 1943*) [lectotypus BERG & DENGLER hoc loco]
- Genistion BÖCHER 1943*: 55:
 Calluno-Genistetum TX. 1937*: 117 [Art. 32a] (= Genisto pilosae-Callunetum vulgaris BR.-BL.] 1915 nom. invers. propos.) [lectotypus BERG & DENGLER hoc loco] – The addition of the species epithet ‘anglicae’ in the name Calluno-Genistetum TX. 1937*, as often can be found in the literature, is not authorised according to ICPN Art. 40 in combination with Recomm. 10C since it is not clear from which *Genista*-species the syntaxon name is formed. The synoptic list of TÜXEN (1937: 117) includes both *Genista pilosa* and *G. anglica*, with 59% and 50% constancy respectively.
- Ulicion QUENTIN 1935*: 163:
 Ulici nani-Callunetum vulgaris ALLORGE 1921 [lectotypus BERG & DENGLER hoc loco] – This association was first published 1921 in a series of papers in the journal „Revue Général de Botanique“. All these papers were published a sec-

⁵ The interpretation of the class name used here as a *nomen nudum* by MUCINA (1997: 138) is unfounded. KLIKA & HADAČ (1944b: 289) included in this class the validly published order Calluno-Ulicetalia (Quantin 1935*) TX. 1937*, and it is nomenclaturally irrelevant that this is an illegitimate name. An unambiguous bibliographic reference to the protologue of this order is also given, since the textbook of KLIKA & NOVÁK (1941, ‘Praktikum’) is cited under the class and in this work ‘TÜXEN 1937’ is included in the reference list. The precise bibliographic reference to KLIKA & NOVÁK (1941) is given in the first part of the publication series (KLIKA & HADAČ 1944a: 249).

ond time with identical text as a monograph (ALLORGE 1922) where the protologue of the Ulici nani-Callunetum vulgaris can be found on page 264.

Genista pilosae-Callunetum vulgaris BR.-BL. 1915* nom. invers. propos. (original form: 'Landes à *Calluna* et *Genista pilosa* (Calluneto-Genistetum)'):

BRAUN (1915: 129, rel. a) [lectotypus BERG & DENGLER hoc loco] – The inversion of the name is proposed following ICPN Art. 42, since *Calluna vulgaris* in the two relevés of the protologue has considerably higher abundance-cover values than *Genista pilosa*.

4.5 Koelerio-Coryneporetea KLIKA in KLIKA & V. NOVÁK 1941

4.5.1 General concept

As first explained in DENGLER (2001a) and in detail in DENGLER (2003: 201), communities of dry grasslands on sandy soils (Koelerio-Coryneporetea) and those of weathered rock and outcrops (Sedo-Scleranthenea) have many species in common which can only be listed as character species of a class when both units are combined into a single class. The most constant taxa under these syntaxonomic conditions are *Tortula ruralis* agg., *Ceratodon purpureus* subsp. *purpureus*, *Rumex acetosella*, *Polytrichum piliferum*, *Cetraria aculeata* and *Sedum acre* (cf. DENGLER 2003: 202). Each of the two community-groups has in itself an extensive pool of separate character species which is broadly absent in the other group (see below). From a European point-of-view, both groups contain several orders and so it is correct to give them the rank of subclasses (see sections 4.5.2 and 4.5.3).

4.5.2 Koelerio-Coryneporetea (KLIKA in KLIKA & NOVÁK 1941) DENGLER stat. nov. hoc loco

According to the current knowledge, the Koelerio-Coryneporetea (communities of dry grasslands on sandy soils) contain the following 6 orders: Coryneporetalia canescentis KLIKA 1934* (subatlantic, Silvergrass-rich pioneer communities), Artemisio-Koelerietalia albescentis SISSINGH 1974* (atlantic and subatlantic short-grass dunes), Thero-Airetalia RIVAS GODAY 1964* (atlantic and subatlantic, therophyte-rich silicolous dry grasslands),

Jasiono sesseliflorae-Koelerietalia crassipedis RIVAS-MARTÍNEZ & CANTÓ 1987* (silicolous dry grasslands of the North Iberian mountains, dominated by perennials), Trifolio arvensis-Festucetalia ovinae MORAVEC 1967* (mesophytic silicolous grasslands dominated by hemicryptophytes), Sedo acris-Festucetalia TX. 1951* nom. invers. propos. (subcontinental and continental sand-swards rich in *Koeleria glauca*). A map of the potential distribution area of the subclass is given in DENGLER (2003: 217).

Protologue: 'Koelerio-Coryneporetales' (KLIKA in KLIKA & NOVÁK 1941: 59)

Type: Coryneporetalia KLIKA 1934* [holotypus (Art. 27a) – as lectotype for the class, designated by MORAVEC (1967: 173)]

Incl.: Coryneporetea LEBRUN et al. 1949*
Caricetea arenariae DOING 1963* [Art. 8]

Helianthemetea guttati (RIVAS GODAY 1958) RIVAS GODAY & RIVAS-MARTÍNEZ 1963* sensu auct. p. min. p.
Festucetea vaginatae SOÓ ex VICHEREK 1972*

Helichryso-Crucianelletea GÉHU et al. ex SISSINGH 1974* p. p. [typo incl.]

C: *Agrostis delicatula*, *Aira praecox*, *Arenaria querosoides*, *Brachythecium albicans*, *Bromus thominii*, *Campylopus introflexus*, *Carex ligerica*, *C. praecox* subsp. *praecox*, *Cerastium semidecandrum*, *Cetraria muricata*, *Corynephorus canescens*, *Ephedra distachya* subsp. *distachya*, *Erodium ballii*, *Jasione montana*, *Helichrysum arenarium*, *Herniaria scabrida*, *Hieracium castellanum*, *Myosotis ramosissima*, *Paronychia polygonifolia*, *Phleum arenarium*, *Silene conica*, *Spergula morisonii*, *Teesdalia nudicaulis*, *Trifolium campestre*, *Vulpia bromoides*

D: *Agrostis capillaris*, *Carex arenaria*, *Hypochaeris radicata*

4.5.3 Sedo-Scleranthenea (BR.-BL. 1955) DENGLER stat. nov. hoc loco

The subclass consists of weathered rock and outcrop communities. According to current knowledge, it contains the two orders Sedo-Scleranthetalia BR.-BL. 1955* (acidophytic communities) and Alysso alyssoidis-Sedetalia MORAVEC 1967* (basiphytic communities). A

map of the potential distribution area of the subclass is given in DENGLER (2003: 218).

Protologue: 'Sedo-Scleranthetea' (BRAUN-BLANQUET 1955: 484)

Type: Sedo-Scleranthetalia BR.-BL. 1955* [holotypus (Art. 27a)]

C: *Arenaria serpyllifolia* agg., *Cerastium pumilum* agg., *Cladonia foliacea*, *Erophila verna*, *Holosteum umbellatum*, *Jovibarba globifera*, *Peltigera rufescens*, *Pleurochaete squarrosa*, *Poa perconcinna*, *Potentilla argentea* agg., *Potentilla tabernaemontani*, *Sedum album*, *S. montanum*, *S. rupestre*, *Sempervivum arachnoideum*

D: *Cladonia pyxidata*

4.5.4 Typifications

Helichryso-Crucianelletea GÉHU et al. ex SISSINGH 1974*: 103:

Artemisio-Koelerietalia albescentis SISSINGH 1974*: 103 [lectotypus DENGLER hoc loco]

Artemisio-Koelerietalia albescentis SISSINGH 1974*: 103:

Euphorbio portlandicae-Helichryson stoechadis SISSINGH 1974*: 103 [lectotypus DENGLER hoc loco]

Corynephorretalia canescentis KLIKA 1934*: 14: 'Corynephorion' KLIKA 1934*: 15 (= Corynephorion canescentis KLIKA 1931a*) [lectotypus (Art. 20)]

Festucetalia vaginatae SOÓ 1957*: 51:

Festucion vaginatae SOÓ 1929*: 342 [lectotypus (Art. 20)]

Alyso alyssoidis-Sedion OBERD. & T.MÜLLER in T.MÜLLER 1961*: 116:

Alyso alyssoidis-Sedetum albi OBERD. & T.MÜLLER in T.MÜLLER 1961*: 116 [lectotypus (Art. 20)]

Corynephorion canescentis KLIKA 1931a*: 295:

Corynephorretum [= Weingaertnerietum] typicum TX. 1928*: tab. (= Corniculario aculeatae-Corynephorretum canescentis STEFFEN 1931* nom. invers. propos.) [lectotypus (Art. 20)]

Corynephorion KLIKA 1934*: 154:

'Corynephorretum typicum' TX. 1928*: tab. (= Corniculario aculeatae-Corynephorretum canescentis STEFFEN 1931* nom. invers. propos.) [lectotypus (Art. 20)]

Koelerio-Phleion phleoidis KORNECK 1974*: 115: Genistello-Phleietum phleoidis KORNECK 1974*: 115 [lectotypus DENGLER hoc loco]

Sileno conicae-Cerastion semidecandri KORNECK 1974*: 45:

Sileno conicae-Cerastietum semidecandri KORNECK 1974*: 47 [lectotypus (Art. 20)]

Agrostietum vinealis KOBENDZA 1930* corr. KRATZERT & DENGLER 1999*:

KOBENDZA (1930: tab. 8, rel. 6) [lectotypus DENGLER hoc loco]

Airetum praecocis KRAUSCH 1967*:

KRAUSCH (1967: tab. 8, rel. 2) [lectotypus DENGLER hoc loco] – This name thus becomes a later syntaxonomic synonym of the Carici arenariae-Airetum praecocis WESTHOFF et al. 1962* nom. invers. propos.

Airo-Festucetum SOMMER 1971*:

SOMMER (1971: tab. 10, rel. 2) [lectotypus DENGLER hoc loco]

Airo-Festucetum ovinae TX. ex KORNECK 1974* nom. illeg. [Art. 32a]:

KORNECK (1974: 44, 'Moseltal 14.10.1962') [lectotypus DENGLER hoc loco] – This name thus becomes a later syntaxonomic synonym of the Airo-Festucetum SOMMER 1971*.

Allio schoenoprasii-Caricetum praecocis TX. ex WALTHER 1977*:

WALTHER (1977: tab. 33, rel. 7) [lectotypus DENGLER hoc loco]

Armerio-Festucetum HOHENESTER 1960*: 46 (= Armerio-Festucetum typicum HOHENESTER 1960*):

Armeria maritima subsp. *elongata* 3, *Cladonia furcata* 3, *Hieracium pilosella* 3, *Agrostis capillaris* 2, *Festuca brevipila* 2, *Festuca ovina* 2, *Racomitrium canescens* agg. 2, *Achillea millefolium* agg. 1, *Artemisia campestris* 1, *Hypochaeris radicata* 1, *Lotus corniculatus* 1, *Luzula campestris* 1, *Anthoxanthum odoratum* +, *Cerastium arvense* +, *Cerastium semidecandrum* +, *Dianthus deltoides* +, *Hypnum jutlandicum* +, *Medicago lupulina* +, *Leontodon hispidus* +, *Plantago lanceolata* +, *Rumex acetosella* +, *Trifolium arvense* +, *Trifolium repens* +; number of species 24, relevé area 10 m², flat, Bavaria: near Regensburg – relevé taken from ZIELONKOWSKY (1973: tab. 15, rel. 39) [neotypus DENGLER hoc loco] – It is not correct to include 'R. KNAPP' in the author-citation of this association, as is sometimes done in the literature. The Armerio-Festucetum R. KNAPP is ineffectively (KNAPP 1942, 1944: ICPN Art. 1) or invalidly published (KNAPP 1948: ICPN Art. 7). HOHENESTER (1960), in the first valid description of the association, does not refer to R. KNAPP. His original diagnosis contains four synoptic lists of four subassociations. According to the recent classification, these units roughly correspond to four different associations (Diantho deltoidis-Armerietum elongatae KRAUSCH ex PÖTSCH 1962* nom. cons. propos., Sileno otitae-Festucetum brevipilae LIBBERT 1933* corr. KRATZERT & DENGLER 1999* nom. invers. pro-

- pos., Koelerio glaucae-Jurineetum cyanoidis VOLK 1931* and one Festuco-Brometea-community). The synoptic table of the Armerio-Festucetum typicum admittedly corresponds mostly to the Diantho deltoidis-Armerietum elongatae, but the table should also include relevés belonging to other associations. As a result, the name of the association has been used differently in the literature since its first publication and the name should therefore be rejected as a *nomen ambiguum*. For this reason, the necessary neotypification is given here. In accordance with ICPN Recomm. 21A, the neotype is taken from the same geographical area as the original diagnosis (Northern Bavaria). The name thus becomes a syntaxonomic synonym of the Diantho deltoidis-Armerietum elongatae KRAUSCH ex PÖTSCH 1962* nom. cons. propos.
- Brometum tectorum BOJKO 1934*:**
BOJKO (1934: S. 632, rel. 8) [lectotypus DENGLER hoc loco] – The name thus becomes a syntaxonomic synonym of the Equisetetum ramosissimi BOJKO 1934*.
- Caricetum arenariae REGEL 1928* [Art. 31]:**
REGEL (1928: tab. 4, rel. 8) [lectotypus DENGLER hoc loco]
- Carici arenariae-Airetum praecocis WESTHOFF et al. 1962* nom. invers. propos. (original form: Airo-Caricetum arenariae):**
WESTHOFF et al. (1962: tab. 12, rel. 4) [lectotypus DENGLER hoc loco] – The inversion of the name is proposed according to ICPN Art. 42, because *Aira praecox* in 13 of the 18 relevés of the original diagnosis has a higher cover-abundance value than *Carex arenaria*, including in the designated type relevé.
- Carici-Armerietum elongatae WALTHER 1977*:**
WALTHER (1977: tab. 34, rel. 8) [lectotypus DENGLER hoc loco] – The name thus becomes a later syntaxonomic synonym of the Diantho deltoidis-Armerietum elongatae KRAUSCH ex PÖTSCH 1962* nom. cons. propos.
- Corniculario aculeatae-Corynephorum canescens STEFFEN 1931* nom. invers. propos. (original form: 'Corynephorus-Cornicularia-Assoziation'):**
STEFFEN (1931: tab. 44, rel. 6) [lectotypus DENGLER hoc loco] – The different lectotypification by PASSARGE (2002: 5), as a result of which the name would become a syntaxonomic synonym of the Helichryso arenarii-Jasionetum litoralis LIBBERT 1940*, is not effective according to ICPN Art. 5 Sect. 3. In accordance with ICPN Art. 42, the inversion of the name is proposed because the grass *Corynephorus canescens* belongs to a higher stratum than the lichen *Cetraria aculeata*.
- Galio veri-Festucetum capillatae BR.-BL. & DE LEEUW 1936* nom. invers. et mut. propos. (original form: 'Festuca capillata-Galium maritimum-Assoziation'):**
BRAUN-BLANQUET & DE LEEUW (1936: tab. 3, rel. A) [lectotypus DENGLER hoc loco] – In accordance with ICPN Art. 42, the inversion of the name is proposed because *Festuca* forms the matrix of the community and *Galium* is absent from many stands of the association (cf. synoptic table in DENGLER 2001c). Of the two relevés given in the original diagnosis, the relevé selected here as type is also dominated by *Festuca*, whereas in the other one both species are present with the same cover-abundance value. Furthermore, the unauthorised change of the epithet from '*maritimum*' to '*verum*' without any decision from the CNC by WEEDA et al. (1996) will be the subject of a forthcoming application. The first epithet is based on *Galium verum* var. *maritimum*, a taxon that has not been used in most of the floras for many years. Moreover, the name of the association in its present form – as also pointed out by WEEDA et al. (l.c.) – raises the possibility of confusion with *Galium maritimum*, a Southwest European species (cf. EHRENDORFER & KRENDL in TUTIN et al. 1976: 22).
- Festucetum polesicae REGEL 1928*:**
REGEL (1928: tab. 4, rel. 4) [lectotypus DENGLER hoc loco]
- Helichryso arenarii-Jasionetum litoralis LIBBERT 1940*:**
LIBBERT (1940: tab. 6, rel. 3) [lectotypus DENGLER hoc loco]
- Ornithopodo-Corynephorum PASSARGE 1960*:**
PASSARGE (1960: tab. 2, rel. 4a) [lectotypus DENGLER hoc loco] – This name thus becomes a later syntaxonomic synonym of the Helichryso arenarii-Jasionetum litoralis LIBBERT 1940*.
- Poo compressae-Saxifragetum tridactylitae GÉHU 1961*:**
GÉHU (1961: tab. 25, rel. 2) [lectotypus DENGLER hoc loco]
- Spergulo-Corynephorum (TX. 1928*) PASSARGE 1960* (basonym: Weingaertnerietum TX. 1928*, non BR.-BL.] 1915* nom. illeg. [Art. 32 a, 32b]:**
TÜXEN (1928: rel. 4) [lectotypus DENGLER hoc loco] – This name thus becomes a later syntaxonomic synonym of the Corniculario aculeatae-Corynephorum canescens STEFFEN 1931* nom. invers. propos.
- Sileno conicae-Cerastietum semidecandri KORNECK 1974*:**
KORNECK (1974: tab. 33, rel. 1) [lectotypus DENGLER hoc loco]

Sileno otitae-Koelerietum gracilis KORNECK 1974*: KORNECK (1974: tab. 93, rel. 4) [lectotypus DENGLER hoc loco] – This name thus becomes a later syntaxonomic synonym of the *Sileno otitae-Festucetum brevipilae* LIBBERT 1933* corr. KRATZERT & DENGLER 1999* nom. invers. propos.

Thymo pulegioidis-Festucetum ovinae OBERD. 1957*:

GÖRS (1968: tab. 26, rel. 8) [neotypus DENGLER hoc loco] – The reference to 'BARTSCH 40' (which means: BARTSCH & BARTSCH 1940) by OBERDORFER (1957: 250) is irrelevant to the nomenclature. The relevés listed there belong to the same association, but BARTSCH & BARTSCH (1940: 42) expressly assign them to the *Festuco ovinae-Thymetum angustifolii* Tx. 1937*. The synoptic table of OBERDORFER (l.c.) thus represents the valid publication of a new association. However, the author also states in brackets that his data on *Festuca ovina* partly also include *F. capillata* (= *F. filiformis*). According to LANGE (1998: 396), *F. filiformis* is considerably rarer than *F. ovina* in the original areas of the relevés (central and southern part of the upper Rhine valley and deeper locations of the Black Forest), and so the addition of the species-epithet appears to be justified, especially as the author refers to BARTSCH & BARTSCH (1940) whose relevés contain only *F. ovina*. In her identical addition of the epithet, GÖRS (1968) also mentions OBERDORFER as co-originator. The publication of BARTSCH & BARTSCH (1940) contains single relevés, but the accompanying species with lowest presence are only listed and are not placed in the relevés. It thus seems more sensible to designate the neotype from the relevés of GÖRS (1968), and also because in that work the identity of the *Festuca*- and *Thymus*-taxa, that are essential for building the name of the syntaxon, is beyond doubt. The study area of GÖRS (1968), the 'Schwenninger Moos', is on the edge of the Black Forest and so this typification is sufficient for ICPN Recomm. 21A.

