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New descriptions and typifications of syntaxa within the project 'Plant communities of Mecklenburg-Vorpommern and their vulnerability' – Part II

With one Table

Summary

Within the project 'Plant communities of Mecklenburg-Vorpommern and their vulnerability', a current synopsis of all vegetation types (excluding one-layered cryptogam vegetation) from this federal state in NE Germany has been worked out and published in a two-volume monograph (BERG et al. 2001, 2004a). An extensive data base of vegetation relevés and a consistent methodology provided the basis for the classification. On the one hand, this classification differs in various features from well-known syntaxonomic concepts. On the other hand, the careful application of the Code of Phytosociological Nomenclature has led on several occasions to the conclusion that certain syntaxa lack valid names or that correct names can only be determined after a typification. Consequently all new descriptions, typifications and other nomenclatural decisions which are relevant to our project are being published in separate papers. Most are included in a two-part publication of which this contribution represents the second one.

In an introductory section, we describe some of the special features of our project, discuss the possible contribution of this regional study to the general system of plant communities, and point out the significance of the ICPN. We then briefly explain the nomenclatural evaluations and abbreviations used in the special section, as a supplement to the corresponding paragraphs in Part I (DENGLER et al. 2003). The main substance of the paper deals with

Zusammenfassung

Neubeschreibungen und Typisierungen von Syntaxa im Rahmen des Projektes „Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung" – Teil II

Im Projekt „Pflanzengesellschaften Mecklenburg-Vorpommerns" wurde eine aktuelle Übersicht der Vegetationstypen des Bundeslandes mit Ausnahme der einschichtigen Kryptogamenvegetation erarbeitet und in einer zweibändigen Monografie (BERG et al. 2001, 2004a) veröffentlicht. Grundlage der Klassifikation waren eine umfassende Datenbank mit Vegetationsaufnahmen und ein konsistentes methodisches Konzept. Die erarbeitete Klassifikation weicht einerseits in verschiedenen Punkten von gängigen syntaxonomischen Gliederungen ab. Andererseits führte die korrekte Anwendung des Codes der Pflanzensoziologischen Nomenklatur verschiedentlich zu der Erkenntnis, dass für bestimmte Syntaxa keine gültigen Namen existierten oder dass die Ermittlung der korrekten Namen nur nach zuvor erfolgter Typisierung möglich ist. Deshalb werden die im Rahmen des Projektes erforderlichen Neubeschreibungen, Typisierungen und sonstigen nomenklatorischen Entscheidungen in separaten Zeitschriftenbeiträgen publiziert. Die meisten sind in einer zweiteiligen Artikelfolge enthalten, wovon die vorliegende Veröffentlichung den abschließenden zweiten Teil darstellt.

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the nomenclatural revision of 18 vegetation classes belonging predominantly to the aquatic, semiaquatic or woody vegetation. The following classes are dealt with: Lemnetea, Ruppietea maritimae, Potamogetonetea, Littorelletea, Thero-Salicornietea strictae, Montio-Cardaminetea, Oxycocco-Sphagnetea, Parvo-Caricetea, Phragmito-Magno-Caricetea, Juncetea maritimi, Cakiletea maritimae, Salicetea purpureae, Vaccinio uliginosi-Pinetea, Molinio-Betuletea pubescentis, Alnetea glutinosae, Vaccinio-Piceetea, Quercetea robori-petraeae and Carpino-Fagetea. Within these classes we describe 15 new syntaxa. One illegitimate name is replaced by a *nomen novum*, and in four cases we correct syntaxon names based on taxomomic errors. Finally, lecto- and neotypes of a further 134 syntaxa are designated. In the context of the syntaxa treated, we discuss some nomenclatural problems involved and give reasons for the scheduled proposals to the Nomenclature Commission for *nomina ambigua*, *conservanda*, *inversa* and *mutata*.

The majority of the presented syntaxonomic modifications concern the vegetation of wetlands: In addition to the floristic differentiation of the syntaxa, special emphasis has been put on their clear ecological definition, particularly in terms of nutrient supply, hydrology and alkalinity of their habitats. In the classification of forest and shrub vegetation from hydromorphic sites, we have therefore placed emphasis on the ground vegetation instead of the few predominantly euryecious tree species. Compared to other classifications, the most important differences are as follows: The drawing up of a central order Sphagno fallacis-Eriophoretalia vaginati ord. nov. beside the Sphagno-Ericetalia and the Sphagnetalia magellanici within the Oxycocco-Sphagnetea – Subdivision of the Parvo-Caricetea (mesotraphent mire vegetation) into an acidophilous and a basiphilous subclass (Sphagno fallacis-Caricenea canescentis subcl. nov. and Drepanoclado revolventis-Caricenea diandrae subcl. nov. respectively) – Subdivision of the Phragmito-Magno-Caricetea into the four orders Phragmitetalia australis, Nasturtio officinalis-Glycerietalia fluitantis, Scrophulario umbrosae-Caricetalia paniculatae ord. nov. and Calystegietalia sepium – Subdivision of the Molinio-Betuletea pubescentis (woody vegetation of mesotrophic wetlands) into the orders Salici pentandrae-Betuletalia pubescentis ord. nov. and Calamagrostio canescentis-Salicetalia cinereae – Subdivision of the Alnetea glutinosae (woody vegetation of eutrophic wetlands) into the orders Cardamino amarae-Alnetalia glutinosae ord. nov., Alnetalia glutinosae and Alno-Fraxinetalia excelsioris.

Hierin schildern wir zunächst einige wesentliche Besonderheiten des Projektes, diskutieren den möglichen Beitrag einer solchen regionalen Übersicht zu einem allgemeinen System der Pflanzengesellschaften und weisen auf die große Bedeutung der Nomenklaturregeln hin. Danach werden einige nomenklatorische Bewertungen und Abkürzungen erläutert, die im speziellen Teil Verwendung finden und in der ersten Folge (DENGLER et al. 2003) nicht enthalten waren. Hauptgegenstand ist jedoch die nomenklatorische Behandlung von 18 Vegetationsklassen, die überwiegend zur offenen aquatischen oder semiaquatischen Vegetation sowie zur Gehölzvegetation zählen. Es handelt sich um die Klassen Lemnetea, Ruppietea maritimae, Potamogetonetea, Littorelletea, Thero-Salicornietea strictae, Montio-Cardaminetea, Oxycocco-Sphagnetea, Parvo-Caricetea, Phragmito-Magno-Caricetea, Juncetea maritimi, Cakiletea maritimae, Salicetea purpureae, Vaccinio uliginosi-Pinetea, Molinio-Betuletea pubescentis, Alnetea glutinosae, Vaccinio-Piceetea, Quercetea robori-petraeae und Carpino-Fagetea. Innerhalb dieser Klassen beschreiben wir insgesamt 15 Syntaxa neu. In einem Fall wird ein illegitimer Name durch ein *Nomen novum* ersetzt und viermal korrigieren wir einen Syntaxonnamen infolge sippentaxonomische Irrtümer. Schließlich werden Lecto- und Neotypen für 134 weitere Syntaxa festgelegt. Im Zusammenhang mit den behandelten Gesellschaften diskutieren wir auftretende nomenklatorische Probleme und begründen geplante Anträge an die Nomenklaturkommission auf *Nomina ambigua*, *conservanda*, *inversa* und *mutata*.