Tortulo ruraliformis-Galietum maritimi HOCQUETTE 1927*:

HOCQUETTE (1927: tab. 5, rel. 10) [lectotypus DENGLER hoc loco]

Vulpium myuri PHILIPPI 1973*:

PHILIPPI (1973: tab. 5, rel. 1) [lectotypus DENGLER hoc loco]

4.6 *Festuco-Brometea* BR.-BL. & TX. ex KLIKA & HADAČ 1944

4.6.1 General concept

The traditional syntaxonomic concept of the class is based on geographical-chorological

criteria. In general the syntaxon is divided into two orders: the subatlantic *Brometalia erecti* W.KOCH 1926*, non BR.-BL. 1936* and the subcontinental-continentally distributed *Festucetalia valesiacae* BR.-BL. & TX. ex BR.-BL. 1950* (e.g. OBERDORFER & KORNECK 1978; POTT 1995; SCHUBERT et al. 2001; RENNWALD 2002). In his synthesising editing of the class throughout its entire range, ROYER (1991) accepts even more geographically characterised orders. This schematic procedure in the classification causes various problems: on the one hand it attempts to differentiate several mesophytic basiphilous grasslands at the order-level because of minor differences in floristic composition. On the other hand it prevents a reasonable syntaxonomic classification of species-poor basiphilous grassland types from the northern margin of their geographical distribution range (see section 4.6.2). For this reason, a different concept is preferred here, which is substantiated in detail and supported by synthetic tables from large parts of Europe in DENGLER (in prep.). As preferred by KRAUSCH (1961), KORNECK (1974), MUCINA & KOLBEK (1993b) and DENGLER (1994: 252, 2003: 199), all mesophytic syntaxa of the class are combined into one order of mesophytic basiphilous grasslands (*Brachypodietalia pinnati* KORNECK 1974* = *Brometalia erecti* W.KOCH 1926*, non BR.-BL. 1936* p. p. nom. amb. propos. [typo incl.]). This order is very well characterised by a number of character species. Among others, the alliances *Meso-Bromion erecti* OBERD. 1949* (= *Bromion erecti* W.KOCH 1926*) and *Cirsio-Brachypodion pinnati* HADAČ & KLIKA in KLIKA & HADAČ 1944b* belong to this order. Because of the stronger isolation of the stands, the floristic differentiation of the xerophytic syntaxa is more obvious, and so at least three orders can be recognised west of the former Soviet Union: *Xero-Brometalia erecti* DENGLER 1994* nom. inval. [Art. 8, 12 Abs. 2] (subatlantic xerophytic grasslands), *Festucetalia valesiacae* BR.-BL. & TX. ex BR.-BL. 1950* (continental xerophytic grasslands and East European steppes), *Stipo pulcherrimae-Festucetalia pallentis* POP 1968* (praealpine-circumpannonian xerophytic grasslands on rock outcrops rich in *Festuca pallens*).

4.6.2 *Filipendulo vulgaris*-*Helictotrichion*
pratensis DENGLER & LÖBEL
all. nov. hoc loco

Mesophytic basiphilous grasslands in Northern Central Europe, Britain and Scandinavia undoubtedly belong to the class Festuco-Brometea. Although occurring at the northern margin of its geographical distribution range, they still contain several of its character species. However, in recent decades the detailed classification of these communities has given rise to some controversy (e.g. BRAUN-BLANQUET 1963; WILLEMS 1982; WESTHOFF et al. 1983; KARHULEC et al. 1986; ROYER 1991; DIERSSEN 1996; see summary in LÖBEL 2002: 95 ff.). Classification problems are caused by the fact that species characterising the two 'classical', mainly geographically-defined orders Brometalia erecti W.KOCH 1926* and Festucetalia valesiacae BR.-BL. & TX. ex BR.-BL. 1950* and their alliances are largely absent. By establishing an order of mesophytic basiphilous grasslands (*Brachypodietalia pinnati* KORNECK 1974*, see 4.6.3), most classification problems can be solved. Many character species (e.g. *Pimpinella saxifraga* agg., *Leontodon hispidus* subsp. *hispidus*, *Cirsium acaule*, *Carex caryophyllea*) and differential species (e.g. *Galium verum*, *Linum catharticum*, *Briza media*) of such an order are common in the North and North Central European communities. As DENGLER (2003: 200) has shown in a synoptic table, it is possible to separate three syntaxonomic units within this order: A south-western unit including the alliance Bromion erecti W.KOCH 1926*, a south-eastern unit represented by the alliances *Cirsio-Brachypodion pinnati* HADAČ & KLIKA in KLIKA & HADAČ 1944b* and *Agrostio vinealis-Avenulion schellianae* ROYER 1991*, and a northern one. Whereas the first two units are well defined by their own character species, the northern one contains only a few character species of its own. But there are several differential species, mainly mesophilous or slightly acidophilous graminoids and mosses (e.g. *Luzula campestris*, *Festuca rubra* agg., *Dicranum scoparium*). Applying the central taxon concept (compare DENGLER & BERG 2001; DENGLER 2003: 103 ff.), it is possible to distinguish these communities as a distinct northern

syntaxonomic unit. Its potential synareal is shown in DENGLER (2003: 223, fig. 29). Other authors, especially WILLEMS (1982) and DIERSSEN (1996: 639), have previously pointed out the distinctness of these North-European communities.

As these three syntaxonomic units partly comprise more than one alliance, they will be described as suborders (DENGLER in prep.). Some weak character species and several geographical differential species even allow a subdivision to be made of the central suborder ('Homalothecio lutescentis-*Helictotrichenalia pratensis*') into two alliances, one with a western distribution, occurring in Northern France and the British Isles (= British Isles subgroup of the Meso-Bromion sensu WILLEMS 1982*), and one with more easterly in distribution. The latter is described here (*Filipendulo-Helictotrichion*). Its distribution range comprises the lowlands of Northern Germany, Denmark, Southern Sweden and probably also the lowlands of Poland and the Baltic. Within the suborder the differential taxa mentioned below separate the eastern alliance from the western one. According to our understanding, the *Filipendulo-Helictotrichion* includes the *Solidagini-Helictotrichetum pratensis* WILLEMS et al. 1981* representing the central association (especially Denmark, Schleswig-Holstein, Mecklenburg-Vorpommern), the *Fragario viridis-Helictotrichetum pratensis* HALLBERG 1971* (Southern Swedish mainland), the *Veronico spicatae-Avenetum* KRAHULEC et al. 1986* nom. inval. (Alvar on Öland). Additional associations may occur on Öland (see LÖBEL 2002), Gotland and in the Baltic countries.

- Type: *Fragario viridis-Helictotrichetum pratensis* HALLBERG 1971*: 73 [holotypus]
Syn.: Bromion erecti W.KOCH 1926* sensu auct. p. min. p. [typo excl.]
Bromion erecti BR.-BL. 1936* p. p. [Art. 8, 31]
Meso-Bromion OBERD. 1949* sensu auct. p. min. p. [typo excl.]
Helianthemo-Globularion BR.-BL. 1963* p. p. [Art. 38]
Gentiano amarellae-Avenulion pratensis ROYER 1991* p. p. [Art. 3b]
Gentiano amarellae-Avenulion pratensis ROYER ['(WILLEMS 1982) ROYER 1987'] ex JULVE 1993* p. p. [Art. 5]

- Incl.: Avenulo-Seslerienion uliginosae ['uluginosae'] ROYER 1991*
S. Scand. subgroup [Meso-Bromion] sensu WILLEMS 1982*
- C: *Alchemilla glaucescens*, *Helictotrichon pratense*
- D: *Arabis hirsuta* agg., *Artemisia campestris* subsp. *campestris*, *Asperula tinctoria*, *Carex ericetorum*, *Centaurea jacea*, *C. scabiosa* subsp. *scabiosa*, *Filipendula vulgaris*, *Fragaria viridis*, *Galium boreale*, *Plagiomnium affine*, *Plantago media*, *Poa angustifolia*, *Primula veris* subsp. *veris*, *Pseudolysimachion spicatum* subsp. *spicatum*, *Solidago virgaurea* subsp. *virgaurea*, *Thuidium abietinum*, *Thymus serpyllum*
- Note: The Helianthemo-Globularion BR.-BL. 1963* is not validly published because its holotype (Phleo phleoidis-Veronicetum spicatae BR.-BL. 1963*) is a *nomen dubium*. The latter is based on four relevés, mostly with a size of 50 m². KRAHULEC et al. (1986) and LÖBEL (2002) have published much higher numbers of species on relevé areas of 9 m² or 4 m² respectively. This illustrates the incompleteness of the relevés in BRAUN-BLANQUET (1963: 28). Moreover, according to his species lists, each of these relevés comprises a mosaic of Festuco-Brometea and Koelerio-Corynepherea communities, which is almost unavoidable if one uses such large relevé areas in the dry grasslands of the Great Alvar of Öland.

4.6.3 Typifications

- Brachypodietalia pinnati KORNECK 1974*: 123: Cirsio-Brachypodion pinnati HADAČ & KLIKA in KLIKA & HADAČ 1944b* [lectotypus DENGLER hoc loco] – The order is here typified in a way that will exclude name confusion in the future even if a classification of the class is used that is different from the one proposed in DENGLER (in BERG et al. 2003, in prep.). With the Cirsio-Brachypodion as type, the name 'Brachypodietalia pinnati' can only be used as an order of mesophytic basiphilous grasslands but not in the traditional concept in which the class is divided into a western and an eastern order.
- Brometalia BR.-BL. 1936*: 169 nom. illeg. [Art. 32a]:
Festucion valesiacae KLIKA 1931b*: 376 [lectotypus DENGLER hoc loco] – BRAUN-BLANQUET (1936) has classified the two alliances Festucion valesiacae und Bromion erecti in this order. In his paper, he only published a bibliographic reference to the original diagnosis of the Festucion valesiacae KLIKA 1931b*, and did not validate

the Bromion erecti by subordinating a validly described association or through a bibliographic reference to such an association. Only the Festucion valesiacae can thus be used as lectotype. Long before this, KOCH (1926: 20) had validly published an order with the same name (Brometalia erecti W.KOCH 1926*), with the holotype Bromion erecti W.KOCH 1926* as the only alliance. The holotype of the alliance is the Meso-Brometalia erecti W.KOCH 1926* because it is the only association explicitly classified within the Bromion and documented by relevés. In the decades that followed, the name Brometalia erecti (mostly with the author reference 'BR.-BL. 1936') was used by the majority of phytosociologists in the sense of the two alliances Meso-Bromion erecti OBERD. 1949* (= Bromion erecti W.KOCH 1926*) and Xero-Bromion erecti (BR.-BL. & MOOR 1938) MORAVEC in HOLUB et al. 1967* (e.g. OBERDORFER & KORNECK 1978; POTT 1995; SCHUBERT et al. 2001), but in the light of the arguments given above this was not actually correct. After the transfer of the Meso-Bromion into his mesophytic order Brachypodietalia pinnati, KORNECK (1974) used the name 'Brometalia erecti BR.-BL. 1936' for the rest of the order, which then contained only the Xero-Bromion. This accords neither with the type location in KOCH (1926) nor with BRAUN-BLANQUET (1936). We therefore propose to reject the name 'Brometalia erecti' with both author citations as a *nomen ambiguum*.

- Aveno pratensis-Viscarietum vulgaris OBERD. 1949*:
OBERDORFER (1949: tab. 6, rel. 2) [neotypus DENGLER hoc loco] – This name thus becomes a syntaxonomic synonym of the Gentiano-Koelerietum R.KNAPP ex BORNKAMM 1960* nom. cons. propos. Due to its variable use in the literature, which often excludes its type, we propose to reject the name Aveno-Viscarietum as a *nomen ambiguum*.
- Cirsio-Trifolietum montani WOLLERT 1964*:
WOLLERT (1964, tab. 8, rel. 19 = serial no. 16) [lectotypus DENGLER & WOLLERT hoc loco] – DENGLER (in RENNWALD 2002: 201, 334) suggested using this association name for the floristically impoverished semi-dry grasslands in Northern Germany. Revision of the relevés included in the original diagnosis by WOLLERT (1964) has shown that they do indeed belong partly to the central association of the alliance Filipendulo vulgaris-Helictotrichion pratensis (see 4.6.2), but partly also to the Adonido vernalis-Brachypodietum pinnati (LIBBERT 1933*) KRAUSCH 1961* (Cirsio-Brachypodion pinnati

HADAČ & KLIKA in KLIKA & HADAČ 1944b*). Because of this it would be misleading to apply the name of WOLLERT (1964) to the association belonging to the northern alliance. We therefore designate here a lectotype which makes the name a later taxonomic synonym of the Adonido-Brachypodietum.

Filipendulo-Helictotrichetum pratensis MAHN 1965*:

MAHN (1965: tab. 37, rel. 1) [lectotypus DENGELER hoc loc] – This name thus becomes a later taxonomic synonym of the Scorzonero hispanicae-Brachypodietum pinnati GAUCKLER 1957* nom. invers. propos.

4.7 Molinio-Arrhenatheretea TX. 1937

4.7.1 General concept

According to JANSEN & PÄZOLT (in BERG et al. 2003), the class can be divided into three superior syntaxa of equal rank in Central Europe: the Arrhenatheretea elatioris TX. 1931*, the Deschampsietalia cespitosae HORVATÍC 1958* (= Potentillo-Polygonetalia avicularis TX. 1947* nom. amb. propos.) and the Molinietaalia caeruleae W.KOCH 1926*. However, a statistical comparison with all other syntaxa from open landscapes (BERG et al. 2001b) showed that the first two orders are (extensively) lacking character species since nearly all the taxa mentioned as such in the literature do not fulfil the character species criterion. These two orders can therefore only be retained with our method when they are judged to be the central syntaxa of two subclasses. The floristic and ecological break between the Arrhenatheretalia growing on sites far from the water table on the one hand and the Deschampsietalia and the Molinietaalia of hydromorphic sites on the other hand supports this classification. DE FOUCAULT (1989) had earlier proposed the subdivision of the class into two subclasses, but they were invalidly published by him. The subclass Arrhenatheretea elatioris DE FOUCAULT 1989* largely resembles our concept, though he includes two further orders not occurring in Central Europe. This subclass is opposed to the Agrostienea DE FOUCAULT 1989* in which he unites temporarily flooded meadows. The 'real' wet meadows (order Molinietaalia) are excluded by him from the emended class. As a consequence of all this, new names for both subclasses have to be published here.

4.7.2 Arrhenatheretea (BR.-BL. 1950*)

F.JANSEN & PÄZOLT stat. nov. hoc loco

In Central Europe the subclass contains only the order Arrhenatheretalia elatioris TX. 1931*. A Europe-wide table comparison should establish whether the two other orders from DE FOUCAULT (1989) also belong here.

Protologue: 'Arrhenatheretea BR.-BL. 1947' (BRAUN-BLANQUET 1949: 293) – reference list in BRAUN-BLANQUET (1950: 357)

Type: Arrhenatheretalia elatioris ['PAWŁOWSKI 1928'] BR.-BL. 1949*: 293 ex 1950*: 357 (= Arrhenatheretalia TX. 1931*) [holotypus]

Syn.: Arrhenatheretea DE FOUCAULT 1989* [Art. 5]

Incl.: Arrhenatheretea BR.-BL. 1947* [Art. 8]
C: *Bellis perennis*, *Cardaminopsis arenosa* subsp. *arenosa*, *Trifolium dubium*

D: *Agrostis capillaris*, *Bromus hordeaceus*, *Dactylis glomerata*, *Hypochaeris radicata*, *Lolium perenne*, *Medicago lupulina*, *Rumex acetosella*, *Veronica chamaedrys*

Note: See the comments in section 2.5.5.

4.7.3 Molinio-Juncenea (BR.-BL. 1950*)

PÄZOLT & F.JANSEN stat. nov. hoc loco

As a basionym for the subclass, the older class name from BRAUN-BLANQUET (1949) seems to be more fitting than Agrostienea stoloniferae T.MÜLLER & GÖRS in GÖRS 1968*. The Molinio-Juncenea contain in Central Europe the orders Deschampsietalia cespitosae HORVATÍC 1958* (= Potentillo-Polygonetalia avicularis TX. 1947* nom. amb. propos. p. p. [typo incl.]; alternating-wet valley meadows) and Molinietaalia caeruleae W.KOCH 1926* (wet meadows with Purple Moor-grass and/or Marsh-mari-gold).

Protologue: BRAUN-BLANQUET (1949: 295) – reference list in BRAUN-BLANQUET (1950: 357)

Type: Molinietaalia caeruleae W.KOCH 1926*: 20 [holotypus]

Syn.: Agrostienea stoloniferae DE FOUCAULT 1989* [Art. 5, 8]

Incl.: Caricetea uliginosae BR.-BL. & VLIÉGER in VLIÉGER 1937* p. p. [Art. 34a]
Molinio-Juncenea BR.-BL. 1947* [Art. 8]

- Sphagno-Caricetea fuscae (BR.-BL. & VLIEGER in VLIEGER 1937*) DUVIGNEAUD 1949* p. p. [typo incl.; Art. 29c] Agrostietaea stoloniferae T.MÜLLER & GÖRS in GÖRS 1968*
- C: *Achillea ptarmica*, *Angelica sylvestris*, *Bistorta officinalis*, *Cirsium oleraceum*, *Deschampsia cespitosa*, *Lathyrus pratensis*, *Lysimachia nummularia*, *Polemonium caeruleum*, *Ranunculus acris*, *Rhinanthus minor*, *Senecio aquaticus* agg., *Silene flos-cuculi*
- D: *Calliargonella cuspidata*, *Caltha palustris*, *Carex acuta*, *C. disticha*, *C. nigra*, *C. panicea*, *Cirsium palustre*, *Equisetum palustre*, *Hydrocotyle vulgaris*, *Lysimachia vulgaris*, *Lythrum salicaria*, *Mentha aquatica*, *Molinia caerulea* agg., *Myosotis scorpioides* subsp. *scorpioides*, *Poa palustris*, *Selinum carvifolia*, *Succisa pratensis*
- Anthrisco-Heracleion PASSARGE 1975*: 615:
Campanulo-Lathyretum pratensis PASSARGE 1975*: 606 [lectotypus F. JANSEN & DENGLER hoc loco]
- Calthion palustris TX. 1937*: 89:
Cirsio oleracei-Angelicetum sylvestris TX. 1937*: 89 [lectotypus PÄZOLT hoc loco]
- Deschampsion cespitosae HORVATÍČ 1930*:
Deschampsietum cespitosae HAYEK ex HORVATÍČ 1930*, non RÜBEL 1911 (≡ Succisello inflexae-Deschampsietum cespitosae [HAYEK ex HORVATÍČ 1930*] ELLMAUER in ELLMAUER & MUCINA 1993*) [lectotypus (Art. 20)]
- Hyperico-Vicion angustifoliae PASSARGE 1975*: 615:
Vicio-Galietum molluginis 1975*: 608 [lectotypus F. JANSEN & DENGLER hoc loco]
- Lolion perennis FElföldy 1942*: 96:
Lolietum perennis FElföldy 1942*: 104 [lectotypus (Art. 20)] – The alliance name Lolion perennis FElföldy 1942* is validly published, despite the opinion of ELLMAUER & MUCINA (1993: 361). FElföldy (1942) includes four associations within the alliance, which are all newly described with tables. Neither the fact that the Lolietum perennis FElföldy 1942* may possibly, as a later homonym, be illegitimate, nor the orthographical error ‘*Lolion perenne-ass.*’ (l.c.: 96; correct on page 104!), impair the validity. However, three associations of the protologue are now usually placed in other orders or even classes. The alliance name from FElföldy should therefore be rejected as a *no-men ambiguum*.
- Molinio-Juncion acutiflori DUVIGNEAUD 1949*: 102:
Molinetum caeruleae ALLORGE 1921* [lectotypus PÄZOLT hoc loco] – This association was first published 1921 in a series of papers in the journal „Revue Général de Botanique“. All these papers were published a second time with identical text as a monograph (ALLORGE 1922) where the protologue of the Molinetum caeruleae can be found on page 132.
- Potentillion anserinae TX. 1947*: 218 (≡ Lolio-Potentillion anserinae TX. 1947*: 276 nom. illeg. [Art. 29c]):
Ranunculo repentis-Alopecuretum geniculati TX. 1937*: 97 [lectotypus F. JANSEN, PÄZOLT & DENGLER hoc loco]
- Alopecuretum pratensis REGEL 1925*:
REGEL (1925: tab. 1, rel. 1) [lectotypus F. JANSEN hoc loco] – This name thus becomes a later syntaxonomic synonym of the Arrhenatheretum elatioris BR.[-BL.] 1915*.
- Campanulo-Lathyretum pratensis PASSARGE 1975*:
PASSARGE (1975: tab. 3, rel. 2) [neotypus F. JANSEN & DENGLER hoc loco]