Die vorgestellten syntaxonomischen Änderungen betreffen vor allem die Vegetation von Feuchtgebieten: Neben der floristischen Differenzierung der Syntaxa wurde besonderer Wert auf ihre klare ökologische Abgrenzung gelegt, wobei insbesondere die Nährstoffversorgung, die hydrologischen Bedingungen sowie die Alkalinität der Standorte berücksichtigt wurden. Bei der Gliederung der Moorwälder und -gebüsche stand hierbei die floristische Differenzierung anhand der Bodenvegetation anstelle der wenigen hier vorkommenden, überwiegend euryöken Baumarten im Vordergrund. Als wesentliche Neuerungen gegenüber bisherigen Gliederungen lassen sich nennen: Aufstellung einer zentralen Ordnung Sphagno fallacis-Eriophoretalia vaginati ord. nov. neben den Sphagno-Ericetalia and Sphagnetalia-magellanici innerhalb der Oxycocco-Sphagnetea – Einteilung der Parvo-Caricetea (Vegetation mesotropher Moore) in eine azidophile und eine basiphile Unterklasse (Sphagno fallacis-Caricenea canescentis subcl. nov. bzw. Drepanoclado revolventis-Caricenea diandrae subcl. nov.) – Einteilung der Phragmito-Magno-Caricetea in die vier Ordungen Phragmitetalia australis, Nasturtio officinalis-Glycerietalia fluitantis, Scrophulario umbrosae-

Caricetalia paniculatae ord. nov. und Calystegietalia sepium – Einteilung der Molinio-Betuletea pubescentis (Gehölzvegetation mesotropher Feuchtstandorte) in die Ordungen Salici pentandrae-Betuletalia pubescentis ord. nov. und Calamagrostio canescentis-Salicetalia cinereae – Einteilung der Alnetea glutinosae (Gehölzvegetation eutropher Feuchtstandorte) in die Ordnungen Cardamino amaraeAlnetalia glutinosae ord. nov., Alnetalia glutinosae und Alno-Fraxinetalia excelsioris.

1 Introduction

Within the project 'Plant communities of Mecklenburg-Vorpommern and their vulnerability' a state-of-the-art overview of the vegetation types in Mecklenburg-Vorpommern[1] (NE Germany) has been elaborated since 1998 by a team of more than a dozen vegetation scientists (cf. BERG & DENGLER 2004). The results have been published in a two-volume book (BERG et al. 2001, 2004a). The major aim of this project was to develop a syntaxonomic system of all the vegetation types dominated by vascular plants within the research area. This target has been achieved by use of a large data base of vegetation relevés and using a consistent and explicitly documented classification method (cf. DENGLER & BERG 2002; DENGLER 2003; see also DENGLER et al. 2003).

The resulting classification differs in various points from other systems proposed in the syntaxonomic literature. In the naming of the syntaxa we paid particular attention to the strict application of the rules of the International Code of Phytosociological Nomenclature (WEBER et al. 2000; cited as ICPN in the following text). Both the partly novel classification and the compliance with the nomenclatural rules made it necessary to publish new syntaxa and to validate others. Moreover, in many cases the designation of nomenclatural types proved to be necessary for the establishment of the correct syntaxon names within our system or advantageous in terms of nomenclatural stability. Since the ICPN strongly advises against the publication of such new syntaxa, typifications or other nomenclaturally relevant decisions in monographs, we have prepared some separate journal articles to deal with these points. The majority are included in a two-part series in 'Feddes Repertorium', of which the present paper forms the second part. In Part I (DENGLER et al. 2003) we gave a general introduction and dealt with nine classes of herbaceous vegetation growing at anhydromorphic sites. Part II now contains the syntaxa of 18 different classes mostly belonging to wetland and woodland vegetation types. It should be pointed out that authorship and responsibility for the treatments of the different syntaxa rests exclusively with the named individuals who are at the same time the authors of the relevant class chapters in BERG et al. (2004a).

[1] We prefer to use the proper name of this federal state ('Mecklenburg-Vorpommern') in an unaltered manner instead of translating it into English because at least three different versions can be found in recent dictionaries (Mecklenburg-West Pomerania, Mecklenburg-Western Pomerania, Mecklenburg and Western Pomerania) none of which is actually in general use.

2 General aspects

Both the methodology of classification and the thorough application of the nomenclatural rules have played a crucial role in our project (also see DENGLER & BERG 2002; BERG & DENGLER 2004; BERG et al. 2004a). We have spent much time on these tasks since we are convinced that phytosociology only can survive as a scientific discipline if its practitioners apply well-documented and testable methods and give priority to long-established international standards such as the ICPN rather than to personal preferences and habits.

2.1 What is new in our project?

As a result of our efforts, we have presented the first *de novo* classification of all the vegetation types of an area as large as a federal state, using

an extensive data base of single relevés and applying the same unique and consistent methodology throughout (BERG et al. 2001, 2004a). Moreover, we have documented the results in the table-volume (BERG et al. 2001) in a manner that makes the correct application of our methodology comprehensible. In the few other available phytosociological overviews which are founded on data bases of relevés and that cover areas of comparable or greater size, either such a testable classification approach is absent (or at least is not documented in the publication), as is the case with the Dutch (SCHAMINÉE et al. 1995a, 1995b, 1996, 1998; STORTELDER et al. 1999) and the British overviews (RODWELL 1991a, 1991b, 1992, 1995, 2000), or an existing, 'traditional' classification scheme is 'only' reproduced and evaluated, as in the Czech overview by CHYTRÝ & TICHÝ (2003).

Although a previous attempt was made in the Austrian overview (MUCINA et al. 1993a, 1993b; GRABHERR & MUCINA 1993), BERG et al. (2004a) is the first complete phytosociological monograph of a large area that can really claim to have checked all the accepted syntaxon names (531 in total) by consulting their original diagnoses, whether they (or at least their types) conform with the classification concept (i.e. the delimitation of the respective syntaxon) and whether they are valid and legitimate. In addition to the accepted names, c. 3,500 other names (although only the more important ones) have been collected for the synonymic lists, most of them accompanied by a nomenclatural evalutation (for details see DENGLER 2004), and almost 2,000 publications have been utilised and included in the reference list.

2.2 How to deal with syntaxonomy in a regional project?

The revision of the 'general' system of plant communities on the basis of a regional classification is undoubtedly subject to methodological restrictions. On the other hand, the question of better alternatives remains open, in this respect as a global (or at least a Holarctic) approach is not a realistic option and supraregional overviews so far have been possible only for selected syntaxa. Recognising this problem, we have tried to balance our limitations in the following way:

Firstly, all of our authors in their own chapters have not only relied on the relevés from Mecklenburg-Vorpommern stored in our data base but have also to a great extent considered literature from 'outside', though this may vary slightly between the different specialists (cf. the extensive reference list in the book). Secondly, a supraregional synopsis is undoubtedly an essential basis for any 'good' classification – but it is not the only one. As we understand it, there are two other 'ingredients' which also contribute to the quality of a classification, namely a consistent methodology and a comprehensive data base of all the vegetation types within the research area. Without the latter, the fidelity of species cannot be soundly determined, nor can well-founded character species of certain syntaxa be established. The 'best' classification would thus be one developed by applying a clear and generally accepted methodology to a representative data base of all the vegetation types in Europe or even in the whole world. Since phytosociology is still far from this goal at the present time, the aim must be to get there step by step. At the moment, it cannot be decided which comes closer to this goal, a classification for a certain syntaxon based on an overview of a greater area [e.g. the revision of the Rhynchosporion albae communities in Europe by DIERSSEN & REICHELT (1988)] but lacking the possibility of comparisons with all other syntaxa within that area, or a regional survey such as ours but with a well-documented consistent methodology and with the fidelities for all taxa being tested within a large data base. Thirdly, we do not regard our system as a 'final solution', but as a hypothesis whose validity and suitability should be tested within other regional and – as soon as available – within supraregional data bases. We are convinced that a well-founded proposal such as ours will enrich syntaxonomic discussion and therefore promote its progress, especially as we are not sticking blindly to traditional pathways but are in some cases suggesting some fundamentally new solutions.

2.3 What about phytosociological nomenclature?

In spite of our numerous new proposals for the delimitation and the subdivision of syntaxa, only a few of them have had to be newly described (i.e. about three dozen out of 531). For

two reasons we decided not to publish these syntaxa provisionally. Firstly, following on from the discussion in section 2.1, they are much better founded than the vast majority of syntaxa that already exist. Secondly, our extensive researches into phytosociological nomenclature have led us to the conclusion that more than anything else it is the provisional publication of syntaxon names that has given rise to so many of the subsequent nomenclatural errors.

Another central purpose of this paper is the typification of syntaxa that already exist and were published before 1979. The selection of types has been necessary in two cases, i.e. (i) for establishing the correct syntaxon names within our classification when the content of the original diagnosis of a certain syntaxon has been divided into several syntaxa by us; (ii) when an application to the Nomenclature Commission for *Nomina proposita* is intended (see below). Types therefore have been designated not only for accepted syntaxon names in BERG et al. (2004a) but in some cases also for syntaxonomic synonyms and illegitimate names. As pointed out by THEURILLAT & MORAVEC (1990b: 101), typifications generally lead to the stabilisation of syntaxon names and are therefore desirable. However, the selection of types should be done with care, in order to preserve the applicability of commonly used names, and this – as far as possible – within different current classifications. We have tried our best, but it is simply impossible to meet every requirement in every case. Moreover, there are certain rare situations, some of which are discussed in the special section of this paper, where no valid typification at all is possible that would guarantee the present use of a certain name. We see this as the inevitable price which must be paid for the good work which the nomenclatural rules generally do to maximise clarity and stability in the naming of syntaxa. When a name has to be replaced in those rare cases when it has commonly been used in contradiction to its type element, this is neither an argument against the ICPN nor a justified criticism against those who elucidate that situation. One serious problem with typifications is the fact that they are widely dispersed in the syntaxonomic literature and so it cannot be ruled out that for a particular syntaxon that is typified in this paper a type has been earlier and validly designated elsewhere, which would render our typification superfluous and therefore invalid. It would be desirable to disable such 'double typifications' in ignorance, but that would require a central registration of all published typifications. THEURILLAT & MORAVEC (1990b) began such an attempt, by collecting and publishing all typifications on an annual basis, but unfortunately this series was discontinued after their publication covering typifications for the year 1994 (THEURILLAT & MORAVEC 1998).

Finally, we should mention the *nomina proposita*, i.e. names or name forms that only become correct names when the Nomenclature Commission has decided positively upon an application to deal with them. Instead of following this route, which is clearly pointed out in the ICPN, the majority of phytosociologists so far have preferred to use *nomina conservanda*, *inversa* and *mutata* and to reject *nomina ambigua* without any formal decision by the Nomenclature Commission. Since individual preferences in our opinion cannot form the basis of a generally used system of syntaxon names, we are preparing applications to the Committee for Nomina Conservanda, Ambigua, Inversa & Mutata (CNC) of the Nomenclature Commission for more than 100 *nomina proposita* listed in BERG et al. (2004a). We ask all other phytosociologists who want to use *nomina proposita* to follow this formally correct way as well. Applications to the CNC do not form a major topic of the present paper but brief comments are made about them when the syntaxon in question is included in the special section for some other reason.

2.4 Our approach to classification

So far as the classification method is concerned we refer both to the introductory sections in Part I (DENGLER et al. 2003) and the respective chapter of the text-volume of the 'Pflanzengesellschaften Mecklenburg-Vorpommerns' (DENGLER & BERG 2004; for some peculiarities of the classification of the mire vegetation see also KOSKA et al. 2004), where detailed accounts can be found. Only two points in the methodological concept are now discussed here since they are of special relevance for some of the new syntaxa published in this paper:

- The classification has been carried out separately for herbaceous vegetation (including dwarf shrubs) and woodland vegetation (see also BERGMEIER et al. 1990; DENGLER 2003). Herbaceous plants and cryptogams can thus be evaluated as character species in both structural types at the same time.
- Within each syntaxon of superior 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 (also see DIERSCHKE 1994: 324; DENGLER 2003). Such 'negatively characterised' types are very common in the actual vegetation but have often been treated as so-called 'unranked', 'basal' or 'fragmentary' types, or have even been neglected in syntaxonomic systems. With the central syntaxon concept, they can be equally placed in the syntaxonomic system and, like all other communities, can be named according to the ICPN.

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

The arrangement of the syntaxa and the way in which typifications and other nomenclatural points are presented is similar to that followed in DENGLER et al. (2003), where a detailed explanation can be found. We give only a short overview here, including some new points.

3.1 Syntaxa and taxa

All syntaxa are treated under the accepted classes of BERG et al. (2004a), which are arranged in the same manner as in the book. Within the classes, the newly described or newly named syntaxa are treated in separate sections first, followed by the typification section in which the syntaxa are ordered by decreasing rank and alphabetically within the same rank. Unless otherwise stated, all assignments of syntaxon names as well as the nomenclatural evaluations given in this paper refer to the syntaxonomic system presented in BERG et al. (2004a). Due to limited space, it has not been possible to explain this in detail here. Only in classes where revisers have suggested delimitations and subdivisions fundamentally differing from existing systems do we give a short outline in the sections headed 'general concept'.

The nomenclature of taxa follows WISSKIRCHEN & HAEUPLER (1998), KOPERSKI et al. (2000) and SCHOLZ (2000). In the case of neotypes from other sources, the original names may be mentioned additionally in square brackets. The listed character and differential taxa refer to Mecklenburg-Vorpommern, and have been tested within our data base in terms of the relevant criteria (see DENGLER et al. 2003; BERG et al. 2004a).

3.2 Nomenclatural assessment of the names of syntaxa

The nomenclatural evaluation is given in square brackets after the syntaxon names, by referring to the relevant ICPN rules. In addition to those already explained in Part I, the following terms are used here:

3.2.1 *Nomina invalida* – not validly published names

- **Art. 3c** [Art. 2d]: Name that has been published without rank, e.g. as community.
- **Art. 3d (Principle II, Sect. 2)** [Art. 2d]: 'Association' name of the Uppsala school of vegetation science published before 01. 01. 1936.
- **Art. 3d** [Art. 2d]: Syntaxon of a rank that does not correspond to the ICPN.
- **Art. 35:** Double name of a syntaxon which is formed by the combination of the name-giving taxa of the two sole syntaxa of the next subordinate rank that are included in its protologue, when a division of the superior syntaxon separates the two inferior syntaxa.

3.2.2 *Nomina illegitima* – illegitimate names

- **Art. 29b:** Name, none of whose name-giving taxa belongs to the highest stratum.
- **Art. 33:** Homonym which is rejected in favour of another homonym of equal age.
- **Art. 34b:** Syntaxon of a principal rank with the prefix 'Eu-' (before 1979).

3.2.3 Legitimate names whose form must be corrected

- **Art. 10b:** Double name in which the second name-giving taxon does not belong to the highest stratum (application for an inversion must be made to the Nomenclature Commission).

3.2.4 Alterations of names not permitted by the Code

- **Art. 40a (Recomm. 10C):** Addition of a specific or infraspecific epitheton to the syntaxon name when it is not clear which taxon was meant in the original diagnosis.
- **Art. 42:** Unauthorised *nomen inversum* without a decision by the Nomenclature Commission.