- SEN & DENGLER hoc loco] – This name thus becomes a later syntaxonomic synonym of the Arrhenatheretum elatioris BR.[-BL.] 1915*.
- Chrysanthemo-Rumicetum thyrsoflori WALTHER 1977*: 87:
REDECKER (2001: tab. 4.10, rel. 2) [neotypus F. JANSEN & DENGLER hoc loco] – This name thus becomes a later syntaxonomic synonym of the Arrhenatheretum elatioris BR.[-BL.] 1915*.
- Deschampsio cespitosae-Heraclietum sibirici LIBBERT 1932*:
LIBBERT (1932: tab. 15, rel. 7) [lectotypus PÄZOLT hoc loco]
- Festuco-Crepidetum capillaris HÜLBUSCH & KIENAST in KIENAST 1978*:
KIENAST (1978: tab. 38, rel. 449 = serial no. 27) [lectotypus F. JANSEN hoc loco]
- Lolietum perennis FELFÖLDY 1942*:
FELFÖLDY (1942: tab. 4, rel. 1) [lectotypus F. JANSEN hoc loco] – The Lolietum perennis FELFÖLDY 1942* is not only validly published, but it also has a legitimate name because the older homonym from GAMS (1927: 313) is not valid according to ICPN Art. 7. This is because there is no specification of quantity for most of the species in the two published relevés. Through typification, the above name becomes a later syntaxonomic synonym of the Lolio perennis-Plantaginetum majoris BEGER 1932*.
- Lolio perennis-Cynosuretum cristati TX. 1937*: 101:
Alopecurus pratensis 3, *Lolium perenne* 3, *Trifolium repens* 3, *Potentilla anserina* 2, *Ranunculus repens* 2, *Cynosurus cristatus* 1, *Festuca pratensis* 1, *Plantago lanceolata* 1, *Poa pratensis* 1, *Ranunculus acris* 1, *Taraxacum* sect. *Ruderalia* 1, *Bellis perennis* +, *Cardamine pratensis* agg. +, *Holcus lanatus* +; number of species 14, relevé area 5 m², cover herb layer 100%, cover cryptogam layer 0%, cattle pasture, Lower Saxony: Aller river valley, 1.5 km below Celle-Boye – relevé taken from JECKEL (1984: tab. 14, rel. 2) [neotypus F. JANSEN & DENGLER hoc loco] – This designation of a neotype is in accordance with ICPN Recomm. 21A since the type relevé is taken from the same geographical area as the relevés of the synoptic table in the protologue (Lower Saxony). TÜXEN (1937) is the exclusive author of this association. It is not a validation of the name from BRAUN-BLANQUET & DE LEEUW (1936) because there is no description of an abstract vegetation unit but only of an informally named ‘*Lolium-Cynosurus-Weide*’ (= *Lolium-Cynosurus*-pasture). By ICPN Principle I in combination with Def. I, this is not to be taken as a syntaxon and so it can not be validated (see ICPN Recomm. 51A).
- Lolio perennis-Matricarietum suaveolentis TX. 1937*: 23:
Lolium perenne 2, *Poa annua* 2, *Taraxacum* sect. *Ruderalia* 2, *Trifolium repens* 2, *Arenaria serpyllifolia* 1, *Capsella bursa-pastoris* 1, *Convolvulus arvensis* 1, *Crepis capillaris* 1, *Leontodon autumnalis* +, *Matricaria discoidea* 1, *Medicago lupulina* 1, *Plantago major* 1, *Poa compressa* 1, *Poa trivialis* 1, *Coryza canadensis* +, *Daucus carota* +, *Equisetum arvense* +, *Lepidium ruderales* +, *Polygonum aviculare* agg. +, *Silene latifolia* subsp. *alba* +, *Sisymbrium officinale* +, *Sonchus oleraceus* +, *Tripleurospermum perforatum* +; number of species 23 – relevé taken from BEGER (1932: 512, rel. 3) [lectotypus F. JANSEN & DENGLER hoc loco] – The name thus becomes a later nomenclatural synonym of the Plantagini majoris-Lolietum perennis BEGER 1932* nom. invers. propos. (see below).
- Potentillo anserinae-Festucetum arundinaceae NORDHAGEN 1940*: 102 nom. invers. propos. (original form: Festuco arundinaceae-Potentilletum anserinae):
KRISCH (1974: tab. 8, rel. 7) [neotypus F. JANSEN hoc loco] – The inversion of the name is proposed according to ICPN Art. 42, because *Festuca arundinacea* belongs to a higher stratum than *Potentilla anserina* and is more frequent (e.g. 98% v. 77% in JANSEN & PÄZOLT 2001). The same holds true for the synoptic table of the Lolio perennis-Matricarietum festucetosum arundinaceae nom. prov. in TÜXEN (1937: 25) on which the original diagnosis of NORDHAGEN (1940) is based (100% vs. 90%). Moreover *Festuca arundinacea* in most cases has higher cover-abundance values compared with the other name-giving species as it is the case in the type relevé.
- Plantagini majoris-Lolietum perennis BEGER 1932* nom. invers. propos. (original form: Lolio perennis-Plantaginetum majoris):
BEGER (1932: 512, rel. 3) [lectotypus F. JANSEN & DENGLER hoc loco] – The inversion of the name is proposed according to ICPN Art. 42, because *Lolium perenne* dominates in three out of six relevés in the protologue over *Plantago major* whilst the two species have the same cover-abundance-value in the three others. The proposed change of the name does make even more sense when including not only perennial communities from trampled soils (as in the protologue) but also highly intensively used grasslands with a similar species composition as suggested by JANSEN & PÄZOLT (2001, in BERG et al. 2003).

Ranunculo repentis-Alopecuretum geniculati Tx. 1937*: 97 nom. cons. propos.: REDECKER (2001: tab. 4.3, rel. 31 = serial no. 7) [neotypus F. JANSEN hoc loco] – This designation of a neotype is in accordance with ICPN Recomm. 21A since the type relevé is taken from the same geographical area as the relevés of the synoptic table in the protologue (Lower Saxony). This widely used association name should be protected against the earlier Junco compressi-Trifolietum repentis ENGLER 1933*.

4.8 Trifolio-Geranietaea sanguinei T.MÜLLER 1962

4.8.1 General concept

Helio-thermophytic fringe and tall-herb communities growing on nitrate-poor sites are mostly classified in one of the following ways in the phytosociological literature: Some authors combine all these communities in one class, Trifolio-Geranietaea sanguinei T.MÜLLER 1962*, which they subdivide into an acidophytic order Melampyro pratensis-Holcetalia mollis PASSARGE 1979* and a basiphytic order Origanetalia vulgaris T.MÜLLER 1962* (e.g. MUCINA & KOLBEK 1993a; POTT 1995; RENNWALD 2002). Other authors separate the acidophytic units at the class level (Melampyro pratensis-Holcetea mollis PASSARGE ex KLAUCK 1992* nom. inval.), whereby both classes become monotypic (e.g. SCHAMINÉE et al. 1996; SCHUBERT et al. 2001; PASSARGE 2002). A ‘middle’ approach is followed here, as described in detail in DENGLER (2003: 190) and DENGLER (in BERG et al. 2003). On the one hand, numerous common species such as – with decreasing constancy – *Galium mollugo* agg., *Hypericum perforatum*, *Veronica chamaedrys*, *Plagiomnium affine*, *Scleropodium purum* and *Trifolium medium* could be considered as character species of a broadly delimited class Trifolio-Geranietaea. On the other hand, at least the basiphytic part of the class consists of two orders, each comprising several alliances (cf. sections 4.8.3 and 4.8.4) if viewed from a European perspective. In this light the proper solution seems to treat both the acidophytic and the basiphytic fringe communities as subclasses (cf. sections 4.8.2 and 4.8.3).

4.8.2 Melampyro pratensis-Holcetea mollis PASSARGE ex DENGLER subcl. nov. hoc loco

In the present state of knowledge, this acidophytic subclass only comprises the type suborder, at least when following our classificatory principles.

Type: Melampyro pratensis-Holcetalia mollis PASSARGE 1979*: 478 [holotypus]

Incl.: Melampyro-Holcetea mollis PASSARGE 1979* [Art. 3b]

Melampyro pratensis-Holcetea mollis PASSARGE ex KLAUCK 1992* [Art. 8]

Excl.: Pteridio aquilini-Rubetalia plicati DOING 1962 sensu JULVE 1993* p. max. p.

C: *Centaurea nigra* subsp. *nigra*, *Conopodium majus*, *Hieracium laevigatum*, *Hieracium sabaudum*, *Holcus mollis*, *Hypericum pulchrum*, *Lathyrus linifolius*, *Lonicera periclymenum*, *Melampyrum pratense*, *Pteridium aquilinum*, *Pulmonaria longifolia*, *Teucrium scorodonia*, *Viola riviniana*

D: *Agrostis capillaris*, *Anthoxanthum odoratum*, *Deschampsia flexuosa*, *Poa nemoralis*, *Scleropodium purum*, *Veronica officinalis*

Note: As the class Melampyro-Holcetea has not been validly published until now, an author citation with brackets according to ICPN Art. 51 is out of the question: PASSARGE (1979: 478) only erected the class provisionally. The validation by KLAUCK (1992) was also not successful, despite the opinion of MUCINA (1997: 141), since the only order Teucro scorodoniae-Melampyretalia pratensis KLAUCK 1992* is not validly published according to ICPN Art. 8. KLAUCK (1992) included the single alliance Melampyrion pratensis, but this was not published validly in the cited paper (PASSARGE 1967) according to ICPN Art. 3b, nor was it validated by KLAUCK himself (Art. 5 ICPN).

4.8.3 Trifolio-Geranietaea sanguinei (T.MÜLLER 1962) DENGLER stat. nov. hoc loco

This subclass comprises heliophytic fringe and tall-herb communities growing on neutral and basic sites. In the present state of knowledge, two orders can be distinguished: the Origanetalia vulgaris T.MÜLLER 1962* in the emended delimitation by DENGLER (in BERG et al. 2003) (mesophytic fringe communities) and the Antherico ramosi-Geranietaea sanguinei (see

section 4.8.4; xerophytic fringe communities from basic and subneutral sites).

Protologue: 'Trifolio-Geranietaea sanguinei' bzw. 'Trifolio-Geranietaea TH.MÜLLER 61' (MÜLLER 1962: 95, 98)

Type: *Origanetalia vulgaris* T.MÜLLER 1962*: 98 [holotypus (Art. 27)]

C: *Agrimonia eupatoria*, *Astragalus cicer*, *Astragalus glycyphyllos*, *Calamintha nepeta* agg., *Campanula persicifolia*, *Eurhynchium hians*, *Inula conyzae*, *Laserpitium siler*, *Lathyrus sylvestris*, *Lithospermum purpureocaeruleum*, *Melittis melissophyllum*, *Origanum vulgare*, *Tanacetum corymbosum*, *Trifolium rubens*, *Veronica teucrium*, *Vicia tenuifolia*, *Viola hirta*

D: *Brachypodium pinnatum* agg., *Euphorbia cyparissias*, *Galium verum*, *Lotus corniculatus*, *Poa angustifolia*

4.8.4 Antherico ramosi-Geranietalia sanguinei JULVE ex DENGLER ord. nov. hoc loco

JULVE (1993: 81) was the first to raise the status of the two alliances included by MÜLLER (1962) in the *Origanetalia vulgaris* to orders. He named his mesophytic order, which in terms of its content corresponds to the alliance *Trifolium medii* T.MÜLLER 1962*, as *Agrimonia eupatoria*-*Trifolietalia medii*, and his xerophytic order corresponding to the alliance *Geranion sanguinei* TX. in T.MÜLLER 1962* as *Antherico ramosi-Geranietalia sanguinei*. Neither unit was validly published as their author did not designate types (ICPN Art. 5) and did not retain the original name for one of his orders as is required by ICPN Art. 24a. Nevertheless, the concept of subdivisions proposed by JULVE (1993) could be confirmed by means of a synoptic table with relevés from large parts of Europe (DENGLER in prep.). JULVE's name for the xerophytic order is thus validated here. According to present knowledge, this comprises four alliances which are more or less vicariant: *Galio littoralis-Geranion sanguinei* GÉHU & GÉHU-FRANCK in DE FOUCAULT et al. 1983* (cold-temperate seacoasts and Southern Scandinavia), *Geranion sanguinei* TX. in T.MÜLLER 1962* (Central Europe), *Dictamniferulagion galbaniferae* (VAN GILS et al. 1975*) DE FOUCAULT et al. 1983* nom. inval. [Art. 5] (South-East Europe) und *Origanion*

virentis RIVAS-MARTÍNEZ & O. DE BOLÒS in RIVAS-MARTÍNEZ et al. 1984* (Iberian Peninsula). As a result of the typification in section 4.8.5, the mesophytic order must retain the name *Origanetalia vulgaris* T.MÜLLER 1962*. In addition to the *Trifolium medii* T.MÜLLER 1962*, the *Knaution dipsacifoliae* JULVE 1993* nom. inval. [Art. 5, 8] also belongs there.

Type: *Geranion sanguinei* TX. in T.MÜLLER 1962* [holotypus]

Syn.: *Origanetalia vulgaris* T.MÜLLER 1961* p. p. [Art. 8]

Origanetalia vulgaris T.MÜLLER 1962* p. p. [typo excl.]

Xero-Brometalia DOING 1963* p. p. [Art. 8]
Antherico ramosi-Geranietalia sanguinei JULVE 1993* [Art. 5, 8]

Incl.: *Galio littoralis-Geranion sanguinei* GÉHU & GÉHU-FRANCK in DE FOUCAULT et al. 1983*

C: *Campanula rapunculoides*, *Dictamnus albus*, *Geranium sanguineum*, *Melittis melissophyllum*, *Peucedanum cervaria*, *P. oreoselinum*, *Polygonatum odoratum*, *Tanacetum corymbosum*, *Thalictrum minus*, *Trifolium alpestre*, *T. rubens*, *Veronica teucrium*, *Vicia tenuifolia*, *Vincetoxicum hirundinaria*, *Viola hirta*

D: *Bromus erectus*, *Bupleurum falcatum*, *Medicago falcata*, *Salvia pratensis*, *Sanguisorba minor*, *Stachys recta*, *Teucrium chamaedrys*

4.8.5 Typifications

Origanetalia vulgaris T.MÜLLER 1962*: 98:

Trifolium medii T.MÜLLER 1962*: 121 [lectotypus DENGLER hoc loco]

Geranion sanguinei TX. in T.MÜLLER 1962*: 98:

Geranio-Peucedanetum cervariae T.MÜLLER 1962*: 110 [lectotypus DENGLER hoc loco]

Trifolium medii T.MÜLLER 1962*: 121:

Trifolio medii-Agrimonietum eupatoriae T.MÜLLER 1962*: 123 [lectotypus DENGLER hoc loco]

Agrimonia eupatoria-*Trifolietum medii* T.MÜLLER 1962*: 123 nom. invers. propos. (original form: *Trifolio medii-Agrimonietum*):

MÜLLER (1966: tab. 18, rel. 27) [neotypus DENGLER hoc loco] – The inversion of the name is proposed following ICPN Art. 42, since *Trifolium medium* dominates the majority of the stands of the association in the region of the original diagnosis (Southern Germany; e.g. MÜLLER [1966: tab. 18]). Furthermore, *Agrimonia eupatoria* is rare or even absent in the North German stands of the association (cf. DENGLER in BERG 2001b: 166, DENGLER et al. 2001 and

unpublished observations from Lower Saxony and Schleswig-Holstein).

Geranio-Trifolietum alpestris T.MÜLLER 1962*: 112:

MÜLLER (1966: tab. 18, rel. 15) [neotypus DENGLEHOC loco]

Lathyro-Melampyretum pratensis PASSARGE 1967*: 157:

PASSARGE (1979: tab. 1, rel. 1) [neotypus DENGLEHOC loco]

Pteridietum aquilini JOUANNE & CHOUARD 1929*: 977:

Pteridium aquilinum 4, *Holcus mollis* 2b, *Brachyhectium rutabulum* 2a, *Dicranum scoparium* 2m, *Lophocolea bidentata* 2m, *Anthoxanthum odoratum* 1, *Rubus corylifolius* agg. (H) 1, *Stellaria holostea* 1, *Rubus idaeus* +, *Vaccinium myrtillus* +, *Betula pendula* (H) r; number of species 11, relevé area 5 m², cover herb layer 80%, cover cryptogam layer 10%, fringe within a forest, pH (H₂O) = 3.6, Lower Saxony: administrative district Lüchow-Danzenberg, MTB 2832/1, RW 4435.004 km, HW 5891.800 km, 04.06.02 – relevé taken from EISENBERG (2003: tab. 1, rel. 15 = serial no. 16) [neotypus EISENBERG & DENGLEHOC loco]

Trifolio-Melampyretum nemorosi DIERSCHKE 1973*:

DIERSCHKE (1973: tab. 1, rel. 19) [lectotypus DENGLEHOC loco]

4.9 Artemisietea vulgaris LOHMEYER et al. ex VON ROCHOW 1951

4.9.1 General concept

In the recent phytosociological literature, ruderal plant communities dominated by biennial or perennial plants are usually subdivided into 3 or 4 classes: Agropyretea intermedio-repentis OBERD. et al. ex T.MÜLLER & GÖRS 1969*, Artemisietea vulgaris LOHMEYER et al. ex VON ROCHOW 1951*, Epilobietea angustifolii TX. & PREISING ex VON ROCHOW 1951* and Galio-Urticetea PASSARGE ex KOPECKÝ 1969*. A class Agropyretea intermedio-repentis of semi-ruderal Couch-swards can not be retained using a method based on character species, since the most of the character species that are mentioned for example by MÜLLER (1983b), such as *Convolvulus arvensis*, *Poa angustifolia*, *P. compressa*, *Cerastium arvense* and *Equisetum arvense*, are equally frequent or even more frequent in other classes (cf. the synoptic table of all the classes in BERG et al.