3.3 Abbreviations used

The most important abbreviations and signs used in Part I as well as some additional ones used only in Part II are explained below:

*	=	author citation which has been checked and included in the reference list
=	=	assignment of a syntaxonomic synonym (within the syntaxonomic system of BERG et al. 2004a)
≡	=	assignment of a homotypic syntaxon name
C	=	character species
D	=	differential species
non	=	syntaxa which are often erroneously identified with the syntaxon above
p.	=	page
terr.	=	territorial, i.e. a species which fulfils the character species criterion only within the research area (Mecklenburg-Vorpommern)
transgr.	=	transgressive, i.e. a character species of a syntaxon which at the same time is character species of a superior syntaxon

4 The individual syntaxa (continued)

4.1 Lemnetea O.DE BOLÒS & MASCLANS 1955

4.1.1 Typifications

Lemnion minoris O.DE BOLÒS & MASCLANS 1955*: 428:
Lemno-Spirodeletum W.KOCH 1954*: 490 [lectotypus BERG hoc loco] – This alliance has been divided into two alliances by TÜXEN & SCHWABE (in TÜXEN 1974), named Lemnion gibbae TX. & SCHWABE in TX. 1974* and Lemnion trisulcae DEN HARTOG & SEGAL 1964* respectively. However, according to ICPN Art. 29c, Lemnion gibbae is an illegitimate name since the authors included the Lemno-Spirodeletum W.KOCH 1954*. Consequently, the alliance in the more narrowly delimited sense must retain the older name.

Utricularion DEN HARTOG & SEGAL 1964*: 384 nom. illeg. [Art. 33]:
Utricularietum neglectae T.MÜLLER & GÖRS 1960*: 66 [lectotypus BERG hoc loco] – This name should be rejected according to ICPN Art. 33 in favour of the equally old Utricularion vulgaris PASSARGE 1964*.

Utricularion vulgaris PASSARGE 1964*: 12:
Lemno-Utricularietum vulgaris SOÓ ex PASSARGE 1964*: 14 [lectotypus BERG hoc loco]

Lemno-Utricularietum vulgaris SOÓ ex PASSARGE 1964*: 14 nom. illeg. [Art. 32a]:
Lemna minor 4, *Hottonia palustris* 3, *Utricularia vulgaris* 3, *Riccia fluitans* 3, *Warnstorfia fluitans* [*Drepanocladus fluitans*] 1, *Oenanthe aquatica* r; number of species: 6, water-filled kettle hole, Mecklenburg-Vorpommern (not located precisely), c.1979 – relevé taken from DOLL (1991: tab. 6, rel. 9, named 'Lemno-Utricularietum SOÓ 1928') [neotypus BERG hoc loco] – PASSARGE (1964) validated a name which he ascribed to 'SOÓ 1928', but since SOÓ (1947) had already validly published the Lemno-Utricularietum SOÓ 1947*, PASSARGE'S name is a later homonym of this and also a syntaxonomic synonym. The four synoptic lists on which PASSARGE (1964: 13) based his association name represent very different vegetation types of which only column c corresponds to the association as delimited by BERG et al. (2004b).

4.2 Ruppietea maritimae J.TX. ex DEN HARTOG & SEGAL 1964

4.2.1 Chaetomorphato-Ruppietum cirrhosae BR.-BL. in BR.-BL. et al. 1952 nom. corr. BERG hoc loco

Protologue: 'Chaetomorpho-Ruppietum BRAUN-BLANQUET' (BRAUN-BLANQUET et al. 1952: 79)

Type: BRAUN-BLANQUET et al. (1952: rel. at p. 80) [holotypus]

Syn.:
Ruppietum maritimae HOCQUETTE 1927* nom. dub. [Art. 7]
Ruppietum spiralis IVERSEN 1934* [Art. 3c]
Zannichellietum palustris NORDHAGEN 1954* nom. dub.
Potamogetono pectinati Zannichellietum pedicellatae DEN HARTOG 1958* [Syntax. Syn.]
Ruppio spiralis-Zosteretum nanae GILLNER 1960* [Art. 7]
Zannichellietum palustris LANG 1973* p. min. p. [Art. 31]
Ruppietum spiralis IVERSEN ex LINDNER 1978* [Syntax. Syn.]
Zannichellietum pedicellatae POTT 1992* [Syntax. Syn.]
Ruppietum cirrhosae HOCQUETTE 1927* corr. SCHAMINÉE & DEN HARTOG 1995* [Art. 5, 7]
Potamogetono-Ruppietum cirrhosae PASSARGE 1996* [Syntax. Syn.]

Incl.: *Potamogeton pectinatus*-Ges. sensu POTT 1992* p. p.
Ruppia maritima-Zannichellia pedicellata-Ges. sensu FRÖDE 1958*

Note: *Ruppia maritima* L. is given in the species list of the type relevé in BRAUN-BLANQUET et al. (1952). But at that time this name was often used for both microspecies of *Ruppia maritima* agg. occurring in Europe [*R. maritima* s.str. and *R. cirrhosa* (PETAGNA) GRANDE], which are now usually separated at the species level. However, as the authors mention on page 80, additional species can occasionally be found in the association, including *Ruppia rostellata* KOCH, which makes it clear that they differentiated between the two species. Since *R. rostellata* unequivocally corresponds to *R. maritima* s. str. (cf. WISSKIRCHEN & HAEUPLER 1998: 446), they must have meant *R. cirrhosa* with *'R. maritima'* in the type relevé. It is therefore possible to add an epitheton to the association name (ICPN Recomm. 10C), but following ICPN Art. 43 this must be corrected from 'maritimae' to 'cirrhosae'.

4.2.2 Typifications

Zosteretalia BR.-BL. & TX. ex BR.-BL. in BR.-BL. et al. 1952*: 79:
Ruppion maritimae BR.-BL. ex BR.-BL. et al. 1952: 79 [lectotypus BERG hoc loco] – BRAUN-BLANQUET & TÜXEN (1943: 6) who are often cited as authors of the order did not publish it validly according to ICPN Art. 8. The lectotypification presented here is the only possible one since the second alliance included in the protologue of the order, the Posidonion, is mentioned by BRAUN-BLANQUET et al. (1952) without author citation and without including validly published associations. We therefore propose conserving both the Zosteretalia BÉGUINOT ex PIGNATTI 1953* as a later homonym and the Ruppietalia J.TX. ex DEN HARTOG & SEGAL 1964* as a syntaxonomic synonym against the name given above, to maintain the common use of these names.

4.3 Potamogetonetea KLIKA in KLIKA & V.NOVÁK 1941

4.3.1 Typifications

Charo asperae-Potamogetonetum filiformis SPENCE 1964*: 320 nom. invers. propos. (original form: '*Potamogeton filiformis-Chara aspera* association'):
Potamogeton filiformis 4, *P. gramineus* 1, *Chara aspera* +, *Eleocharis palustris* +, *Potamogeton perfoliatus* +; number of species: 5, relevé area: 1 m², Mecklenburg-Vorpommern: Röggeliner See – relevé taken from JESCHKE (1966: tab. 2, rel. 2) [neotypus BERG hoc loco] – Following ICPN Art. 42, the inversion of the name is proposed: In the more narrowly delimited '*Potamogetom filiformis-Chara aspera*-association' within his association SPENCE (1964: 394) presented a synoptic table in which *Potamogeton filiformis* has a constancy of 100% and a mean coverage of 7%, whereas for *Chara aspera* including var. *annulata* the corresponding values are 87% and 1% respectively. In the selected type relevé *Potamogeton filiformis* similarly dominates over *Chara aspera*.