2001b). Only the few character species mentioned in section 4.9.3 would be possibilities, but they are so rare that none of them would occur in the majority of the stands of such a class. On the other hand there are numerous character and differential species of the Artemisietea vulgaris which frequently form part of the semi-ruderal Couch-swards, even though they do not achieve high coverages there. They could therefore reasonably be treated as the central syntaxon of a broadly conceived ruderal class Artemisietea vulgaris (DENGLEHOC 1997), a course which has been followed by many recent taxonomic overviews (e.g. MUCINA 1993c; POTT 1995; KLOTZ in SCHUBERT et al. 2001; RENNWALD 2002; RIVAS-MARTÍNEZ 2002). When elaborating the 'Plant communities of Mecklenburg-Vorpommern', it proved to be advantageous, according to the classificatory principles of DENGLEHOC & BERG (2002), to dissolve the class Galio-Urticetea which had at first been accepted. Instead, the communities usually included in it should be divided according to floristic and ecological criteria into the classes Phragmito-Magno-Caricetea KLIKA in KLIKA & V.NOVÁK 1941* und Artemisietea vulgaris. Finally, the class Epilobietea angustifolii, usually comprising both herbaceous and shrub communities from clearings, loses its justification when classifying vegetation within structural types as we have done. One part of this shrub and pioneer-forest community belongs to the class Rhamno-Prunetea RIVAS GODAY & BORJA CARBONELL ex TX. 1962*, and the other possibly to a separate class of ruderal woody plant communities. Due to the high constancy of different Artemisietea-species, the herbaceous communities from clearings can reasonably be added to that class as well (cf. DENGLEHOC 2003: 193, 195). According to these suggested emendations (cf. the tables in DENGLEHOC 2001d), the Artemisietea vulgaris then comprise all ruderal and nitrophytic fringe communities dominated by biennials and perennials from sites with deep water tables. The four previous classes (or large parts of them) which are united here are floristically at least independent enough that they should be treated as subclasses, particularly as three of them each contain two orders: (a) Epilobienaea angustifolii (TX. & PREISING ex VON ROCHOW 1951*) RIVAS GODAY &

BORJA CARBONELL 1961* (herbaceous communities from clearings) with the single order *Atropetalia bellae-donnae* TX. 1947*; (b) *Lamio albi-Urticenea dioicae* (see 4.9.2); (c) *Agropyreneae intermedio-repentis* (see 4.9.3) and (d) *Artemisienea vulgaris* (LOHMEYER et al. ex VON ROCHOW 1951*) RIVAS GODAY & BORJA CARBONELL 1961* (= *Onopordenea acanthii* RIVAS-MARTÍNEZ et al. in RIVAS-MARTÍNEZ et al. 2002* nom. illeg. [Art. 29c]; perennial ruderal communities of dry sites) containing the two orders *Onopordetalia acanthii* BR.-BL. & TX. ex KLIKA & HADAČ 1944b* (temperate Europe) und *Carthametalia lanati* BRULLO in BRULLO & MARCENÒ 1985* (Mediterranean basin).

4.9.2 *Lamio albi-Urticenea dioicae* DENGLER & WOLLERT subcl. nov. hoc loco

The delimitation of this subclass partly corresponds to that of the former (sub-) class *Galio-Urticenea/-etea*. By contrast, tall-herb communities of moist to wet sites (*Convolvuletalia sepium* TX. 1950* nom. inval. [Art. 8]) have been excluded. Instead, the alliance *Arction lappae* TX. 1937*, which MÜLLER (1983a) subordinated to the subclass *Artemisienea vulgaris*, is included here on floristic grounds (cf. DENGLER 1997). The new subclass thus comprises two orders: the *Galio-Alliarietalia petiolatae* OBERD. in GÖRS & T.MÜLLER 1969*, which contain nitrophytic fringe communities from sites with intermediate soil moisture and which can be further subdivided into at least two alliances (*Geo urbani-Alliarion petiolatae* LOHMEYER & OBERD. in GÖRS & T.MÜLLER 1969*, *Aegopodium podagrariae* TX. 1967*). As regards the second order *Arctio lappae-Artemisietalia vulgaris* DENGLER 2002* (= *Artemisietalia vulgaris* sensu MÜLLER 1983a*, non TX. 1947*)⁶,

which comprises perennial ruderal communities from sites with intermediate soil moisture, so far only the membership of the alliance *Arction lappae* TX. 1937* is certain.

- Type: *Galio-Alliarietalia petiolatae* OBERD. in GÖRS & T.MÜLLER 1969*: 154 [holotypus]
 Syn.: *Artemisienea vulgaris* sensu RIVAS-MARTÍNEZ et al. 1991*, non (LOHMEYER et al. ex VON ROCHOW 1951*) RIVAS GODAY & BORJA CARBONELL 1961* [Art. 24a]
Galio-Urticenea (PASSARGE ex KOPECKÝ 1969*) T.MÜLLER 1983a* p. max. p. [typo excl.]
Alliario-Glechomenea herbaceae RIVAS-MARTÍNEZ & COSTA 1998* p. p. [Art. 5, 8]
Artemisienea vulgaris sensu Rivas-Martínez 2002*, non (LOHMEYER et al. ex VON ROCHOW 1951*) RIVAS GODAY & BORJA CARBONELL 1961* p. p. [descr. incl., typo excl.]
 Incl.: *Galio-Urticetea* PASSARGE 1967* p. p. [Art. 3b]
Galio-Urticetea PASSARGE ex KOPECKÝ 1969* p. p. [typo excl.]

Calystegia sepium is absent from the listed relevés of the *Petasito hybridi-Aegopodietum podagrariae*, which is the holotype of the alliance. However, ICPN Art. 3f only requires that the name-giving taxon must be indicated in the original diagnosis but not that it must be present in the relevés of its type association. Moreover, the ICPN does not give a precise definition of what belongs to an original diagnosis. But in ICPN Art. 7, it is made clear that the relevés are not the original diagnosis itself but only form part of it. In this sense those relevés published in the original diagnosis of an alliance, but not included in a validly published association, as well as the verbal description must also be considered as part of the protologue. However, the relevé of the *Convolvulo sepium-Cuscutetum europaeae* TX. 1947* nom. inval. [Art. 3f] subordinated to the *Calystegion* includes *Calystegia sepium*, so that the alliance is validly published in our opinion. Furthermore, Dr. W. WILLNER (in litt.) supports the opinion that the *Arction lappae* TX. 1937* must be considered as holotype of the order *Artemisietalia vulgaris*, since TÜXEN (1947: 176) would have given 'unambiguous' reference to TÜXEN (1937), where the *Arction lappae* is validly published. We can not accept this opinion since the source citation on the page referred to is not placed in any relationship to the order *Artemisietalia vulgaris* or the *Arction lappae*.

⁶ In DENGLER (2002: 66) a detailed account is given of the reasons why none of the previous names can be used for this order. The new order name mentioned here is published there to replace the pseudonym *Artemisietalia vulgaris* TX. 1947*. Dr. W. WILLNER, Vienna, as member of the CNC (in litt.), supports the view that the argumentation in DENGLER (l.c.) is not correct. In his opinion, the *Calystegion sepium* is not validly published by TÜXEN (1947) according to ICPN Art. 3f, since

- Excl.: Convolvuletales sepium TX. 1950* [Art. 8]
 C: *Aegopodium podagraria*, *Alliaria petiolata*, *Anthriscus sylvestris*, *Arctium lappa*, *Armoracia rusticana*, *Artemisia verlotiorum*, *Carduus crispus*, *Chaerophyllum aureum*, *Cruciata laevipes*, *Galium aparine*, *Geum urbanum*, *Glechoma hederacea*, *Helianthemum tuberosus*, *Lamium album*, *Lamium maculatum*, *Leonurus cardiaca*, *Rumex obtusifolius*, *Galeopsis pubescens*, *Urtica dioica*
 D: *Artemisia vulgaris* (with Agropyreneae and Artemisieneae), *Elymus repens* (with Agropyreneae and Artemisieneae), *Galeopsis tetrahit* (with Epilobieneae), *Heracleum sphondylium* (excl. subsp. *elegans*), *Poa trivialis*
 Note: The name Galio-Urticeneae (PASSARGE ex KOPECKÝ 1969*) T.MÜLLER 1983a* can not be used for this subclass because it would then have to be typified with one of the orders included in our system. This is not possible, however, since KOPECKÝ (1969: 250), according to ICPN Art. 8, did not publish the order Lamio albi-Chenopodietalia bonihenrici validly and therefore only one of the two other orders (Convolvuletales sepium and Petasito-Chaerophylletalia respectively) are possible lectotypes. Both of them are validly published names because either unambiguous reference to validly published alliances is given or alliances are validly published anew by documenting subordinate associations with relevés. However, as we now understand them, these two orders do not belong to the class Artemisietea vulgaris but to the Phragmito-Magno-Caricetea KLIKA in KLIKA & V.NOVÁK 1941* (as in BERG et al. 2003) or to a separate class of tall-herb and fringe communities from hydromorphic sites (Filipendulo-Convolvuletea GÉHU & GÉHU-FRANCK 1987*). The name Alliario-Glechomeneae herbaceae RIVAS-MARTÍNEZ & COSTA 1998* is not validly published, since these authors actually designate a type order (Glechometalia hederaceae TX. & BRUN-HOOL 1975*) but fail to give a bibliographic reference to its protologue.

4.9.3 Agropyreneae intermedio-repentis (OBERD. et al. ex T.MÜLLER & GÖRS 1969) DENGLER & WOLLERT subcl. nov. hoc loco

This subclass comprises semi-ruderal communities from sites of medium to low soil moisture, mostly dominated by rhizomatous geo-

phytes. In addition to the type order Agropyretalia intermedio-repentis OBERD. et al. ex T.MÜLLER & GÖRS 1969*, with the three alliances Convolvulo arvensis-Agropyrrion repentis GÖRS 1966*, Poion compressae (see 4.9.5) und Artemisio absinthii-Agropyrrion intermedii T.MÜLLER & GÖRS 1969*, we include as second order the newly described Rubo caesii-Calamagrostietalia epigeji (see 4.9.4). As mentioned above, the Agropyreneae intermedio-repentis form the mainly negatively characterised central subclass of the Artemisietea vulgaris.

- Protologue: 'Agropyreteae intermedii-repentis OBERD., TH. MÜLL. & GÖRS 67' (MÜLLER & GÖRS 1969: 212)
 Type: Agropyretalia intermedio-repentis OBERD. et al. ex T.MÜLLER & GÖRS 1969*: 211 [holotypus (Art. 27 a)]
 Syn.: Artemisieneae vulgaris sensu RIVAS-MARTÍNEZ 2002*, non (LOHMEYER et al. ex VON ROCHOW 1951*) RIVAS GODAY & BORJA CARBONELL 1961* p. p. [descr. incl., typo excl.]
 Incl.: Agropyreteae repentis OBERDORFER et al. 1967* [Art. 8]
 C: *Asparagus officinalis*, *Bromus inermis*, *Falcaria vulgaris*, *Rumex thyrsiflorus*, *Silene tatarica*
 D: *Achillea millefolium* agg. (with Artemisieneae), *Artemisia vulgaris* (with Galio-Urticeneae and Artemisieneae), *Ceratodon purpureus* (with Artemisieneae), *Convolvulus arvensis* (with Artemisieneae), *Elymus repens* (with Galio-Urticeneae and Artemisieneae), *Poa angustifolia* (with Artemisieneae)

4.9.4 Rubo caesii-Calamagrostietalia epigeji DENGLER & WOLLERT ord. nov. hoc loco

In the original diagnosis of the class Agropyreteae intermedio-repentis in MÜLLER & GÖRS (1969), ruderal swards with *Calamagrostis epigejos* were not included. In later treatises, such as GUTTE & HILBIG (1975), BRANDES (1986), WOLLERT (1991), KLOTZ (in SCHUBERT et al. 2001) or RENNWALD (2002), the stands in question, on account of their structural similarity, i.e. the dominance of a rhizomatous grass-species, are often included in the alliance Convolvulo-Agropyrrion GÖRS 1966* within this class, mostly as informal communi-

ties. As discussed in DENGLER (1997), in addition to the ruderal community dominated by Wood Small-reed (*Rubo caesii*-*Calamagrostietum epigeji* COSTE 1985*), there are two associations closely resembling this in terms of their species composition, structure and site conditions: the common *Elymo repentis*-*Rubetum caesii* DENGLER 1997* and the *Petasitetum spurii* STEFFEN 1931* nom. mut. propos. a rare and special community on the coast of the Baltic Sea and in stream valleys in regions with a (sub-)continental climate. Because of their deviating characteristics, these three associations were then united in a suballiance of their own within the *Convolvulo-Agropyrion*, named *Rubo-Calamagrostienion epigeji* DENGLER 1997*. When revising the numerous *Agropyreneae*-communities described from Central Europe (DENGLER in prep.), it appeared to be appropriate to introduce further hierarchical levels to reflect better the similarity relationships between the individual associations, or to make them classifiable at all using the central syntaxon concept. In DENGLER (2003: 109), the advantages of 'graduated' hierarchies over 'flat' ones from the point-of-view of information theory are pointed out, and are illustrated using the example of the Central European *Agropyreneae*-communities (l.c.: 204). Four groups of associations could thus be worked out, which are treated here as alliances. One of these, the *Rubo caesii*-*Calamagrostion epigeji* raised to alliance level (see 4.9.5), differs so much from the three others that it should be separated from them within a new monotypic order. This classification scheme was outlined for the first time and confirmed in a synoptic table in DENGLER (2001d), though without the alliance *Artemisio absinthii-Agropyrion intermedii* T.MÜLLER & GÖRS 1969* which is distributed in warm-continental regions and is therefore absent from Mecklenburg-Vorpommern.

Type: *Rubo caesii*-*Calamagrostion epigeji* (DENGLER 1997*) DENGLER & WOLLERT hoc loco: 4.9.5 [holotypus]

Syn.: *Agropyretalia intermedio-repentis* OBERD. et al. ex T.MÜLLER & GÖRS 1969* sensu auct. p. p. [typo excl.]

C: *Calamagrostis epigejos*, *Rubus caesius*

D: *Equisetum arvense*, *Galium mollugo* agg.

4.9.5 *Rubo caesii*-*Calamagrostion epigeji* (DENGLER 1997) DENGLER & WOLLERT all. nov. hoc loco

For the reasons for the erection and composition of this alliance, see 4.9.4. All three associations included can be characterised as tall-growing, ruderal communities of dry to medium moist sites, dominated by rhizomatous geophytes.

Protologue: '*Rubo-Calamagrostienion epigeji*'
(DENGLER 1997: 278)

Type: *Saponario-Petasitetum spurii* ['PASSARGE ex'] WALTHER 1977*: 14 (= *Petasitetum spurii* STEFFEN 1931* nom. mut. propos.) [holotypus (Art. 27 a)]

Syn.: *Hyperico-Vicion angustifoliae* PASSARGE 1975* p. min. p. [typo excl.]

C/D: [to be dropped because it is the sole alliance within the order]

4.9.6 *Poion compressae* T.MÜLLER & GÖRS ex DENGLER & WOLLERT all. nov. hoc loco

MÜLLER & GÖRS (1969) had already realised the autonomy of the semi-ruderal swards of *Poa compressa*, which they therefore removed as an association group separate from the other communities of the *Convolvulo-Agropyrion* T.MÜLLER & GÖRS 1969*. In this association group they included the *Poo compressae-Tussilaginetum farfarae* TX. 1931* and the *Poa compressa-Anthemis tinctoria*-community (= *Poo compressae-Anthemidetum tinctoriae* T.MÜLLER & GÖRS ex BRANDES 1986*). DENGLER (1997) was able to demonstrate by use of affinity calculations that these two associations do indeed differ considerably from all other *Convolvulo-Agropyrion* associations and are floristically even slightly more closely related to the alliance *Dauco-Melilotion* GÖRS ex ROSTAŃSKI & GUTTE 1971* (subclass *Artemisienea*). However, a revision of table material of the class *Artemisietea vulgaris* from the whole of Central Europe (DENGLER in prep.) has revealed that the *Poa compressa* communities should best be treated as an alliance of their own, but within the *Agropyretalia intermedio-repentis*. This classification concept was adopted for the first time in DENGLER (2001d). In addition to the two associations already mentioned by MÜLLER & GÖRS (1969),

the *Poetum humili-compressae* BORNKAMM 1961* nom. mut. propos. is included here as a central association.

Type: *Poo compressae-Tussilaginetum farfarae* TX. 1931*: 84 [holotypus]

Incl.: *Anthemido-Poenion compressae* PASSARGE 1989* p. p. [typo excl.]
'Assoziationsgruppe mit *Poa compressa*' [Convolvulo arvensis-Agropyrion repentis] sensu T.MÜLLER & GÖRS 1969*

C: *Poa compressa*

D: *Anthemis tinctoria* (with *Artemisio-Agropyrion intermedii*), *Artemisia vulgaris* (with *Convolvulo-Agropyrion repentis*), *Dactylis glomerata* (with *Convolvulo-Agropyrion repentis*), *Medicago lupulina*, *Taraxacum* sect. *Ruderalia* (with *Convolvulo-Agropyrion repentis*)

4.9.7 *Stachyo sylvaticae-Dipsacetum pilosi* (TX. ex OBERD. 1957) PASSARGE ex WOLLERT & DENGLER nom. nov. hoc loco

Protologue: 'Cephalarietum pilosae (TX. 42)' (OBERDORFER 1957: 78) [Art. 32b]

Type: *Urtica dioica* 4, *Brachytheceium rutabulum* 3, *Plagiomnium undulatum* 3, *Poa trivialis* 3, *Dipsacus pilosus* 2, *Brachytheceium rivulare* 1, *Carex acutiformis* 1, *Eurhynchium hians* 1, *Geum urbanum* 1, *Plagiomnium cuspidatum* 1, *Brachypodium sylvaticum* +, *Circaea lutetiana* +, *Cirsium oleraceum* 1, *Impatiens parviflora* 1, *Chaerophyllum temulum* +, *Eurhynchium striatum* +, *Galium aparine* +, *Galeopsis speciosa* +, *Geranium robertianum* +, *Glechoma hederacea* +, *Impatiens noli-tangere* +, *Silene dioica* +; number of species 22, relevé area 20 m², Mecklenburg-Vorpommern: Western Pomerania: Peene valley south of Klein Markow – relevé taken from BOLBRINGER & WOLLERT 2000: tab 1, rel. 7) [neotypus: WOLLERT & DENGLER hoc loc]

Syn.: *Cephalarietum pilosae* ['JOUANNE 1927'] sensu BOLBRINKER & WOLLERT 2000*, non JOUANNE & CHOUARD 1929*

Dipsacetum pilosi TX. 1942 [Art. 1, 3 b]
Stachyo-Dipsacetum pilosi (TX. ex OBERD. 1957*) PASSARGE 2002* [Art. 3i]

Incl.: *Galeopsis speciosa-Dipsacus pilosus*-Ges. sensu PASSARGE 1957a*, PASSARGE 1967*

C: *Dipsacus pilosus*
D: *Circaea lutetiana*, *Festuca gigantea*, *Impatiens noli-tangere*, *Stachys sylvatica* (all with *Epilobio montani-Geranium robertianum*), *Calystegia sepium*, *Carduus crispus*, *Silene dioica*

Note: JOUANNE & CHOUARD (1929: 988) explicitly described an alder-ash-forest association under the (illegitimate) name *Dipsacetum pilosi*. A tall-herb community with *Dipsacus pilosus* was published by OBERDORFER (1957) for the first time. However, he used the name *Cephalarietum pilosae* which as a later homonym is illegitimate. The replacement of this name with a *nomen novum* by PASSARGE (2002) therefore was legitimate, but according to ICPN Art. 3i the new name was not published validly by him.

4.9.8 Typifications

Artemisietalia vulgaris TX. 1947*: 276:

Calystegion sepium TX. 1947*: 276 [lectotypus DENGLER & WOLLERT hoc loco] – The reasons are given in DENGLER (2002: 66) as to why this alliance is the only possible type element according to ICPN. Since the order with the *Arction lappae* TX. 1947* nom. inval. [Art. 8] comprises another alliance, the type alliance, in contrast to the conclusions of DENGLER (l.c.), is for formal reasons not a holotype but a lectotype.