Potamogetono perfoliati-Ranunculetum circinati SAUER 1937*: 497:
SAUER (1937: tab. 5, rel. 3) [lectotypus BERG hoc loco]

4.4 Littorelletea TX. 1947[2]

4.4.1 Typifications

Littorellion uniflorae W.KOCH ex TX. 1937*: 43:
Isoeto lacustris-Lobelietum dortmannae TX. 1937*: 43 [lectotypus BERG hoc loco] – KOCH (1926: 30) who is often cited as the author of the alliance did not publish it validly according to ICPN Art. 8, as the two associations included by him are not valid according to ICPN Art. 7: For the Eleocharitetum acicularis he published neither a relevé nor a synoptic list, whereas for the Isoetetum echinospori he did in fact give a synoptic list but this lacks constancy values for the species other than the character species of the association.

Apio inundati-Littorelletum uniflorae FRÖDE ex JESCHKE 1962: 78:
JESCHKE (1962: tab. 4, rel. 3) [lectotypus BERG hoc loco] – This name thus becomes a syntaxonomic synonym of the Ranunculo flammulae-Juncetum bulbosi OBERD. 1957*.

[2] MUCINA (1997) uses the name Isoeto-Littorelletea BR.-BL. & VLIEGER in VLIEGER 1937* for this class, which is not correct according to ICPN Art. 35, as already pointed out by DIERSSEN (1975): In the protologue of the Isoeto-Littorelletea in VLIEGER (1937), two validly described orders are included, the Isoetalia BR.-BL. ex VLIEGER 1937* (= Nano-Cyperetalia KLIKA 1935*) and the Littorelletalia W.KOCH ex VLIEGER 1937* (= Littorelletalia W.KOCH ex TX. 1937*). In our syntaxonomic system (BERG et al. 2004a) as well as in those of MUCINA (1997) and most other recent phytosociological overviews, these belong to two different classes, i.e. the Isoeto-Nano-Juncetea BR.-BL. & TX. ex BR.-BL. et al. 1952* and the Littorelletea BR.-BL. & TX. ex WESTHOFF et al. 1946*.

4.5 Thero-Salicornietea strictae TX. in TX. & OBERD. 1958[3]

4.5.1 Typifications

Thero-Salicornion BR.-BL. 1933*: 12:
Salsolo sodae-Suaedetum splendentis BR.-BL. 1933*: 13 [lectotypus POLTE hoc loco]

4.6 Montio-Cardaminetea BR.-BL. & TX. ex KLIKA 1948

4.6.1 Typifications

Caricion remotae KÄSTNER 1941*: 202:
Caricetum remotae KÄSTNER 1941*: 143 [lectotypus (Art. 20)] – Both HINTERLANG (1992: 114) and ZECHMEISTER & MUCINA (1994: 401) have proposed the 'Caricetum remotae (KÄSTNER 1941) SCHWICKERATH 1944' as lectotype of the alliance. However, this was not a valid typification since on the one hand a lectotype must be chosen from the elements included in the original diagnosis, i.e. KÄSTNER (1941) and not SCHWICKERATH (1944), and on the other hand the cited author citation of the Caricetum remotae with 'KÄSTNER 1941' in brackets is not correct (see below). Contrary to the statement of HINTERLANG (1992: 114), KÄSTNER (1940) had not already used the name 'Caricion remotae'.

Caricetum remotae KÄSTNER 1941*: 143:
KÄSTNER (1941: tab. 6, rel. 11) [lectotypus KOSKA hoc loco] – An author citation '(KÄSTNER 1941) SCHWICKERATH 1944', as is frequently found in the literature including the recent syntaxonomic revision of the class by ZECHMEISTER & MUCINA (1994), is not correct according to the ICPN. Since KÄSTNER (1941) validly described the association using a legitimate name, there is no reason for an author citation with brackets. One possible reason for the incorrect author citation may be the fact that KÄSTNER also used the names 'Caricetum remotae collinum' and 'Caricetum remotae montanum', in addition to the Caricetum remotae, which would be illegitimate according to ICPN Art. 34a. But on page 143 he makes it clear that he considers them as subtypes within the same community, as can be seen from the following quotation: '. . . kann ich nunmehr zwei Waldsumpfgesellschaften unterscheiden. 1. . . . die . . . Fichtensumpf-Gesellschaft (Caricetum fuscae) . . . 2. . . . die Laubwaldsumpf-Gesellschaft (Caricetum remotae) . . . und zwar . . .die Berglandsform (Caricetum remotae montanum) und . . . die Hügellandsform (Caricetum remotae collinum).' Another reason for the bracketed author citation may be that the association has been emended by SCHWICKERATH (1944) in such a way that only stands (more or less) without *Chrysosplenium oppositifolium* are still included (or at least his publication has been interpreted in that way by subsequent authors). However, according to ICPN Art. 47, the author citation remains unaltered after an emendation. HINTERLANG (1992: 114) had already published a different 'typification' of the Caricetum remotae KÄSTNER 1941* which, however, was not valid since he selected a relevé as 'holotypus' (i.e. SCHWICKERATH 1944: tab. 63, rel. 2) which was not included in the relevant protologue of KÄSTNER (1941).

4.7 Oxycocco-Sphagnetea BR.-BL. & TX. ex WESTHOFF et al. 1946

4.7.1 General concept (T. TIMMERMANN)

The Oxycocco-Sphagnetea are generally divided in two orders: Sphagno-Ericetalia tetralicis SCHWICKERATH 1941* nom. invers. propos. and Sphagnetalia magellanici KÄSTNER & FLÖSSNER 1933* nom. mut. propos. (DIERSSEN 1977, 1980, 1982; DIERSSEN et al. 1988; POTT 1995; SCHAMINÉE et al. 1995d). According to our classification methodology (see sect. 2.4), a third (central) order is added here in order to integrate regionally widespread stands without character species below the class level at the same syntaxonomic rank (see sect. 4.7.2 and 4.7.3). Within this classification, the ecological uniformity of syntaxa in terms of the site conditions, particularly in terms of the nutrient supply, and represented by the entire species combination, is emphasised (for details, see TIMMERMANN 2004). Consequently the boundary between the Oxycocco-Sphagnetea and the Parvo-Caricetea WESTHOFF ex DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969* nom. cons. propos. (see sect. 4.8) represents the boundary between oligotrophic and mesotrophic site conditions (for details on the concept of trophic classes, see KOSKA 2001a, 2001b; for critical remarks see DIERSSEN & DIERSSEN 1985). The vegetation of oligo- to slightly mesotrophic hollows and floating mats

[3] This class has been published in TÜXEN & OBERDORFER (1958: 24) under the name 'Thero-Salicornietea strictae TX. 1954'. Since 'TX. 1954' does not refer to a separate publication but to the year in which the excursion reported in the book took place, the correct author citation reads as given above. As the authors do not make reference to the subclass Thero-Salicornienea PIGNATTI 1953*, neither the citation of PIGNATTI (1953) in brackets nor the omission of the epitheton 'strictae', both suggested by MUCINA (1997: 127), is correct.