Agropyretalia intermedio-repentis OBERD. et al. ex T.MÜLLER & GÖRS 1969*: 211:

Convolvulo-Agropyrion GÖRS 1966*: 530 [lectotypus DENGLER & WOLLERT hoc loco]

Galio-Alliarietalia petiolatae OBERD. in GÖRS & T.MÜLLER 1969*: 154:

Geo-Alliarion LOHMEYER & OBERD. in GÖRS & T.MÜLLER 1969*: 161 [lectotypus DENGLER & WOLLERT hoc loco]

Onopordetalia acanthii BR.-BL. & TX. ex KLIKA & HADAČ 1944b: 291:

Onopordion ['BR.-BL. 1926'] BR.-BL. ex KLIKA & HADAČ 1944b*: 291 (= *Onopordion acanthii* BR.-BL. in BR.-BL. et al. 1936*) [lectotypus (Art. 20)]

Aegopodion podagrariae TX. 1967*: 440:

Agropyro repentis-Aegopodietum podagrariae TX. 1967*: 434 (= *Urtico dioicae-Aegopodietum podagrariae* TX. ex GÖRS 1968* nom. cons. propos.) [lectotypus DENGLER & WOLLERT hoc loco]

- Dactylo-Aegopodium PASSARGE 1967*: 157:
Arctietum nemorosi TX. ex PASSARGE 1967*
[‘TX. (1931) 1950’]: 157 [lectotypus DENGLER
& WOLLERT hoc loco]
- Dauco-Melilotion GÖRS ex ROSTAŃSKI & GUTTE
1971*: 173:
Centaureo diffusae-Berteroetum OBERD. 1957*:
69 (= Berteroetum incanae SISSINGH & TIDEMAN
in SISSINGH 1950*) [lectotypus DENGLER &
WOLLERT hoc loco] – GÖRS (1966) only
published the alliance provisionally (ICPN Art.
3b), and OBERDORFER et al. (1967) did not vali-
date it (ICPN Art. 8). The validation selected
here is thus probably the earliest one.
- Epilobion angustifolii TX. ex OBERD. 1957*: 98:
Epilobio angustifolii-Senecionetum sylvatici TX.
1937*: 36 (= Senecioni-Epilobietum angustifolii
HUECK 1931*) [lectotypus DENGLER & WOL-
LERT hoc loco]
- Geo-Alliarion LOHMEYER & OBERD. in GÖRS &
T.MÜLLER 1969*: 161:
Chelidonio-Alliarium officinalis GÖRS &
T.MÜLLER 1969*: 161 (= Alliarium-Chaerophyl-
lytetum temuli LOHMEYER ex OBERD. 1957*)
[lectotypus DENGLER & WOLLERT hoc loco]. –
The assessment of this association name as ille-
gitimate according to ICPN Art. 29 by MUCINA
(1993d: 210) is not accurate. It is true that GÖRS
& MÜLLER (1969) summarised three existing as-
sociations in their Chelidonio-Alliarium, but all
of them – in the cited form – are ineffectively or
invalidly published names.
- Onopordion acanthii BR.-BL. in BR.-BL. et al.
1936*: 27:
Onopordetum acanthii BR.-BL. in BR.-BL. et al.
[‘1926’] 1936*: 29 (= Onopordetum acanthii
LIBBERT 1932*) [lectotypus (Art. 20)]
- Agropyretum repentis FELFÖLDY 1942*:
FELFÖLDY (1942: tab. 3, rel. 2) [lectotypus
DENGLER & WOLLERT hoc loco] – The name
would thus be an earlier syntaxonomic synonym
of the Convolvulo arvensis-Agropyretum repen-
tis FELFÖLDY 1943* nom. invers. propos. We
propose to reject it as a *nomen ambiguum*, since
on the one hand two of the five relevés in the
protologue now belong to different associations
(rel. 4: Leonuro-Ballotetum nigrae, alliance
Arction lappae; rel. 5: Falcario-Agropyretum),
whilst on the other hand numerous associations
with very different contents have been described
under the name ‘Agropyretum repentis’ (cf.
TÜXEN 1976: 46, 153).
- Alliarium-Chaerophylletum temuli LOHMEYER ex
OBERD. 1957*: 77:
Chaerophyllum temulum 3, *Galium aparine* 2,
Geum urbanum 2, *Poa trivialis* 2, *Alliaria
petiolata* 1, *Dactylis glomerata* 1, *Lamium
album* 1, *Urtica dioica* 1, *Anthriscus sylvestris*
+, *Calystegia sepium* +, *Galeopsis tetrahit* +,
Glechoma hederacea +, *Impatiens parviflora* +,
Poa nemoralis +, *Taraxacum* sect. *Ruderalia* +,
Viola reichenbachiana +; number of species 16,
forest fringe exposed SE, Germany: Leine-
Werra hilly region – relevé taken from
DIERSCHKE (1974: tab. 9, rel. 12) [neotypus
DENGLER & WOLLERT hoc loco]
- Arctietum lappae FELFÖLDY 1942*
FELFÖLDY (1942: tab. 13, rel. 1) [lectotypus
DENGLER & WOLLERT hoc loco] – This name
thus becomes an earlier syntaxonomic synonym
of the Arctio lappae-Artemisietum vulgaris
OBERD. et al. ex SEYBOLD & T.MÜLLER 1972*.
As it has commonly been used in the sense of
the Leonuro-Ballotetum nigrae SLAVNIĆ 1951*
(e.g. MUCINA 1993c; SCHUBERT et al. 2001) we
propose its rejection as *nomen ambiguum*.
- Arctietum nemorosi TX. ex OBERD. 1957*: 103:
Arctium nemorosum 3, *Rubus fruticosus* agg. (H)
3, *Lapsana communis* 2a, *Pinus sylvestris* (T)
2a, *Plagiomnium affine* 2a, *Barbula unguiculata*
2m, *Brachythecium rutabulum* 2m, *Dicranella
staphylina* 2m, *Hypnum cupressiforme* var.
cupressiforme 2m, *Poa trivialis* subsp. *trivialis*
2m, *Rhynchospora squarrosus* 2m, *Agrostis
stolonifera* 1, *Carex hirta* 1, *Cerastium holo-
steoides* 1, *Cirsium vulgare* 1, *Elymus repens*
subsp. *repens* 1, *Galium aparine* 1, *Ranunculus
repens* 1, *Stellaria media* 1, *Veronica cha-
maedrys* 1, *Achillea millefolium* agg. +, *Capsella
bursa-pastoris* +, *Crataegus* sp. (H) +, *Festuca
gigantea* +, *Hypericum perforatum* +, *Moeh-
ringia trinervia* +, *Prunella vulgaris* +, *Rubus
idaeus* +, *Taraxacum* sect. *Ruderalia* +, *Torilis
japonica* +, *Trifolium repens* +, *Anthriscus
sylvestris* r; number of species 32, relevé area
5 m², cover tree layer 10%, cover herb layer
60%, cover cryptogam layer 10%, fringe within
a forest, pH (H₂O) = 7.5, Lower Saxony:
administrative district Lüchow-Dannenberg,
MTB 2832/3, RW 4433.439 km, HW 5887.140
km, 31.07.02 – relevé taken from EISENBERG
(2003: tab. II, rel. 154 = serial no. 49) [neotypus
EISENBERG, DENGLER & WOLLERT hoc loco]
- Arctio tomentosum-Rumicetum obtusifolii PASSARGE
1959*:
PASSARGE (1959: tab. 18, rel. 4) [lectotypus
DENGLER & WOLLERT hoc loco]
- Artemisietum vulgaris SCHREIER 1955*:
SCHREIER (1955: tab. 2, rel. 5) [lectotypus
DENGLER & WOLLERT hoc loco] – This name
thus becomes a later syntaxonomic synonym of
the Tanaceto-Artemisietum SISSINGH 1950*.
- Asparago-Chondrillietum juncea PASSARGE 1978 b*:
PASSARGE (1978b: tab. 3, rel. 1) [lectotypus
DENGLER & WOLLERT hoc loco]

Calamagrostietum epigeji JURASZEK 1927*:

JURASZEK (1927: tab. 8, rel. 2) [lectotypus DENGLER & WOLLERT hoc loco] – This name would thus be an earlier syntaxonomic synonym of the *Rubo caesii*-*Calamagrostietum epigeji* COSTE 1985*. Since it has been mostly used in the literature in a different sense, i.e. for a community from forest clearings, it should be rejected as a *nomen ambiguum*.

Cichorietum intybi TX. ex SISSINGH 1969*:

SISSINGH (1969: tab. 4, rel. 2) [lectotypus DENGLER & WOLLERT hoc loco]

Circaeetum lutetianae KAISER 1926* (≡ *Stachyo sylvaticae*-*Impatientetum noli-tangere* Passarge ex HILBIG 1972* nom. illeg. [Art. 29c], *Galio aparines*-*Impatientetum noli-tangere* TX. in TX. & BRUN-HOOL 1975* nom. illeg. [Art. 29c]): KAISER (1926: tab. 144, rel. 1) [lectotypus DENGLER & WOLLERT hoc loco] – Within the syntaxonomic system of BERG et al. (2001b, 2003) the name thus becomes an earlier syntaxonomic synonym of the *Epilobio montani*-*Geranietum robertiani* LOHMEYER ex GÖRS & T.MÜLLER 1969* (see below).

Convolvulo arvensis-*Agropyretum repentis* FELFÖLDY 1943* nom. cons. et invers. propos. (original form: *Agropyro repentis*-*Convolvuletum arvensis*):

FELFÖLDY (1943: tab. 4, rel. 6) [lectotypus DENGLER & WOLLERT hoc loco] – The inversion of the name is proposed according to ICPN Art. 42, because *Elymus repens* dominates in five out of six relevés in the protologue over *Convolvulus arvensis* (in the 6th they have the same cover-abundance-value). This widely used association name should be protected against the earlier *Agropyretum repentis* FELFÖLDY 1942*. It is not a *nomen novum* for this since FELFÖLDY (1943) did not refer explicitly to it. The author citation with brackets, which usually appears in the literature, is not authorised.

Corydalido claviculatae-*Epilobietum angustifolii* HÜLBUSCH & TX. 1968*:

HÜLBUSCH & TÜXEN (1968: tab., rel. 8) [lectotypus DENGLER & WOLLERT hoc loco]

Corynephorosilenetum tataricae LIBBERT 1931*:

LIBBERT (1931: tab. 3, rel. 12) [lectotypus DENGLER & WOLLERT hoc loco]. – This name thus becomes a syntaxonomic synonym of the *Petasitetum tomentosum* STEFFEN 1931*.

Diploxia tenuifoliae-*Agropyretum repentis* PHILIPPI in T.MÜLLER & GÖRS 1969*: 214:

FISCHER (1982: tab. 1, rel. 10) [neotypus DENGLER & WOLLERT hoc loco]

Epilobio montani-*Geranietum robertiani* LOHMEYER ex GÖRS & T.MÜLLER 1969*: 163 nom. cons. propos.:

Geranium robertianum 5, *Epilobium montanum* 1, *Geum urbanum* 1, *Lapsana communis* 1, *Sambucus nigra* (H) 1, *Taraxacum* sect. *Ruderalia* 1, *Anthriscus sylvestris* +, *Cerastium holosteoides* +, *Chaenorhinum minus* +, *Chaerophyllum temulum* +, *Dactylis glomerata* +, *Galeopsis tetrahit* +, *Medicago lupulina* +, *Moehringia trinervia* +, *Poa nemoralis* +, *Rosa canina* (H) +, *Torilis japonica* +, *Viola reichenbachiana* +; number of species 18, forest fringe exposed W, Germany: Leine-Werra hilly region – relevé taken from DIERSCHKE (1974: tab. 11, rel. 1) [neotypus DENGLER & WOLLERT hoc loco] – This association name, which is in current use, should be protected against the older name *Circaeetum lutetianae* KAISER 1926* (see above).

Falcario vulgaris-*Agropyretum repentis* T.MÜLLER & GÖRS 1969*: 214:

KORNECK (1974: tab. 12, rel. 3) [neotypus DENGLER & WOLLERT hoc loco]

Hieracio-Poetum compressae PETIT 1978*:

PETIT (1978: tab. 1, rel. 19/4) [lectotypus DENGLER & WOLLERT hoc loco] – This name thus becomes a later syntaxonomic synonym of the *Poetum humili-compressae* BORNKAMM 1961* nom. mut. propos.

Hyoscyamo nigri-*Conietum maculati* SLAVNÍČ 1951* nom. invers. propos. (original form: *Conio-Hyoscyametum nigri*):

SLAVNÍČ (1951: tab. 12, rel. 5) [lectotypus DENGLER & WOLLERT hoc loco] – The inversion of the name is proposed following ICPN Art. 42, since *Conium maculatum* in three out of six relevés of the protologue (including the type relevé) has a higher cover-abundance-value compared with *Hyoscyamus niger*, whereas *Hyoscyamus niger* dominates in only one relevé.

Leonuro-Ballotetum nigrae SLAVNÍČ 1951*:

SLAVNÍČ (1951: tab. 14, rel. 4) [lectotypus DENGLER & WOLLERT hoc loco] – The designation of a neotype by PASSARGE (1993: 361) was not authorised since the protologue comprises single relevés.

Linario vulgaris-*Echietum vulgaris* SLAVNÍČ 1951*:

SLAVNÍČ (1951: tab. 17, rel. 1) [lectotypus DENGLER & WOLLERT hoc loco] – This name thus becomes a later syntaxonomic synonym of the *Melilotetum albo-officinale* SISSINGH 1950*.

Petasitetum spurii STEFFEN 1931*: 260 nom. mut. propos. (original form: *Petasitetum tomentosum*):

Festuca rubra subsp. *arenaria* 3b, *Petasites spurius* 3a, *Brachythecium rutabulum* 2a, *Calamagrostis epigejos* 2a, *Carex arenaria* 2m, *Ceratodon purpureus* 1p, *Elymus repens* 1p, *Leymus arenarius* 1p, *Tortula ruraliformis* 1p, × *Calammophila baltica* +p; number of species 10, relevé area 25 m², cover herb layer 80%,

- cover cryptogam layer 10%, Mecklenburg-Vorpommern: Usedom, coastal-km 19.22, 18.05.94 – relevé taken from ISERMANN (1997: tab. A 9.16, rel. 1269 = serial no. 40) [neotypus DENGLER, ISERMANN & WOLLERT hoc loco]. – Since no relevé of this association from the region of the original diagnosis (coastal dunes of the Baltic Sea on the Courish Spit) has been available, we here designate a neotype which corresponds to these dunes at least ecologically (coastal dunes of the Baltic Sea in E Mecklenburg-Vorpommern). The *nomen mutatum* is proposed because the name *Petasites tomentosus* has not been used for the name-giving species for a long time; DINGWALL (in TUTIN et al. 1976: 188) did not even mention it as a synonym.
- Poetum humili-compressae BORNKAMM 1961* nom. mut. propos. (original form: Poetum ancipiti-compressae):
BORNKAMM (1961: tab. 5, rel. 7) [lectotypus DENGLER & WOLLERT hoc loco]
- Polygonetum cuspidati GÖRS & T.MÜLLER ex GÖRS 1975*:
GÖRS (1975: tab. 11, rel. 2) [lectotypus DENGLER & WOLLERT hoc loco]
- Poo compressae-Tussilaginetum farfarae TX. 1931*:
TÜXEN (1931: 85, rel. 2) [lectotypus DENGLER & WOLLERT hoc loco]
- Poo trivialis-Rumicetum obtusifolii HÜLBUSCH 1969*:
HÜLBUSCH (1969: tab., rel. 14) [lectotypus DENGLER & WOLLERT hoc loco]
- Rubo caesii-Calamagrostietum epigeji COSTE 1985*:
COSTE (1985: tab. 2, rel. 10) [lectotypus DENGLER & WOLLERT hoc loco]
- Saponario-Petasitetum spurii WALTHER 1977*:
WALTHER (1977: tab. 3, rel. 6) [lectotypus DENGLER & WOLLERT hoc loco] – This name thus becomes a later syntaxonomic synonym of the Petasitetum spurii STEFFEN 1931*. nom. cons. propos.
- Senecioni viscosi-Tussilaginetum farfarae SCHREIER 1955*:
SCHREIER (1955: tab. 4, rel. 7) [lectotypus DENGLER & WOLLERT hoc loco] – This name thus becomes a later syntaxonomic synonym of the Poo compressae-Tussilaginetum farfarae TX. 1931*.
- Tanaceto-Artemisietum SISSINGH 1950*:
SISSINGH (1950: tab. 32, rel. 8) [lectotypus DENGLER & WOLLERT hoc loco]
- Torilidietum japonicae LOHMEYER ex GÖRS & T.MÜLLER 1969*: 162:
Torilis japonica 3, *Brachythecium rutabulum* 2b, *Festuca rubra* agg. 2b, *Populus tremula* (T) 2b, *Calamagrostis epigejos* 2a, *Rubus corylifolius* agg. (H) 2a, *Stellaria holostea* 2a, *Plagionium affine* 2a, *Brachythecium rutabulum* (on wood litter) 2m, *Elymus repens* subsp. *repens* 2m, *Hypnum cupressiforme* var. *cupressiforme* 2m (epigeaic) and 2m (on wood litter), *Orthotrichum affine* 2m (on wood litter), *Poa angustifolia* 2m, *Scleropodium purum* 2m, *Agrostis capillaris* 1, *Galium aparine* 1, *Achillea millefolium* agg. +, *Artemisia vulgaris* +, *Convolvulus arvensis* +, *Hypericum perforatum* +, *Medicago lupulina* +, *Poa palustris* 1, *Rubus corylifolius* agg. (S) +, *Urtica dioica* +, *Vicia tetrasperma* r; number of species 23, relevé area 5 m², cover tree layer 20%, cover herb layer 90%, cover cryptogam layer 30%, fringe within a forest, pH (H₂O) = 7.6, Lower Saxony: administrative district Lüchow-Dannenberg, MTB 2832/1, RW 4433.991 km, HW 5891.927 km, 19.07.02 – relevé taken from EISENBERG (2003: tab. II, rel. 119 = serial no. 40) [neotypus EISENBERG, DENGLER & WOLLERT hoc loco]
- Urtico-Aegopodietum TX. ex GÖRS 1968* nom. cons. propos.:
GÖRS (1968: tab. 46, rel. 6) [lectotypus DENGLER & WOLLERT hoc loco] – This association name, which is in current use, should be protected against the older name *Agropyro repentis-Aegopodietum podagrariae* TX. 1967*.
- Urtico-Cruciatetum laevipedis DIERSCHKE 1973*:
DIERSCHKE (1973: tab. 2, rel. 11) [lectotypus DENGLER & WOLLERT hoc loco]

Acknowledgements

We express our thanks to Dr. Martina Herrmann and her colleagues for their help in the 'Tüxen archive' in Hannover. We are grateful to Britta Marquardt (Lüneburg) who assisted us with the preparation of the English version of this manuscript and to Dr. Adrian C. Pont (Oxford) who thoroughly checked and improved it linguistically. Finally we thank Prof. Dr. Klaus Dierßen (Kiel), as referee, for his helpful comments and suggestions.