(Scheuchzerion palustris NORDHAGEN ex TX. 1937*) has thus been placed within the Oxycocco-Sphagnetea, due to the fact that its dominant species prefer oligotrophic and acidic sites (DIERSSEN 1980; DIERSSEN & DIERSSEN 1985; SCHAMINÉE et al. 1995c), as previously proposed by NORDHAGEN (1937), DUVIGNEAUD (1949), DU RIETZ (1954), JENSEN (1961) and NEUHÄUSL (1972), and this has been confirmed for Mecklenburg-Vorpommern by our data set. This incorporation of the major part of the Scheuchzerion palustris (= Rhynchosporion albae W.KOCH 1926* sensu auct.) into the Oxycocco-Sphagnetea differs from most recent classifications, which emphasise the occurrence of characteristic species such as *Carex limosa*, *Rhynchospora alba, Scheuchzeria palustris* and *Sphagnum cuspidatum* that occur in acidic to base-rich habitats, especially in the boreal zone of the Holarctic (e.g. DIERSSEN 1977, 1980, 1982; DIERSSEN & REICHELT 1988; DIERSSEN et al. 1988; STEINER 1992; see also sect. 4.8.1 and 4.8.7). However, the classification proposed in TIMMERMANN (2004) is a compromise between floristic and ecological uniformity within the syntaxa concerned, and has so far only been verified for NE Germany. Although similar proposals have previously been rejected (DIERSSEN 1980), an improved comparability of Holarctic wetland syntaxa in terms of their ecological site conditions remains a challenge for vegetation science. In spite of the uncertainties, in particular as regards the concept of trophy (see SUCCOW 1988) and the ecological behaviour of species within different regions (see STEINER 1992; TIMMERMANN 2004), our syntaxonomic concept could be a step in this direction.

4.7.2 Sphagno fallacis-Eriophoretalia vaginati TIMMERMANN ord. nov. hoc loco

According to our syntaxonomic concept (see 2.4), communities without character species other than those of the superior ranks are classified as central syntaxa. Since the Sphagno recurvi-Eriophoretum vaginati HUECK 1929* nom. invers. propos. lacks character species below the class level, it is classified within a new central order instead of being set aside in appendices (e.g. STEINER 1993b; SCHAMINÉE et al. 1995d). This integration into the regular syntaxonomic system seems adequate, particularly as this community is common in Central Europe and is well characterised by the absence of the character species of the Sphagnetalia magellanici KÄSTNER & FLÖSSNER 1933* nom. mut. propos. and of the Sphagno-Ericetalia tetralicis SCHWICKERATH 1941* nom. invers. propos. According to present knowledge, the central order only contains one alliance (Sphagno fallacis-Eriophorion vaginati all. nov., see 4.7.3) with the association mentioned.

Type: Sphagno fallacis-Eriophorion vaginati all. nov. (see section 4.7.3) [holotypus]
Syn.: Scheuchzerietalia palustris NORDHAGEN ex TX. 1937* p. p. [typo excl.] Sphagno-Caricetalia SUCCOW 1974* p. p. [typo excl.]
C/D: [to be dropped because it is the central order within the class]

4.7.3 Sphagno fallacis-Eriophorion vaginati TIMMERMANN all. nov. hoc loco

According to present knowledge, this is the sole alliance within the central order of the class (cf. 4.7.2) and itself contains only the type association.

Type: Sphagno recurvi-Eriophoretum vaginati HUECK 1929*: 107 nom. invers. propos.
Syn.: Rhynchosporion albae W.KOCH 1926* p. p. [typo excl.] Sphagnion recurvi SUCCOW 1974* p. p. [descr. incl., typo excl.]
C/D: [to be dropped because it is the sole alliance within the order]

4.7.4 Lycopodiello inundatae-Rhynchosporetum fuscae SCHAMINÉE et al. ex TIMMERMANN ass. nov. hoc loco

This association has often been included in the Sphagno tenelli-Rhynchosporetum albae OSVALD 1923* nom. cons. et invers. propos. due to its ecological and floristic affinity (e.g. DIERSSEN 1977, 1980; DIERSSEN & DIERSSEN 2001). As in SCHAMINÉE et al. (1995d) and PETERSEN (2000), it is incorporated here into the Ericion tetralicis SCHWICKERATH 1933* because our concept of the Scheuchzerion palustris NORDHAGEN ex TX. 1937* excludes base-rich habitats. Nevertheless, the few phytosociological relevés from Mecklenburg-Vorpommern indicate a stronger floristic relationship of the association with the Sphagno-Ericetalia tetralicis SCHWICKERATH 1941* nom. invers. propos. rather than with the correspond-

ing orders of the Parvo-Caricetea WESTHOFF ex DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969* nom. cons. propos. through slightly basiphilous species with predominantly oceanic distribution (e.g. *Drosera intermedia*, *Carex nigra*, *Juncus squarrosus*, *Rhynchospora fusca*).

Type: *Eriophorum angustifolium* 1, *Hydrocotyle vulgaris* 1, *Rhynchospora fusca* 1, *Sphagnum compactum* 1, *Drosera intermedia* +, *D. rotundifolia* +, *Erica tetralix* +, *Lophozia ventricosa* +, *Lycopodiella inundata* +, *Molinia caerulea* +, *Sphagnum molle* +, *Viola palustris* +; number of species: 12, relevé area: 20 m^2, wet dune slack, Mecklenburg-Vorpommern: island of Hiddensee: between Witte and Neuendorf – relevé taken from FRÖDE [1950: tab. 16, rel. 2, named 'Rhynchosporetum albae (Degenerationsphase)' = rel. no. 48754 in the vegetation data base of Mecklenburg-Vorpommern] [holotypus hoc loco]

Syn.: Ericetum tetralicis ALLORGE 1922* p. p. [typo excl.]
Rhynchosporetum ALLORGE & GAUME 1931* [Art. 7]
Rhynchosporetum DIEMONT & TX. in TX. 1937* [typo incl.; Art. 32a]
Rhynchosporetum fuscae LOUIS & LEBRUN 1942 p. p. [Art. 32a]
Lycopodio-Rhynchosporetum ['ALLORGE & GAUME 1925'] SCHAMINÉE et al. 1995d* [Arts. 5, 7]

Incl.: 'sables tourbeux à *Rhynchospora alba* et *Lycopodium inundatum*' sensu ALLORGE & GAUME 1931* p. p.
Lycopodiella inundata-[Ericion tetralicis]-Ges. sensu PETERSEN 2000*

Non: Rhynchosporetum albae W.KOCH 1926*

C: *Drosera intermedia*, *Lophozia ventricosa*, *Rhynchospora fusca* (transgr.), *Sphagnum compactum* (terr.), *Sphagnum tenellum* (terr.)

D: *Hydrocotyle vulgaris*, *Viola palustris*

Note: Contrary to the assumption by SCHAMINÉE et al. (1995d: 297), ALLORGE & GAUME ('1925', read: 1931) did not validly publish an association 'Lycopodio-Rhynchosporetum'. Instead, they only used the naming of concrete stands as quoted above under 'incl.'. SCHAMINÉE et al. (ibid.) therefore unintentionally and invalidly published a new association, which is now validated here.

4.7.5 Typifications

Erico-Ledetalia palustris TX. 1937*: 110:
Oxycocco-Ericion NORDHAGEN ex TX. 1937*: 113 [lectotypus TIMMERMANN hoc loco] – This alliance name was only published provisionally by NORDHAGEN (1937). On page 81 he wrote: 'Am deutlichsten tritt vorläufig eine nordwesteuropäische Untergruppe mit mehr oder weniger ozeanisch betonten Soziationen hervor (etwa „Oxycocco-Ericion tetralicis")'.

Scheuchzerion palustris NORDHAGEN ex TX. 1937*: 60:
Scheuchzerietum palustris TX. 1937*: 61 [lectotypus (Art. 20)] – The alliance name was proposed by NORDHAGEN (1937) only provisionally (ibid., p. 17: 'möchte ich … den Verbandsnamen "Scheuchzerion palustris" vorschlagen') and was then validated by TÜXEN (1937) in the same year.

Sphagnion europaeum SCHWICKERATH 1941*: 252 nom. illeg. [Art. 34a]:
Sphagnetum papillosi SCHWICKERATH 1941*: 252, non JONAS 1932* [lectotypus TIMMERMANN hoc loco] – Through this typification the name is connected with communities of strict oceanic distribution and the alliance consequently does not occur in Mecklenburg-Vorpommern.

Carici limosae-Sphagnetum recurvi HUECK 1929*: 94:
HUECK (1929: tab. 16, rel. 3) [lectotypus TIMMERMANN hoc loco] – The same association was previously described by HUECK (1925) when he still was following the Uppsala school. However, according to ICPN Art. 3d in combination with Principle II, Sect. 2, this is an invalid publication. The first valid description using the Braun-Blanquet approach therefore dates from 1929. Through the typification given above the name becomes a syntaxonomic synonym of the Caricetum limosae OSVALD 1923*. The latter is a name of the Uppsala school and should be conserved because of its widespread use (e.g. STEINER 1993a; POTT 1995; RENNWALD 2002), according to ICPN Art. 52 in combination with Principle II, Sect. 2.

Ericetum tetralicis ALLORGE 1922*: 252:
ALLORGE (1922: tab. 20, rel. 7) [lectotypus TIMMERMANN hoc loco]

Sphagno magellanici-Ledetum SUKOPP ex NEUHÄUSL 1969*: 108 nom. invers. et mut. propos. (original form: 'Ledo-Sphagnetum medii'):
Sphagnum recurvum agg. [*Sphagnum recurvum*] 5, *Eriophorum vaginatum* 3, *Aulacomnium palustre* 2, *Vaccinium oxycoccus* 2, *Andromeda polifolia* 1, *Betula pubescens* (height: 40 cm) 1, *Calluna vulgaris* 1, *Drosera rotundifolia* 1, *Warnstorfia fluitans* [*Drepanocladus fluitans*] 1, *Bryum* sp. +, *Cephalozia connivens* +, *Ledum palustre* +, *Pinus sylvestris* (height: 10 cm) +, *Pohlia nutans* +, *Polytrichum strictum* +, *Sphagnum magellanicum* 1; number of species: 16, relevé area:

25 m², oligotrophic kettle-hole mire in the young moraine area, NE Germany – relevé taken from HUECK (1929: tab. 22, rel. 3) [neotypus TIMMERMANN hoc loco] – This association was only provisionally published by SUKOPP (1959; ICPN Art. 3b). The inversion of the name must be proposed following ICPN Art. 10b, since *Sphagnum* is a moss whereas *Ledum* belongs to the herb-dwarf shrub layer whose coverage in the majority of the stands exceeds 25%. The *nomen mutatum* is proposed in accordance with ICPN Art. 45 because the name *Sphagnum medium* is no longer used instead of *S. magellanicum* in the most important taxonomic literature of the last 20 years. The association is defined with reference to the concept of SUKOPP (1959) who distinguished a treeless phase of the association as well as a phase with a tree layer (*Pinus sylvestris* or *Betula pubescens*). In contrast to NEUHÄUSL (1969) and DIERSSEN (1980), the Sphagno magellanici-Ledetum as described here represents only the treeless phase but is typically characterised by a sparse layer (<25% cover) of predominantly puny specimens of *Pinus sylvestris* or *Betula pubescens* which seldom exceed a few metres in height.

Sphagno recurvi-Eriophoretum vaginati HUECK 1929*: 107 nom. invers. propos. (original form: '*Eriophorum vaginatum-Sphagnum recurvum*-Assoziation')

HUECK (1929: tab. 22, rel. 5) [lectotypus TIMMERMANN hoc loco] – The same association was previously proposed by HUECK (1925), but as he followed the Uppsala school of vegetation science at that time this publication was invalid according to ICPN Art. 3d in combination with Principle II, Sect. 2. The inversion of the name must be proposed following ICPN Art. 10b, since *Sphagnum* is a moss whereas *Eriophorum* belongs to the herb layer whose cover in the majority of the stands exceeds 25%.

4.8 Parvo-Caricetea WESTHOFF ex DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969 nom. cons. propos.[4, 5]

4.8.1 General concept (I. KOSKA & T. TIMMERMANN)

Until now the classification of wetland vegetation according to the Braun-Blanquet approach has been mainly based on associations characterised by dominant species, especially sedges or other wetland graminoids. As a result, the descriptions of these associations and of related higher syntaxa have a broad and diffuse content referring to the complete species combination and the site conditions. This approach has been preferred by many authors, because of tradition and because of its simple application (DIERSSEN 1996), but it has also been criticised for the low indicational value of the principal syntaxonomic levels referring to ecological conditions (see the references in SUCCOW 1974; KOSKA et al. 2001a). In our concept of the Parvo-Caricetea (and similarly for the Oxycocco-Sphagnetea BR.-BL. & TX. ex WESTHOFF et al. 1946* and Phragmito-Magno-Caricetea KLIKA in KLIKA & V.NOVÁK 1941*, see sect. 4.7, 4.9), we largely reject the dominance criterion for superior syntaxa and restrict it to the subdivision of associations. With reference to the proposal of SUCCOW (1974), we are basing the classification on differences of the whole species combination and on species group combinations, respectively, which represent well-defined sequences within gradients of the main site factors (see KOSKA et al. 2001b). Starting from such an ordination, we have delimited higher syntaxa by groups of frequent and wide-ranging species, which we have interpreted as character species and which show considerable agreement with the usual character species groups. Starting with higher syntaxa, we then divided them into lower syntaxa, which is not the usual way (see DIERSCHKE 1994). An important reason for this direction in our classifi-

[4] According to ICPN Art. 35, the name Scheuchzerio-Caricetea fuscae TX. 1937* cannot be retained for the class of mesotraphent mire vegetation as delimited by KOSKA & TIMMERMANN (2004): TÜXEN (1937) included two orders in the protologue of his class, the Scheuchzerietalia palustris NORDHAGEN ex TX. 1937* and the Caricetalia fuscae ['(KOCH 1928) NORDHAGEN 1937'] TX. 1937. The Scheuchzerietalia palustris have been designated as lectotype of the class by DIERSSEN (1980). In BERG et al. (2004a) however, major parts of this order (including its type) have been transferred to the class Oxycocco-Sphagnetea (see 4.7), where they become a syntaxonomic synonym of the Sphagnetalia magellanici KÄSTNER & FLÖSSNER 1933* nom. mut. propos. A different name has thus to be found for the remaining part of the former Scheuchzerio-Caricetea fuscae. According to our enquiries, two valid names are available: Caricetea fuscae OBERD. ex L. KUHN 1954* and Parvo-Caricetea WESTHOFF ex DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969*, the second of which we propose as a *nomen conservandum* because of its more widespread use (see sect. 4.8.7).

[5] In contrast to the original diagnosis in WESTHOFF & DEN HELD (1969) and to WESTHOFF et al. (1995), who use the spelling 'Parvocaricetea', we prefer the hyphenated version for the reasons given in DENGLER (2003: 183) and DENGLER et al. (2003: 590). We consider this change to be an orthographic variant, which is permitted by the ICPN.

cation was that higher syntaxa show more differential and character species and are thus better characterised than lower ones. When the 'traditional' associations were checked, some of them proved to be insufficiently characterised according to our concept since their so-called 'character species' frequently occur in different associations or even in different higher syntaxa.