References

- ABDANK, A.; BERG, C. & DENGLER, J. 2002: Gefährdungseinstufung von Pflanzengesellschaften – Vorgehen bei der „Roten Liste der Pflanzengesellschaften von Mecklenburg-Vorpommern“. – In: E. RENNWALD (ed.): Verzeichnis und Rote Liste der Pflanzengesellschaften Deutschlands – mit Datenservice auf CD-ROM. – Schriftenr. Vegetationskd. **35**: 49–63.
- AICHINGER, E. 1933: Vegetationskunde der Karawanken. – Pflanzensoziologie **2**: 1–329.
- ALLORGE, M. F. 1922: Thèses présentées à la faculté des sciences de Paris pour obtenir le grade de docteur ès-sciences naturelles – 1^{er} thèse: Les as-

- sociations végétales du Vexin français – 2^e thèse: Propositions données par la Faculté. – Nemours.
- BARKMAN, J. J.; MORAVEC, J. & RAUSCHERT, S. 1986: Code of phytosociological nomenclature – 2nd ed. [English – German – French]. – *Vegetatio* **67**: 145–195.
- BARTSCH, J. & BARTSCH, M. 1940: Vegetationskunde des Schwarzwaldes. – *Pflanzensoziologie* **4**: 1–229.
- BEGER, H. K. E. 1932: Praktische Richtlinien der strukturellen Assoziationsforschung im Sinne der von der Zürich-Montpellier-Schule geübten Methode: 481–526. – In: E. ABDERHALDEN (ed.), *Handbuch der biologischen Arbeitsmethoden* **11**(5). – Berlin.
- BERG, C.; TIMMERMANN, T. & DENGLER, J. 2001 a: Methodische Ansätze für eine „Rote Liste der Pflanzengesellschaften Mecklenburg-Vorpommerns“: Naturschutzfachliche Wertstufe. – *Ber. R.-Tüxen-Ges.* **13**: 217–221.
- BERG, C.; DENGLER, J. & ABDANK, A. 2001 b (eds.): Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung – Tabellenband. – Jena.
- BERG, C.; DENGLER, J.; ABDANK, A. & ISERMANN, M. 2003 (eds.): Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung – Textband. – Jena.
- BERGMEIER, E.; HÄRDLE, W.; MIERWALD, U.; NOWAK, B. & PEPLER, C. 1990: Vorschläge zur syntaxonomischen Arbeitsweise in der Pflanzensoziologie. – *Kiel. Not. Pflanzenkd. Schleswig-Holstein Hamburg* **20**: 92–110.
- BÖCHER, T. W. 1943: Studies on the plant geography of the North-Atlantic heath formation – II. Danish dwarf shrub communities in relation to those of Northern Europe. – *K. Dan. Vidensk. Selsk. Biol. Skr.* **2**(7): 1–130.
- BOJKO, H. 1934: Die Vegetationsverhältnisse im Seewinkel. Versuch einer pflanzensoziologischen Monographie des Sand- und Salzsteppengebietes östlich vom Neusiedler See. II. – *Bot. Cbl.*, 2. Abt., Beih. **51**: 600–747.
- BOLBRINKER, P. & WOLLERT, H. 2000: Das Cephalariaetum pilosae Jouanne 1927 in Mecklenburg. – *Bot. Rundbrief Mecklenb.-Vorpomm.* **34**: 19–24.
- BORNKAMM, R. 1960: Die Trespen-Halbrockenrasen im oberen Leinegebiet. – *Mitt. Florist.-Soziol. Arbeitsgem. N.F.* **8**: 181–208.
- BORNKAMM, R. 1961: Vegetation und Vegetationsentwicklung auf Kiesdächern. – *Vegetatio* **10**: 1–24.
- BRANDES, D. 1986: Ruderale Halbtrockenrasen des Verbandes Convolvulo-Agropyron GÖRS 1966 im östlichen Niedersachsen. – *Braunsch. Naturkd. Schr.* **2**: 547–564.
- BRANDES, D. 1990: Verbreitung, Ökologie und Vergesellschaftung von *Sisymbrium altissimum* in Nordwestdeutschland. – *Tuexenia* **10**: 67–82.
- BRANDES, S. & BRANDES, D. 1996: Flora und Vegetation von Dörfern im westlichen Sachsen-Anhalt. – *Braunsch. Naturkd. Schr.* **5**: 165–192.
- BRAUN, J. 1915: Cévennes méridionales (Massif de l'Aigoual) – Étude phytogéographique. – Genève.
- BRAUN-BLANQUET, J. 1931: Aperçu des Groupements végétaux du Bas-Languedoc. – *Commun. Stn. Intern. Géobot. Méditerr. Alpine* **9**: 35–40.
- BRAUN-BLANQUET, J. 1936: Über die Trockenrasengesellschaften des Festucion vallesiaca in den Ostalpen. – *Ber. Schweiz. Bot. Ges.* **46**: 169–189.
- BRAUN-BLANQUET, J. 1947: Les Groupements Végétaux supérieurs de la France: 19–32. – In: Service de la Carte des Groupements Végétaux de la France (ed.), *Instructions pour l'établissement de la Carte des Groupements Végétaux*. – Montpellier.
- BRAUN-BLANQUET, J. 1949: Übersicht der Pflanzengesellschaften Rätien (III). – *Vegetatio* **1**: 285–316.
- BRAUN-BLANQUET, J. 1950: Übersicht der Pflanzengesellschaften Rätien (VI). – *Vegetatio* **2**: 341–360.
- BRAUN-BLANQUET, J. 1955: Das Sedo-Scleranthion – neu für die Westalpen. – *Österr. Bot. Z.* **102**: 476–485.
- BRAUN-BLANQUET, J. 1963: Das Helianthemoglobularium, ein neuer Verband der baltischen Steppenvegetation. – *Veröff. Geobot. Inst. Eidgen. Techn. Hochsch. Stift. Rübél* **37**: 27–38.
- BRAUN-BLANQUET, J. & DE LEEUW, W. C. 1936: Vegetationsskizze von Ameland. – *Ned. Kruidk. Arch.* **46**: 359–393.
- BRAUN-BLANQUET, J. & TÜXEN, R. 1943: Übersicht der höheren Vegetationseinheiten Mitteleuropas (unter Ausschluss der Hochgebirge). – *Commun. Stn. Intern. Géobot. Méditerr. Alpine (Montpellier)* **84**: 1–11.
- BRAUN-BLANQUET, J.; GAJEWSKI, W.; WRABER, M. & WALAS, J. 1936: Classe des Rudereto-Secalinetales. Groupements messicoles, culturaux et nitrophiles-rudérales du cercle de végétation méditerranéen. – *Prodrome Groupements Vég. (Montpellier)* **3**: 1–37.
- BRAUN-BLANQUET, J.; ROUSSINE, N. & NÈGRE, R. 1952: Les Groupements Végétaux de la France Méditerranéenne: 1–297, 16 plates. – Montpellier.
- BRULLO, S. & MARCENÒ, C. 1985: Contributo alla conoscenza della vegetazione nitrofila della Sicilia. – In: J.-M. GÉHU (ed.), *Les végétations nitrophiles et anthropogènes (Baillieu 1983)* –

- Seminaire Les Megaphorbiaies (Bailleul 1984). – Colloq. Phytosociol. **12**: 23–148 (Ital., Engl. summary).
- COSTE, I. 1985: Contribution a l'étude de la classe *Agropyretea intermedii-repentis* OBERD. TH. MÜLL. et GÖRS 1967 dans le sud-ouest de la Roumanie. – In: J.-M. GÉHU (ed.), Les végétations nitrophiles et anthropogènes (Bailleul 1983). – Seminaire Les Megaphorbiaies (Bailleul 1984). – Colloq. Phytosociol. **12**: 577–589.
- DENGLER, J. 1994: Flora und Vegetation von Trockenrasen und verwandten Gesellschaften im Biosphärenreservat Schorfheide-Chorin. – *Gleditschia* **22**: 179–321.
- DENGLER, J. 1997: Gedanken zur synsystematischen Arbeitsweise und zur Gliederung der Ruderalgesellschaften (*Artemisietea vulgaris* s.l.). Mit der Beschreibung des *Elymo-Rubetum caesii* ass. nova. – *Tuexenia* **17**: 251–282, 4 tables.
- DENGLER, J. 2001a: Erstellung und Interpretation synchorologischer Karten am Beispiel der Klasse *Koelerio-Corynephoretea*. – *Ber. R.-Tüxen-Ges.* **13**: 223–228.
- DENGLER, J. 2001b: *Sisymbrietea*: 96–103. – In: C. BERG; J. DENGLER & A. ABDANK (eds.), Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung – Tabellenband. – Jena.
- DENGLER, J. 2001c: *Koelerio-Corynephoretea*: 118–136. – In: C. BERG; J. DENGLER & A. ABDANK (eds.), Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung – Tabellenband. – Jena.
- DENGLER, J. 2001d: *Artemisietea vulgaris*: 178–210. – In: C. BERG; J. DENGLER & A. ABDANK (eds.), Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung. – Tabellenband. – Jena.
- DENGLER, J. 2002 [2000]: Beiträge zur Nomenklatur einiger Ruderalgesellschaften. – In: E. RENNWALD (ed.), Verzeichnis und Rote Liste der Pflanzengesellschaften Deutschlands – mit Datenservice auf CD-ROM. – Schriftenr. Vegetationskd. **35**: 65–69.
- DENGLER, J. 2003: Entwicklung und Bewertung neuer Ansätze in der Pflanzensoziologie unter besonderer Berücksichtigung der Vegetationsklassifikation. – *Arch. Naturwiss. Diss.* **14**: 1–297 (with Engl. summary).
- DENGLER, J. in prep.: Die krautige Xerothermvegetation Nordostdeutschlands: Charakterisierung, Standortbedingungen, Syntaxonomie und Synchorologie im europäischen Kontext, Phyto-diversität sowie Naturschutzaspekte. – Univ. of Lüneburg, Faculty of Environmental Sciences, Postdoctoral thesis.
- DENGLER, J. & BERG, C. 2002 [2000]: Klassifikation und Benennung von Pflanzengesellschaften – Ansätze zu einer konsistenten Methodik im Rahmen des Projekts „Rote Liste der Pflanzengesellschaften von Mecklenburg-Vorpommern“. – In: E. RENNWALD (ed.), Verzeichnis und Rote Liste der Pflanzengesellschaften Deutschlands – mit Datenservice auf CD-ROM. – Schriftenr. Vegetationskd. **35**: 17–47.
- DENGLER, J. & KREBS, J. 2003: Drei neue Saumassoziationen der Klasse *Trifolio-Geranietea sanguinei* aus dem norddeutschen Tiefland. – *Drosera* **2003**: 11–32.
- DENGLER, J.; LÖBEL, S. & MICHL, T. 2001: Die Steinhöhe – ein ökologisches Kleinod in Lüneburg (Ergebnisse des vegetationskundlichen Studentenpraktikums im Sommersemester 1999). – *Jahrb. Naturwiss. Ver. Fürstentum Lüneburg* **42**: 143–188, 1 map, 1 table.
- DIEMONT, W. H.; SISSINGH, G. & WESTHOFF, V. 1940: Het dwergbiezen-verbond (*Nanocyperion flavescens*) in Nederland. – *Ned. Kruidk. Arch.* **50**: 215–284 (Dutch, French summary).
- DIERSCHKE, H. 1973: Neue Saumgesellschaften in Südniedersachsen und Nordhessen. – *Mitt. Florist.-Soziol. Arbeitsgem., N.F.* **15/16**: 66–85, 2 tables.
- DIERSCHKE, H. 1974: Saumgesellschaften im Vegetations- und Standortgefälle an Waldrändern. – *Scripta Geobot.* **6**: 1–246, 5 tables.
- DIERSCHKE, H. 1994: Pflanzensoziologie – Grundlagen und Methoden. – Stuttgart.
- DOING, H. 1963: Übersicht der floristischen Zusammensetzung, der Struktur und der dynamischen Beziehungen niederländischer Wald- und Gebüschgesellschaften. – *Meded. Landbouwhouwhoud. Wageningen* **63**(2): 1–60.
- DUVIGNEAUD, P. 1949: Classification phytosociologique des tourbières de l'Europe. – *Bull. Soc. Roy. Bot. Belg.* **81**: 58–129.
- EGGLER, J. 1933: Die Pflanzengesellschaften der Umgebung von Graz. – *Repert. Spec. Nov. Regni Veg., Beih.* **73**: 1–216.
- EISENBERG, M. 2003: Saumgesellschaften NO-Niedersachsens – Soziologie und Pflanzenartenvielfalt. – Univ. of Lüneburg, Inst. of Ecology and Environmental Chemistry, Diploma thesis.
- ELLMAUER, T. & MUCINA, L. 1993: *Molinio-Arrhenatheretea*: 297–401. – In: L. MUCINA; G. GRABHERR & T. ELLMAUER (eds.), Die Pflanzengesellschaften Österreichs. Teil I: Anthropogene Vegetation. – Jena.
- EWALD, J. 2001: Der Beitrag pflanzensoziologischer Datenbanken zur vegetationsökologischen Forschung. – *Ber. R.-Tüxen-Ges.* **13**: 53–69.
- FELFÖLDY, L. 1942: Soziologische Untersuchungen über die pannonische Ruderalvegetation. – *Acta Geobot. Hung.* **5**: 87–140 (Hungarian, German summary).

- FELFÖLDY, L. 1943: Vegetationsstudien auf der nördlichen Uferzone der Halbinsel Tihany. – Magy. Biol. Kutatóintézet Munkái **15**: 42–74 (Hungarian, German summary).
- FISCHER, A. 1982: Mosaik und Syndynamik der Pflanzengesellschaften von Lößböschungen im Kaiserstuhl (Südbaden). – Phytocoenologia **10**: 73–256, 2 plates, 2 tables.
- FOUCAULT, B. DE 1989: Synsystematique des prairies mesophiles d'Europe (ordre des Arrhenatheretalia elatioris). – Phytosociologie et pastoralisme (Paris 1988). – Colloq. Phytosociol. **16**: 695–708.
- FOUCAULT, B. DE; RAMEAU, J.-C. & ROYER, J.-M. 1983: Essai de synthèse syntaxonomique sur les groupements des Trifolio-Geranietea sanguinei MÜLLER 1961 en Europe centrale et occidentale. – J.-M. GÉHU (ed.): Les lisières forestières (Lille – 1979). – Colloq. Phytosociol. **8**: 445–462, 1 table.
- GAMS, H. 1927: Von den Follatères zur Dent de Morcles. – Beitr. Geobot. Landesaufn. **15**: 1–760, 1 map.
- GAUCKLER, K. 1957: Die Gipshügel in Franken, ihr Pflanzenkleid und ihre Tierwelt – Denkschrift zum 50jährigen Bestehen des Naturschutzgebietes der Naturhistorischen Gesellschaft Nürnberg. – Abh. Naturhist. Ges. Nürnberg **29**(1): 1–92.
- GÉHU, J.-M. 1961: Les groupements végétaux du bassin de la Sambre Française (Avesnois, Département du Nord, France) II. – Vegetatio **10**: 161–208.
- GÉHU, J.-M. & GÉHU-FRANCK, J. 1987: Schéma des végétations herbacées riveraines du Nord de la France. – Ser. Inform. Univ. La Laguna **22**: 313–320.
- GÉHU, J.-M.; RICHARD, J.-L. & TÜXEN, R. 1972: Compte-rendu de l'excursion de l'association internationale de phytosociologie dans le Jura en 1967. – Doc. Phytosociol. **2**: 1–44.
- GÖRS, S. 1966: Die Pflanzengesellschaften der Rebhänge am Spitzberg. – LANDESSTELLE FÜR NATURSCHUTZ UND LANDSCHAFTSPFLEGE BADEN-WÜRTTEMBERG (ed.): Der Spitzberg bei Tübingen. – Nat.-Landschaftsschutzgeb. Bad.-Württemberg. **3**: 476–534.
- GÖRS, S. 1968: Der Wandel der Vegetation im Naturschutzgebiet Schwenninger Moos unter dem Einfluß des Menschen in zwei Jahrhunderten. – In: LANDESSTELLE FÜR NATURSCHUTZ UND LANDSCHAFTSPFLEGE BADEN-WÜRTTEMBERG & STADT SCHWENNINGEN AM NECKAR (eds.): Das Schwenninger Moos – Der Neckarursprung. – Nat.-Landschaftsschutzgeb. Bad.-Württemberg. **5**: 190–284.
- GÖRS, S. 1975: Nitrophile Saumgesellschaften im Gebiet des Taubergießen. – In: LANDESSTELLE FÜR NATURSCHUTZ UND LANDSCHAFTSPFLEGE BADEN-WÜRTTEMBERG (ed.): Das Taubergießen-gebiet – eine Rheinauenlandschaft. – Nat.-Landschaftsschutzgeb. Bad.-Württemberg. **7**: 325–354.
- GÖRS, S. & MÜLLER, T. 1969: Beitrag zur Kenntnis der nitrophilen Saumgesellschaften Südwestdeutschlands. – Mitt. Florist.-Soziol. Arbeitsgem. N.F. **14**: 153–168, 1 table.
- GUTTE, P. 1966: Die Verbreitung einiger Ruderalpflanzengesellschaften in der weiteren Umgebung von Leipzig. – Wiss. Z. Univ. Halle **15**: 937–1010.
- GUTTE, P. & HILBIG, W. 1975: Übersicht über die Pflanzengesellschaften des südlichen Teiles der DDR – XI. Ruderalvegetation. – Hercynia N.F. **12**: 1–39.
- HALLBERG, H. P. 1971: Vegetation auf den Schalenablagerungen in Bohuslän, Schweden. – Acta Phytogeogr. Suec. (Uppsala) **56**: 1–136, appendix.
- HEJNÝ, S. 1978: Zur Charakteristik und Gliederung des Verbandes Sisymbrium TX., LOHMEYER et PREISING in TX. 1950. – Acta Bot. Slov. Acad. Sci. Slov., Ser. A, **3**: 265–270.
- HILBIG, W. 1972: Beitrag zur Kenntnis einiger wenig beachteter Pflanzengesellschaften Mitteldeutschlands. – Wiss. Z. Univ. Halle **21**: 83–98.
- HOCQUETTE, M. 1927: Étude sur la végétation et la flore du littoral de la mer du Nord de Nieuport à Sangatte. – Arch. Bot. (Caen) **1**(4): 1–179, 8 plates.
- HOHENESTER, A. 1960: Grasheiden und Föhrenwälder auf Diluvial- und Dolomitsanden im nördlichen Bayern. – Ber. Bayer. Bot. Ges. Erforsch. Heim. Flora **33**: 30–85.
- HOLUB, J.; HEJNÝ, S.; MORAVEC, J. & NEUHÄUSL, R. 1967: Übersicht der höheren Vegetationseinheiten der Tschechoslowakei. – Rozpr. Česk. Akad. Věd, Ráda Mat. Přír. Věd **77**(3): 1–75.
- HORVATÍČ, S. 1930: Soziologische Einheiten der Niederungswiesen in Kroatien und Slavonien. – Act. Bot. Inst. Bot. Univ. Zagreb **5**: 57–118.
- HORVATÍČ, S. 1958 [1956]: Geographisch-typologische Gliederung der Niederungswiesen und -weiden Kroatiens. – Angew. Pflanzensoziol. (Stolzenau) **15**: 63–73.
- HUECK, K. 1931: Erläuterung zur Vegetationskundlichen Karte des Endmoränengebiets von Chorin (Uckermark) (Meßtischblatt Hohenfinow). – Beitr. Naturdenkmalpflege **14**: 107–214.
- HÜLBUSCH, K. H. 1969: *Rumex obtusifolius* in einer neuen Flutrasen-Gesellschaft am Flußufer Nordwest- und Westdeutschlands. – Mitt. Florist.-Soziol. Arbeitsgem., N.F. **14**: 169–178, 1 table.
- HÜLBUSCH, K. H. 1973: Eine Trittgemeinschaft auf nordwestdeutschen Sandwegen. – Mitt. Florist.-Soziol. Arbeitsgem., N.F. **15/16**: 45–46, 1 table.

- HÜLBUSCH, K. H. & TÜXEN, R. 1968: *Corydalis claviculata-Epilobium angustifolium*-Ass. – Mitt. Florist.-Soziol. Arbeitsgem. N.F. **13**: 224, 1 table.
- HÜPPE, J. & HOFMEISTER, H. 1990: Syntaxonomische Fassung und Überblick über die Ackerunkrautgesellschaften der Bundesrepublik Deutschland. – Ber. R.-Tüxen-Ges. **2**: 61–81, 2 tables.
- ISERMANN, M. 1997: Vegetations- und standortskundliche Untersuchungen in Küstendünen Vorpommerns. – E.-M.-Arndt-Univ. Greifswald, PhD thesis.
- ISERMANN, M. & DENGLER, J. in prep.: Syntaxonomical aspects of the Cakiletea maritimae and the Ammophiletea with special consideration of the German coast.
- JANSEN, F. & PÄZOLT, J. 2001: *Molinio-Arrhenatheretea*: 144–156. – In: C. BERG; J. DENGLER & A. ABDANK (eds.), Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung – Tabellenband. – Jena.
- JECKEL, G. 1984: Syntaxonomische Gliederung, Verbreitung und Lebensbedingungen nordwestdeutscher Sandtrockenrasen (Sedo-Scleranthetea). – Phytocoenologia **12**: 9–153.
- JOUANNE, P. & CHOUARD, P. 1929: Essai de géographie botanique sur les forêts de l'Aisne. – Bull. Soc. Bot. Fr. **74**: 972–979.
- JULVE, P. 1993: Synopsis phytosociologique de la France (communautés de plantes vasculaires). – Lejeunia, N.S. **140**: 1–160.
- JURASZEK, H. 1927: Pflanzensoziologische Studien über die Dünen bei Warschau. – Bull. Acad. Pol. Sci. Lett., Cl. Sci. Math. Nat., Sér. B **1927**: 515–610.
- KAISER, D. 1926: Die Pflanzenwelt des Hennebergisch-Fränkischen Muschelkalkgebietes – Eine pflanzensoziologische Monographie. – Repert. Spec. Nov. Regni Veg., Beih. **44**: 1–280, 1 map.
- KIENAST, D. 1978: Die spontane Vegetation der Stadt Kassel in Abhängigkeit von bau- und stadtstrukturellen Quartierstypen. – Urbs Regio **10**: 1–414, 8 tables, 2 maps.
- KIESSLICH, M.; DENGLER, J. & BERG, C. 2003: Die Gesellschaften der Bidentetea tripartitae TX. et al. ex VON ROCHOW 1951 in Mecklenburg-Vorpommern mit Anmerkungen zur Synsystematik und Nomenklatur der Klasse. – Feddes Repert. **114**: 91–139.
- KLAUCK, E.-J. 1992: *Hieracium murorum* L. in helio-thermophil-azidoklinen Säumen und Staudenfluren. – Tuexenia **12**: 147–173.
- KLIKA, J. 1931a: Die Pflanzengesellschaften und ihre Sukzession auf den entblößten Sandböden in dem mittleren Elbetale. – Sb. Česk. Akad. Zemed. **89**: 277–302 (Czech, German summary).
- KLIKA, J. 1931b: Studien über die xerotherme Vegetation Mitteleuropas – I. Die Pollauer Berge im südlichen Mähren. – Bot. Cbl., 2. Abt., Beih. **47**: 343–398.
- KLIKA, J. 1934: Studien über die xerotherme Vegetation Mitteleuropas. – III. Die Pflanzengesellschaften auf Sandböden des Marchfeldes in der Slowakei. – Bot. Cbl., Abt. B, Beih. **52**: 1–16.
- KLIKA, J. & HADAČ, E. 1944a: Rostlinná společenstva střední Evropy. – Příroda **36**: 249–259 (in Czech).
- KLIKA, J. & HADAČ, E. 1944b: Rostlinná společenstva střední Evropy. (Dokončení). – Příroda **36**: 281–295 (in Czech).
- KLIKA, J. & NOVÁK, J. 1941 (eds.): Praktikum rostlinné sociologie, půdoznalství, klimatologie a ekologie. – Praha (in Czech).
- KNAPP, H. D. & VOIGTLÄNDER, U. 1983: Die Pflanzenwelt des NSG „Ostufer der Feisneck“ bei Waren. – Nat. Naturschutz Mecklenburg **19**: 49–80.
- KNAPP, R. 1942: Die Systematik der Wälder, Zwergstrauchheiden und Trockenrasen des eurosibirischen Vegetationskreises. – Beil. Rundbr. Zentralstelle Vegetationskartierung Reiches Kameraden Felde **12**: 1–84, 35 maps, manuscript, Halle (Saale).
- KNAPP, R. 1944: Vegetationsaufnahmen von Trockenrasen und Felsfluren Mitteldeutschlands – Teil 1 – Säureliebende Sand- und Felsfluren (Corynephoretalia). – Manuscript, Halle (Saale).
- KNAPP, R. 1948: Einführung in die Pflanzensoziologie II – Die Pflanzengesellschaften Mitteleuropas. – Ludwigsburg.
- KNAPP, R. 1961: Vegetations-Einheiten der Wegränder und der Eisenbahn-Anlagen in Hessen und im Bereich des unteren Neckar. – Ber. Oberhess. Ges. Nat.-Heilkd. **31**: 122–154.
- KOBENDZA, R. 1930: Les Rapports Phytosociologiques dans l'ancienne grand Forêt de Kampinos. – Planta Pol. **2**: 1–200, 19 tables, 13 plates (Polish, French summary).
- KOCH, W. 1926: Die Vegetationseinheiten der Linthebene unter Berücksichtigung der Verhältnisse in der Nordostschweiz. – St. Gallen.
- KOPECKÝ, K. 1969: Zur Syntaxonomie der natürlichen Saumgesellschaften in der Tschechoslowakei und zur Gliederung der Klasse Galio-Urticetea. – Folia Geobot. Phytotaxon. **4**: 235–359.
- KOPERSKI, M.; SAUER, M.; BRAUN, W. & GRADSTEIN, S. R. 2000: Referenzliste der Moose Deutschlands. – Schriftenr. Vegetationskd. **34**: 1–519.

- KORNECK, D. 1974: Xerothermvegetation von Rheinland-Pfalz und Nachbargebieten. – Schriftenr. Vegetationskd. 7: 1–196, 158 tables.
- KRAHULEC, F.; ROSÉN, E. & VAN DER MAAREL, E. 1986: Preliminary classification and ecology of dry grassland communities on Ölands Stora Alvar (Sweden). – Nord. J. Bot. 6: 797–809.
- KRATZERT, G. & DENGLER, J. 1999: Die Trockenrasen der „Gabower Hänge“ am Oderbruch. – Verh. Bot. Ver. Berlin Brandenburg 132: 285–329, 10 tables, 1 map.
- KRAUSCH, H.-D. 1961: Die kontinentalen Steppenrasen (Festucetalia valesiaceae) in Brandenburg. – Feddes Repert., Beih. 139: 167–227.
- KRAUSCH, H.-D. 1967: Die Pflanzengesellschaften des Stechlinsee-Gebietes – 3. Grünlandgesellschaften und Sandtrockenrasen. – Limnologica 5: 331–366.
- KREH, W. 1935: Pflanzensoziologische Untersuchungen auf Stuttgarter Auffüllplätzen. – Jahresh. Ver. Vaterl. Naturkd. Württemberg 51: 59–120, plates 7–11.
- KRISCH, H. 1974: zur Kenntnis der Pflanzengesellschaften der mecklenburgischen Boddenküste. – Feddes Repert. 85: 115–158.
- KRUSEMAN, G. & VLIENER, J. 1939: Akkerassociaties in Nederland. – Ned. Kruidk. Arch. 49: 327–398.
- KUHN, K. 1937: Die Pflanzengesellschaften im Neckargebiet der Schwäbischen Alb. – Öhringen.
- LANGE, D. 1998: *Festuca* L. 1753: 369–437. – In: O. SEBALD; S. SEYBOLD; G. PHILIPPI & A. WÖRZ (eds.), Die Farn- und Blütenpflanzen Baden-Württembergs – Band 7: Spezieller Teil (Spermatophyta, Unterklassen Alismatidae, Liliidae Teil 1, Commelinidae Teil 1) – Butomaceae bis Poaceae. – Stuttgart.
- LEBRUN, J.; NOIRFALISE, A.; HEINEMANN, P. & VANDEN BERGHEN, C. 1949: Les associations végétales de Belgique. – Bull. Soc. Roy. Bot. Belg. 82: 105–207.
- LIBBERT, W. 1931: Die Pflanzengesellschaften im Ueberschwemmungsgebiet der unteren Warthe in ihrer Abhängigkeit vom Wasserstande. – Jahrb. Naturwiss. Ver. Neumark 3: 25–40.
- LIBBERT, W. 1932: Die Vegetationseinheiten der neumärkischen Staubeckenlandschaft unter Berücksichtigung der angrenzenden Landschaften – 1. Teil. – Verh. Bot. Ver. Prov. Brandenburg 74: 10–93.
- LIBBERT, W. 1933: Die Vegetationseinheiten der neumärkischen Staubeckenlandschaft unter Berücksichtigung angrenzender Landschaften – 2. Teil. – Verh. Bot. Ver. Prov. Brandenburg 75: 230–348.
- LIBBERT, W. 1940: Die Pflanzengesellschaften der Halbinsel Darß (Vorpommern). – Repert. Specierum Nov. Regni Veg., Beih. 114: 1–95, 16 plates.
- LINKE, C. 2003: Der Schwarzholunder – Ruderalgebüsch (*Lamio albae* – *Sambucetum nigrae* ass. nov.) – eine ruderale Gebüschgesellschaft. – Bot. Rundbriefe Mecklenb.-Vorpom. 38 (in press).
- LÖBEL, S. 2002: Trockenrasen auf Öland: Syntaxonomie – Ökologie – Biodiversität. – Univ. of Lüneburg, Inst. Ecology and Environmental Chemistry, Diploma thesis.
- MAHN, E.-G. 1965: Vegetationsaufbau und Standortverhältnisse der kontinental beeinflussten Xerothermrasengesellschaften Mitteldeutschlands. – Abh. Sächs. Akad. Wiss. Leipzig, Math.-Naturw. Kl. 49(1): 1–138, 8 plates.
- MALATO-BELIZ, J.; TÜXEN, J. & TÜXEN, R. 1960: Zur Systematik der Unkrautgesellschaften der west- und mitteleuropäischen Wintergetreidefelder. – Mitt. Florist.-Soziol. Arbeitsgem., N.F. 8: 145–147.
- MALCUIT, G. 1929: Contributions a l'étude phytosociologique des Vosges Méridionales Saônoises – Les associations végétales de la vallée de la Lanterne. – Arch. Bot. Mém. 2(6): 1–211, 8 plates.
- MANTHEY, M. 2001: Stellarietea mediae: 104–110. – In: C. BERG; J. DENGLER & A. ABDANK (eds.), Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung. – Tabellenband. – Jena.
- MANTHEY, M. 2003: Vegetationsökologie der Äcker und Ackerbrachen Mecklenburg-Vorpommerns. – Diss. Bot. 373: I–VIII + 1–209, CD-Rom, Berlin.
- MORAVEC, J. 1967: Zu den azidophilen Trockenrasengesellschaften Südwestböhmens und Bemerkungen zur Syntaxonomie der Klasse Sedo-Scleranthetea. – Folia Geobot. Phytotaxon. 2: 137–178.
- MUCINA, L. 1978a: *Erigeron-Lactucetum serriolae* LOHM. 1950 apud OBERD. 1957 auf Ruderalstandorten der Stadt Piešťany. – Acta Bot. Slov. Acad. Sci. Slov., Ser. A 3: 319–338.
- MUCINA, L. 1978b: Ruderal communities with the dominant species *Lactuca serriola*. – Biológia 33: 809–819.
- MUCINA, L. 1993a: Nomenklatorische und syntaxonomische Definitionen, Konzepte und Methoden: 19–21. – In: L. MUCINA; G. GRABHERR & T. ELLMAUER (eds.), Die Pflanzengesellschaften Österreichs. Teil I: Anthropogene Vegetation. – Jena.
- MUCINA, L. 1993b: Stellarietea mediae: 110–168. – In: L. MUCINA; G. GRABHERR & T. ELLMAUER (eds.), Die Pflanzengesellschaften Österreichs. Teil I: Anthropogene Vegetation. – Jena.

- MUCINA, L. 1993 c: *Artemisietea vulgaris*: 169–202. – In: L. MUCINA; G. GRABHERR & T. ELLMAUER (eds.), *Die Pflanzengesellschaften Österreichs. Teil I: Anthropogene Vegetation.* – Jena.
- MUCINA, L. 1993 d: *Galio-Urticetea*: 203–251. – In: L. MUCINA; G. GRABHERR & T. ELLMAUER (eds.), *Die Pflanzengesellschaften Österreichs. Teil I: Anthropogene Vegetation.* – Jena.
- MUCINA, L. 1997: *Conspectus of Classes of European Vegetation.* – *Folia Geobot. Phytotaxon.* **32**: 117–172.
- MUCINA, L. & KOLBEK, J. 1993 a: *Trifolio-Geranietea sanguinei.* – In: L. MUCINA; G. GRABHERR & T. ELLMAUER (eds.), *Die Pflanzengesellschaften Österreichs. Teil I: Anthropogene Vegetation.* – Jena.
- MUCINA, L. & KOLBEK, J. 1993 b: *Festuco-Brometea*: 420–492. – In: L. MUCINA; G. GRABHERR & T. ELLMAUER (eds.), *Die Pflanzengesellschaften Österreichs. Teil I: Anthropogene Vegetation.* – Jena.
- MÜLLER, T. 1961: *Ergebnisse pflanzensoziologischer Untersuchungen in Südwestdeutschland.* – *Beitr. Naturkd. Forsch. Südwestdschl.* **20**: 111–122.
- MÜLLER, T. 1962: *Die Saumgesellschaften der Klasse Trifolio-Geranietea sanguinei.* – *Mitt. Florist.-Soziol. Arbeitsgem., N.F.* **9**: 95–140.
- MÜLLER, T. 1966: *Die Wald-, Gebüsch-, Saum- und Halbtrockenrasengesellschaften des Spitzbergs.* – In: LANDESSTELLE FÜR NATURSCHUTZ UND LANDSCHAFTSPFLEGE BADEN-WÜRTTEMBERG (ed.), *Der Spitzberg bei Tübingen.* – *Nat.-Landschaftsschutzgeb. Bad.-Württemb.* **3**: 278–475, Ludwigsburg.
- MÜLLER, T. 1983 a: *Klasse: Artemisietea vulgaris LOHM., PRSG. et TX. in TX. 50 – Eurosibirische nitrophytische Uferstauden- und Saumgesellschaften sowie ruderale Beifuß- und Distelgesellschaften*: 135–277. – In: E. OBERDORFER (ed.), *Süddeutsche Pflanzengesellschaften – Teil III: Wirtschaftswiesen und Unkrautgesellschaften*, 2nd ed. – Stuttgart.
- MÜLLER, T. 1983 b: *Klasse: Agropyretea intermedii-repentis (OBERD. et al. 67) MÜLLER et GÖRS 69 – Halbruderale Pionier-Trockenrasen*: 278–299. – In: E. OBERDORFER (ed.), *Süddeutsche Pflanzengesellschaften – Teil III: Wirtschaftswiesen und Unkrautgesellschaften*, 2nd ed. – Stuttgart.
- MÜLLER, T. & GÖRS, S. 1969: *Halbruderale Trocken- und Halbtrockenrasen.* – *Vegetatio* **18**: 203–221.
- NORDHAGEN, R. 1940: *Studien über die maritime Vegetation Norwegens – I. Die Pflanzenwelt der Tangwälle.* – *Bergens Mus. Årbok, Naturvitensk. Rekke* **1939/40** (2): 1–123, 18 plates, 2 tables.
- OBERDORFER, E. 1949: *Die Pflanzengesellschaften der Wutachschlucht.* – *Beitr. Naturkd. Forsch. Südwestdschl.* **8**: 22–60.
- OBERDORFER, E. 1954: *Über Unkrautgesellschaften der Balkanhalbinsel.* – *Vegetatio* **4**: 379–411.
- OBERDORFER, E. 1957: *Süddeutsche Pflanzengesellschaften.* – *Pflanzensoziologie* **10**: 1–564.
- OBERDORFER, E. & KORNECK, D. 1978: *Klasse: Festuco-Brometea BR.-BL. et TX. 43 – Trocken- und Steppenrasen, Halbtrockenrasen, basiphile Magerrasen der planaren bis hochmontanen Höhenstufe*: 86–180. – In: E. OBERDORFER (ed.), *Süddeutsche Pflanzengesellschaften – Teil II: Sand- und Trockenrasen, Heide- und Borstgrasgesellschaften, alpine Magerrasen, Saumgesellschaften, Schlag- und Hochstaudenfluren*, 2nd ed. – Stuttgart.
- OBERDORFER, E.; GÖRS, S.; KORNECK, D.; LOHMEYER, W.; MÜLLER, T.; PHILIPPI, G. & SEIBERT, P. 1967: *Systematische Übersicht der westdeutschen Phanerogamen- und Gefäßkryptogamengesellschaften.* – *Schriftenr. Vegetationskd.* **2**: 7–62.
- PASSARGE, H. 1957 a: *Über Kahlschlaggesellschaften im baltischen Buchenwald von Dargun (Ost-Mecklenburg).* – *Phyton* **7**: 142–151
- PASSARGE, H. 1957 b: *Zur soziologischen Stellung einiger bahnbegleitender Neophyten in der Mark Brandenburg.* – *Mitt. Florist.-Soziol. Arbeitsgem., N.F.* **6/7**: 155–163.
- PASSARGE, H. 1959: *Pflanzengesellschaften zwischen Trebel, Grenz-Bach und Peene (O-Mecklenburg).* – In: W. ROTHMALER & A. SCAMONI (eds.), *Beiträge zur Vegetationskunde – Band III.* – *Feddes Repert., Beih.* **138**: 1–56, plates 1–2.
- PASSARGE, H. 1960: *Zur soziologischen Gliederung binnenländischer *Corynephorus*-Rasen im nordostdeutschen Flachland.* – *Verh. Bot. Ver. Prov. Brandenburg* **98–100**: 113–124.
- PASSARGE, H. 1964: *Pflanzengesellschaften des nordostdeutschen Flachlandes I.* – *Pflanzensoziologie* **13**: 1–324.
- PASSARGE, H. 1967: *Über Saumgesellschaften im nordostdeutschen Flachland.* – *Feddes Repert.* **74**: 145–158.
- PASSARGE, H. 1975: *Über Wiesensaumgesellschaften.* – *Feddes Repert.* **86**: 599–617.
- PASSARGE, H. 1978 a: *Übersicht über mitteleuropäische Gefäßpflanzengesellschaften.* – *Feddes Repert.* **89**: 133–195.
- PASSARGE, H. 1978 b: *Bemerkenswerte Pflanzengesellschaften auf märkischem Gebiet.* – *Gleditschia* **6**: 193–208.
- PASSARGE, H. 1979: *Über azidophile Waldsaumgesellschaften.* – *Feddes Repert.* **90**: 465–479.

- PASSARGE, H. 1988: Neophyten-reiche märkische Bahnbegleitgesellschaften. – *Gleditschia* **16**: 187–197.
- PASSARGE, H. 1989: Agropyretea-Gesellschaften im nördlichen Binnenland. – *Tuexenia* **9**: 121–150.
- PASSARGE, H. 1993: Lianenschleier-, fluviale und ruderal Staudengesellschaften in den planaren Elb- und Oderauen. – *Tuexenia* **13**: 343–371.
- PASSARGE, H. 1996: Pflanzengesellschaften Nordostdeutschlands – I. Hydro- und Therophytosa. – Berlin.
- PASSARGE, H. 2002: Pflanzengesellschaften Nordostdeutschlands 3 – III. Cespitosa und Herbosa. – Berlin.
- PETIT, D. 1978: Les pelouses à *Hieracium pilosella* L. des terrils du Nord de la France. – In: J.-M. GÉHU (ed.), *La végétation des pelouses sèches à thérophytes* (Lille 1977). – *Colloq. Phytosociol.* **6**: 201–212.
- PHILIPPI, G. 1971: Zur Kenntnis einiger Ruderalgesellschaften der nordbadischen Flugsandgebiete um Mannheim und Schwetzingen. – *Beitr. Naturkd. Forsch. Südwestdschl.* **2**: 113–131.
- PHILIPPI, G. 1973: Sandfluren und Brachen kalkarmer Flugsande des mittleren Oberrheingebietes. – *Veröff. Landesstelle Naturschutz Landschaftspflege Bad.-Württemb.* **41**: 24–62.
- PÖTSCH, J. 1962: Die Grünlandgesellschaften des Finer Bruchs in West-Brandenburg. – *Wiss. Z. Pädagog. Hochsch. Potsdam, Math.-Naturwiss. R.* **7**: 167–200.
- POP, I. 1968: Aufzählung der Rasengesellschaften aus den Kalkmassiven der rumänischen Karpaten. – *Contrib. Bot.* **1968**: 267–275 (Romanian, German summary).
- POTT, R. 1995: Die Pflanzengesellschaften Deutschlands, 2nd ed. – Stuttgart.
- PREISING, E.; VAHLE, H.-C.; BRANDES, D.; HOFMEISTER, H.; TÜXEN, J. & WEBER, H. E. 1995: Die Pflanzengesellschaften Niedersachsens – Bestandsentwicklung, Gefährdung und Schutzprobleme – Einjährige ruderaler Pionier-, Tritt- und Ackerwildkrautgesellschaften. – *Naturschutz Landschaftspflege Niedersachsen* **20**(6): 1–94.
- QUANTIN, A. 1935: L'Evolution de la Végétation à l'Etage de la Chênaie dans le Jura Méridional. – *Commun. Stn. Intern. Géobot. Méditerr. Alpine* **37**: 1–328, 8 plates, 1 map.
- REDECKER, B. 2001: Schutzwürdigkeit und Schutzperspektive der Stromtal-Wiesen an der unteren Mittelalbe – Ein vegetationskundlicher Beitrag zur Leitbildentwicklung. – *Arch. Naturwiss. Diss.* **13**: 1–164, appendix, 2 maps.
- REGEL, C. 1925: Über litauische Wiesen I. – *Veröff. Geobot. Inst. Rübel Zürich* **3**: 320–334.
- REGEL, C. 1928: Zur Klassifikation der Assoziationen der Sandböden. – *Bot. Jahrb. Syst. Pflanzengesch. Pflanzengeogr.* **61**: 263–284.
- RENNWALD, E. 2002 [„2000“] (ed.): *Verzeichnis und Rote Liste der Pflanzengesellschaften Deutschlands – mit Datenservice auf CD-ROM.* – *Schriftenr. Vegetationskd.* **35**: 1–800.
- RIVAS GODAY, S. 1964: *Vegetación y flórua de la cuenca extremeña del Guadiana.* – Madrid.
- RIVAS GODAY, S. & BORJA CARBONELL, J. 1961: *Estudio de Vegetación y Flórua, del Macizo de Gúdar y Jabalambre.* – *An. Inst. Bot. A. J. Cavanilles (Madrid)* **19**: 1–550.
- RIVAS GODAY, S. & RIVAS-MARTÍNEZ, S. 1963: *Estudio y clasificación de los pastizales españoles.* – Madrid.
- RIVAS-MARTÍNEZ, S. 2002: High syntaxa of Spain and Portugal and their characteristic species. – In: S. RIVAS-MARTÍNEZ; T. E. DÍAZ; F. FERNÁNDEZ-GONZÁLEZ; J. IZCO, J. LOIDI, J.; M. LOUSÁ & A. PENAS (eds.), *Vascular plant communities of Spain and Portugal. Addenda to the syntaxonomical checklist of 2001.* – *Itinera Geobot.* **15**: 434–696.
- RIVAS-MARTÍNEZ, S. & CANTÓ, P. 1987: Datos sobre la vegetación de las Sierras de Guadarrama y Malagón. – *Lazaroa* **7**: 235–257.
- RIVAS-MARTÍNEZ, S. & COSTA, M. 1998: Datos sobre la vegetación y el bioclima del Valle de Arán. – *Acta Bot. Barcelona* **45**: 473–499.
- RIVAS-MARTÍNEZ, S. & IZCO, J. 1977: Sobre la vegetación terofítica subnitrófila mediterránea. – *An. Inst. Bot. A. J. Cavanilles* **34**: 355–381.
- RIVAS-MARTÍNEZ, S.; DÍAZ GONZALEZ, T. E.; PRIETO, J. A. F.; LOIDI, J. & PENAS, A. 1984: *La Vegetación de la Alta Montaña Cantábrica – Los Picos de Europa.* – *Gral.*
- RIVAS-MARTÍNEZ, S.; BÁSCONES, J. C.; DÍAZ, T. E.; FERNÁNDEZ-GONZÁLEZ, F. & LOIDI, J. 1991: *Vegetación del Pirineo occidental y Navarra.* – *Itinera Geobot.* **5**: 5–456.
- RIVAS-MARTÍNEZ, S.; DÍAZ, T. E.; FERNÁNDEZ-GONZÁLEZ, F.; IZCO, J.; LOIDI, J.; LOUSÁ, M. & PENAS, A. 2002 (eds.): *Vascular plant communities of Spain and Portugal. Addenda to the syntaxonomical checklist of 2001.* – *Itinera Geobot.* **15**: 1–922.
- ROCHOW, M. VON 1951: *Die Pflanzengesellschaften des Kaiserstuhls.* – *Pflanzensoziologie* **8**: 1–140, 6 plates, 1 map.
- ROSTAŃSKI, K. & GUTTE, P. 1971: *Ruderalvegetation von Wrocław.* – *Mat. Zakładu Fitosoc. Stosowanej Univ. Warsz.* **27**: 167–215 (Polish, German summary).
- ROYER, J.-M. 1991: *Synthèse eurosibérienne, phytosociologique et phytogéographique de la classe des Festuco-Brometea.* – *Diss. Bot.* **178**: 1–296, 8 tables.
- SCHAMINÉE, J. H. J.; STORTELDER, A. H. F. & WEEDA, E. J. 1996 (eds.): *De Vegetatie van*

- Nederland – Deel 3. Plantengemeenschappen van graslanden, zomen en droge heiden. – Uppsala (Dutch).
- SCHOLZ, P. 2000: Katalog der Flechten und flechtenbewohnenden Pilze Deutschlands. – Schriftenr. Vegetationskd. **31**: 1–298.
- SCHREIER, K. 1955: Die Vegetation auf Trümmer-Schutt zerstörter Stadtteile in Darmstadt und ihre Entwicklung in pflanzensoziologischer Betrachtung. – Schriftenr. Naturschutzstelle Darmstadt **3**(1): 1–50.
- SCHUBERT, R.; HILBIG, W. & KLOTZ, S. 2001: Bestimmungsbuch der Pflanzengesellschaften Deutschlands. – Heidelberg.
- SCHWICKERATH, M. 1944: Das Hohe Venn und seine Randgebiete – Vegetation, Böden und Landschaft. – Pflanzensoziologie **6**: 1–278.
- SEYBOLD, S. & MÜLLER, T. 1972: Beiträge zur Kenntnis der Schwarznessel (*Ballota nigra* agg.) und ihrer Vergesellschaftung. – Veröff. Landesstelle Naturschutz Landschaftspflege Bad.-Württemberg. **40**: 51–126.
- SISSINGH, G. 1950: Onkruid-associaties in Nederland – Een sociologisch-systematische beschrijving van de klasse Rudereto-Secalinetea BR.-BL. 1936. – Versl. Landbouwk. Onderz. **56**(15): 1–224, 11 plates, 11 tables (Dutch, French summary).
- SISSINGH, G. 1969: Über die systematische Gliederung von Trittpflanzen-Gesellschaften. – Mitt. Florist.-Soziol. Arbeitsgem., N.F. **14**: 179–192, 2 tables.
- SISSINGH, G. 1974: Comparaison du Roso-Ephedretum de Bretagne avec des unités des végétation analogues (Contribution à la systématique des associations de dunes grises atlantiques et méditerranéennes). – Doc. Phytosociol. **7–8**: 95–106, 4 tables.
- SLAVNIĆ, Ž. 1951: Prodrôme des groupements végétaux nitrophiles de la Voïvodine (Yougoslavie). – Zb. Matice Srpske, Ser. Prir. Nauka **1**: 84–169 (Serbo-Croatian, French summary).
- SOMMER, W.-H. 1971: Wald- und Ersatzgesellschaften im östlichen Niedersachsen. – Diss. Bot. **12**: 1–101, 18 tables.
- SOÓ, R. 1957: Conspectus des groupements végétaux dans les bassins carpathiques – II. Les associations psammophiles et leur génétique. – Acta Bot. Acad. Sci. Hung. **3**: 43–64, 5 tables.
- SOÓ, R. DE 1929: Die Vegetation und die Entstehung der ungarischen Puszta. – J. Ecol. **17**: 329–350.
- STEFFEN, H. 1931: Vegetationskunde von Ostpreußen. – Pflanzensoziologie **1**: 1–406.
- SUKOPP, H. 1971: Beiträge zur Ökologie von *Chenopodium botrys* L. – I. Verbreitung und Vergesellschaftung. – Verh. Bot. Ver. Prov. Brandenburg **108**: 8–25.
- THEURILLAT, J.-P. & MORAVEC, J. 1991: Index of Names of Syntaxa Published in 1988. – Folia Geobot. Phytotaxon. **26**: 197–212.
- THEURILLAT, J.-P. & MORAVEC, J. 1998: Index of Names of Syntaxa Typified in 1994. – Folia Geobot. Phytotaxon. **33**: 475–480.
- TÜXEN, J. 1955: Über einige vikariierende Assoziationen aus der Gruppe der Fumarieten. – Mitt. Florist.-Soziol. Arbeitsgem. N.F. **5**: 84–89.
- TÜXEN, R. 1928: Vegetationsstudien im nordwestdeutschen Flachlande – I. Ueber die Vegetation der nordwestdeutschen Binnendünen. – Jahrb. Geogr. Ges. Hannover **1928**: 71–93.
- TÜXEN, R. 1931: Die Pflanzendecke zwischen Hildesheimer Wald und Ith in ihren Beziehungen zu Klima, Boden und Mensch: 55–131. – In: W. BARNER (ed.), Unsere Heimat – Das Land zwischen Hildesheimer Wald und Ith, Erster Band. – Hildesheim.
- TÜXEN, R. 1937: Die Pflanzengesellschaften Nordwestdeutschlands. – Mitt. Florist.-Soziol. Arbeitsgem. Niedersachsen **3**: 1–170.
- TÜXEN, R. 1947: Der Pflanzensoziologische Garten in Hannover und seine bisherige Entwicklung. – Jahresber. Naturhist. Ges. Hannover **94–98**: 113–288.
- TÜXEN, R. 1950: Grundriß einer Systematik der nitrophilen Unkrautgesellschaften in der Euro-sibirischen Region Europas. – Mitt. Florist.-Soziol. Arbeitsgem. N.F. **2**: 94–175.
- TÜXEN, R. 1951: Eindrücke während der pflanzengeographischen Exkursionen durch Süd-Schweden. – Vegetatio **3**: 149–172.
- TÜXEN, R. 1962: Pflanzensoziologisch-systematische Überlegungen zu Jakucs, P.: Die phytosoziologischen Verhältnisse der Flaumeichen-Buschwälder Südostmitteleuropas. – Mitt. Florist.-Soziol. Arbeitsgem., N.F. **9**: 296–300.
- TÜXEN, R. 1967: Ausdauernde nitrophile Saumgesellschaften Mitteleuropas. – Contrib. Bot. **1967**: 431–453.
- TÜXEN, R. 1976: Plantaginetea maioris – Agropyreteae: 1–211. – In: R. TÜXEN (ed.), Bibliographia Phytosociologica Syntaxonomica **28**. – Vaduz.
- TÜXEN, R. & BRUN-HOOL, J. 1975: *Impatiens noli-tangere*-Verlichtungsgesellschaften. – Mitt. Florist.-Soziol. Arbeitsgem., N.F. **18**: 133–155, 3 tables.
- TUTIN, T. G.; HEYWOOD, V. H.; BURGESS, N. A.; MOORE, D. M.; VALENTINE, D. H.; WALTERS, S. M. & WEBB, D. A. 1968 (eds.): Flora Europaea – Vol. 2: Rosaceae to Umbelliferae. – Cambridge.
- TUTIN, T. G.; HEYWOOD, V. H.; BURGESS, N. A.; VALENTINE, D. H.; WALTERS, S. M. & WEBB,

- D. A. 1972 (eds.): *Flora Europaea* – Vol. 3: *Diapensiaceae* to *Myoporaceae*. – Cambridge.
- TUTIN, T. G.; HEYWOOD, V. H.; BURGESS, N. A.; VALENTINE, D. H.; WALTERS, S. M. & WEBB, D. A. 1976 (eds.): *Flora Europaea* – Vol. 4: *Plantaginaceae* to *Compositae* (and *Rubiaceae*). – Cambridge.
- TUTIN, T. G.; HEYWOOD, V. H.; BURGESS, N. A.; VALENTINE, D. H.; WALTERS, S. M. & WEBB, D. A. 1980 (eds.): *Flora Europaea* – Vol. 5: *Alismataceae* to *Orchidaceae* (*Monocotyledones*). – Cambridge.
- TUTIN, T. G.; BURGESS, N. A.; CHATER, A. O.; EDMONDSON, J. R.; HEYWOOD, V. H.; MOORE, D. M.; VALENTINE, D. H.; WALTERS, S. M. & WEBB, D. A. 1993 (eds.): *Flora Europaea* – Vol. 1: *Psilotaceae* to *Platanaceae*, 2nd ed. – Cambridge.
- VAN GILS, H.; KEYSERS, E. & LAUNSPACH, W. 1975: *Saumgesellschaften im klimazonalen Bereich des Ostro-Carpinium orientalis*. – *Vegetatio* **31**: 47–64.
- VICHEREK, J. 1972: Die Sandpflanzengesellschaften des unteren und mittleren Dnjeprstromgebietes (die Ukraine). – *Folia Geobot. Phytotaxon.* **7**: 9–46, 4 tables.
- VLIEGER, J. 1937: *Aperçu sur les unites phytosociologiques supérieures des Pays-Bas*. – *Nederl. Kruidk. Arch.* **47**: 335–353.
- VOLK, H. O. 1931: Beiträge zur Ökologie der Sandvegetation der oberrheinischen Tiefebene. – *Z. Bot.* **24**: 81–185.
- WALTHER, K. 1977: Die Vegetation des Elbtales – Die Flußniederung von Elbe und Seege bei Gartow (Kr. Lüchow-Dannenberg). – *Abh. Verh. Naturwiss. Ver. Hamburg, N.F. Suppl.* **20**: 1–123, 3 maps.
- WEBER, H. E. 2001: Internationaler Code der Pflanzensoziologischen Nomenklatur (ICPN) – 3. Aufl. (H. E. WEBER, J. MORAVEC, J. P. THEURILLAT) – Deutsche Version. – In: H. DIERSCHKE (ed.): *Synopsis der Pflanzengesellschaften Deutschlands*, Sonderh. **1**: 1–61.
- WEBER, H. E. 2003: Anleitung zur Revision und gültigen Veröffentlichung syntaxonomischer Namen bis zur Rangstufe der Assoziation. – *Tuexenia* **23**: 401–417.
- WEBER, H. E.; MORAVEC, J. & THEURILLAT, J.-P. 2000: *International Code of Phytosociological Nomenclature*, 3rd ed. – *J. Veg. Sci.* **11**: 739–768.
- WEEDA, E. J.; DOING, H. & SCHAMINÉE, J. H. J. 1996: *Koelerio-Corynephorete*: 61–144. – In: J. H. J. SCHAMINÉE; A. H. F. STORTELDER & E. J. WEEDA (eds.), *De Vegetatie van Nederland – Deel 3. Plantengemeenschappen van graslanden, zomen en droge heiden*. – Uppsala (Dutch).
- WESTHOFF, V.; DIJK, I. J. W. & PASSCHIER, H. 1946: *Overzicht der Plantengemeenschappen in Nederland*. – *Bibl. Ned. Natuurhist. Ver.* **7**: 1–118 (Dutch).
- WESTHOFF, V.; VAN LEEUWEN, C. G. & ADRIANI, M. J. 1962 [1961]: Some aspects of the relation between vegetation and soil in the dunes of the island of Goeree (Holland), with special attention to the salt-fresh ecotones in xere- and hygrosere. – *Jaarb. Wet. Genoot. Goeree-Overflakkee* **1961**: 46–92 (Dutch, English summary).
- WESTHOFF, V.; SCHAMINÉE, J. & SÝKORA, K. V. 1983: *Aufzeichnungen zur Vegetation der schwedischen Inseln Öland, Gotland und Stora Karlsö*. – *Tuexenia* **3**: 179–198.
- WILLEMS, J. H. 1982: *Phytosociological and geographical survey of Mesobromion communities in Western Europe*. – *Vegetatio* **48**: 227–240.
- WILLEMS, J. H.; VAN DELFT, J. M. E. & RIJKE, M. J. DE 1981: *Observations on North-West European limestone grassland communities – IV. Phytosociological notes on chalk grasslands in Denmark*. – *Folia Geobot. Phytotaxon.* **16**: 391–406.
- WISSKIRCHEN, R. & HAEUPLER, H. 1998: *Standardliste der Farn- und Blütenpflanzen Deutschlands*. – In: H. HAEUPLER (ed.): *Die Farn- und Blütenpflanzen Deutschlands* **1**. – Stuttgart.
- WOLLERT, H. 1964: *Die Grasheiden Mecklenburgs – II. Die Vegetationsverhältnisse auf dem Heideberg bei Teterow*. – *Arch. Freunde Naturgesch. Mecklenburg* **10**: 73–101, 3 tables.
- WOLLERT, H. 1991: *Die Ruderalvegetation des Messtischblattes Teterow (2241; Mittelmecklenburg)*. – *Gleditschia* **19**: 39–68.
- ZIELONKOWSKI, W. 1973: *Wildgrasfluren der Umgebung Regensburgs – Vegetationskundliche Untersuchungen an einem Beitrag zur Landespflanze*. – *Hoppea* **31**: 1–181 + supplement.

Addresses of the authors:

- Dr. Jürgen Dengler (e-mail: dengler@uni-lueneburg.de), Universität Lüneburg, Fachbereich Umweltwissenschaften, Institut für Ökologie und Umweltchemie, Scharnhorststraße 1, D-21335 Lüneburg, Germany;
- Dr. Christian Berg (christian.berg@staunhro.mv-regierung.de), Staatliches Amt für Umwelt und Natur Rostock, Abteilung Naturschutz, Erich-Schlesinger-Straße 35, D-18059 Rostock, Germany;
- Maike Eisenberg, Im Grimm 13, D-21339 Lüneburg, Germany;
- Dr. Maike Isermann (iserm@uni-bremen.de), University of Bremen, Department of Ecology and Evolutionary Biology, Vegetation Ecology and Conservation Biology, Leobener Straße, D-28359 Bremen, Germany;

Florian Jansen (jansen@uni-greifswald.de), Ingo Koska (koska@uni-greifswald.de), Almut Spangenberg (aspangen@uni-greifswald.de) and Dr. Tiemo Timmermann (tiemo@uni-greifswald.de), Ernst-Moritz-Arndt-Universität, Botanisches Institut und Botanischer Garten, Grimmer Straße 86, D-17489 Greifswald, Germany; Swantje Löbel (swantje.lobel@ebc.uu.se), Uppsala University, Evolutionary Biology Centre, Department of Plant Ecology, Villavägen 14, S-75236 Uppsala, Sweden;

Dr. Michael Manthey (manthey@uga.edu), The University of Georgia, Geography Department, Athens, Georgia 30602-2502, U.S.A.; Jens Pätzolt (jens.paezolt@lua.brandenburg.de), Landesumweltamt Brandenburg, Abteilung W5, Berliner Straße 21–25, D-14468 Potsdam, Germany; Dr. Heinrich Wollert (heinrich.wollert@gmx.de), Am Hollerberg 7, D-17166 Teterow, Germany.

Manuscript received: September 03rd/revised version October 25th, 2003.