Despite a fundamental conformity with recent proposals for Central Europe (e.g. DIERSSEN 1982; 1996; OBERDORFER 1992a; STEINER 1993a; POTT 1995; SCHAMINÉE et al. 1995c; WESTHOFF et al. 1995; SCHUBERT et al. 2001), our syntaxonomic system shows significant differences. The most prominent one is that plant communities of oligotrophic sites usually classified as order Scheuchzerietalia palustris NORDHAGEN ex TX. 1937* within the class Scheuchzerio-Caricetea fuscae TX. 1937*, are transferred to the class Oxycocco-Sphagnetea BR.-BL. & TX. ex WESTHOFF et al. 1946* (see sect. 4.7). As a result of this transfer, the remainder of the class has to be named Parvo-Caricetea WESTHOFF ex DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969* (see footnote 4). But unlike SCHAMINÉE et al. (1995c) and WESTHOFF et al. (1995), we have not defined an independent class Scheuchzerietea palustris DEN HELD et al. in WESTHOFF & DEN HELD 1969* because this class would have too few character species and, moreover, the alliances of the Scheuchzerietea (Rhynchosporion albae W.KOCH 1926* and Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949*) show strong connections to the Oxycocco-Sphagnetea and also to the Parvo-Caricetea. Other important alterations relating to the content of the class are, firstly, the integration of mesotraphent species combinations with *Menyanthes trifoliata*, *Sphagnum* ssp. and others usually classified within the Magno-Caricion elatae W.KOCH 1926* or Phragmition communis W.KOCH 1926* as a consequence of the dominance of character species like *Phragmites australis*, *Carex elata* or *C. rostrata*; and, secondly, the integration of the major part of the Utricularietea DEN HARTOG & SEGAL 1964*. Following WESTHOFF et al. (1995), we have rejected the floristic and spatial autonomy of this class, at least so far as Mecklenburg-Vorpommern is concerned, because its character species are restricted to shallow water habitats such as hollows or the riparian zone. The character species of the Utricularietea listed in the literature clearly show a high constancy and abundance in sedge or reed stands and only rarely spread into open aquatic communities [the latter stands in BERG et al. (2004a) have been integrated within the Lemnetea O.DE BOLÒS & MASCLANS 1955*, Charetea F.FUKAREK ex KRAUSCH 1964* and Potamogetonetea KLIKA in KLIKA & V.NOVÁK 1941*].

We also divide the class Parvo-Caricetea itself in an unusual way: Two subclasses are distinguished, because there is a very pronounced floristic differentiation between the Sphagno fallacis-Caricenea canescentis subcl. nov. of acidic habitats (pH_{KCl} <4,8, see sect. 4.8.3) and the Drepanoclado-Caricenea diandrae subcl. nov. of base-rich habitats (see sect. 4.8.2). Furthermore, two of the three orders are weakly provided with character species of their own rank but can be satisfactorily treated as the central orders of their respective subclasses. Finally, we found it necessary to differentiate more than three syntaxonomic levels. A similar division has been proposed at the level of orders by DU RIETZ (1949, 1954) and SUCCOW (1974) and at the class level by TRASS (1963) and MALMER (1968). It is based on a floristic differentiation of the acidity gradient into three units (acidic, subneutral i.e. moderately base-rich, and alkaline), as has been proposed by these authors. The floristic differences between subneutral and alkaline (pH_{KCl} > 6,4) sites within Drepanoclado-Caricenea diandrae are less pronounced. We separate them at a lower syntaxonomic level. This subdivision according to the acidity gradient differs from the general approaches (see citations above), which accept dominance-orientated associations covering a wide spectrum of acidity. By doing so, they usually divided the acidity gradient into two parts, drawing the line at varying values but mostly somewhere in the middle of the subneutral range (see above).

The Sphagno fallacis-Caricenea canescentis consists of a single order and have some (but much fewer) character species than the other subclass (see sect. 4.8.3). They are therefore interpreted as the central subclass. The Drepanoclado-Caricenea diandrae have many

character species and are divided into two orders.

The Caricetalia davallianae BR.-BL. 1950* nom. cons. propos. are notably rich in species as well as in character species. The order represents the vegetation of percolated and rarely inundated mires (especially spring and percolation mires). It is divided into the Caricion davallianae KLIKA 1934*, which represents the vegetation of alkaline (calcareous) sites, and a restricted 'core version' of the Caricion nigrae W.KOCH 1926* nom. corr. (see sect. 4.8.5), which represents that of moderately base-rich sites.

Most plant communities of the second order Drepanoclado revolventis-Caricetalia SUCCOW 1974* are not as species-rich. They grow in ('topogenous') depressions, riparian zones and flat mires which are subject to inundation, to changing water levels and in certain places even to waves of moderate energy. Only some higher wetland plants can tolerate such conditions. This order is thus interpreted as central to the subclass. The name was proposed by SUCCOW (1974) with a slightly different meaning, but is the only available and typologically accurate one for this syntaxon. It integrates major parts of the Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949*, being the 'base-rich remainder' of the former order Scheuchzerietalia. Furthermore, it integrates the vegetation of calcareous riparian zones (with e.g. *Cladium mariscus*, *Eleocharis quinqueflora*) and a part of the former Caricetalia fuscae W.KOCH 1926* nom. amb. propos. (Comaro palustris-Juncion effusi PASSARGE 1999*). The high diversity of species combinations within the order Drepanoclado revolventis-Caricetalia has faciliated its further division into two suborders, each divided into two alliances (see KOSKA & TIMMERMANN 2004). The first and central suborder Caricenalia diandrae SUCCOW 1974* has few character species. We follow the proposal by SUCCOW (1974), who described it as a syntaxon including a moderately basiphilic 'core version' of the Caricion lasiocarpae. As a second alliance, the Comaro palustris-Juncion effusi PASSARGE 1999* has been added, which has a distinct pioneer character within similar hydrochemical conditions. The second suborder Schoenenalia nigricantis PIGNATTI 1953* includes communities from similar but alkaline (calcareous) site conditions. We subordinate two alliances to it. The Eleocharition quinqueflorae PASSARGE 1978* was proposed by PASSARGE (1964, validated in 1978). It describes mostly pioneer-like vegetation and can be regarded as the typological core of the suborder. Reed vegetation mainly composed of basiphilic species such as *Cladium mariscus* or *Scorpidium scorpioides* is set alongside it as a second and central alliance, the Scorpidio scorpioidis-Cladion marisci (W.BRAUN 1968*) SUCCOW 1974*. It settles on similar but less disturbed sites and shows *Cladium mariscus* as single character species. DUVIGNEAUD (1949) and BRAUN (1968) pointed out the relationship of this vegetation to the mesotraphent Scheuchzerio-Caricetea fuscae but SUCCOW (1974) was the first to include it as alliance within this class. The species compositions of the Scorpidio-Cladion have usually been included within the Magno-Caricion elatae W.KOCH 1926*, partly also within the Scorpidio-Utricularion minoris PIETSCH 1965* nom. inval. [Art. 8] and the Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949*. The species combinations of the Eleocharition quinqueflorae have been classified within the Caricion davallianae KLIKA 1934* by most authors. Despite an existing similarity to the Caricion davallianae, the associations of the Schoenenalia nigricantis are less species-rich and contain relatively few character species of this alliance, but share many species as well as the specific site conditions of the topogenous water regime with the Caricenalia diandrae. For this reason we preferred not to include them within the Caricetalia davallianae.

The order Caricetalia fuscae W.KOCH 1926* is usually accepted as an important part of the class. In our concept it has been divided into one section representing acidic environments (Caricion canescenti-nigrae NORDHAGEN ex TX. 1937* nom. corr., see sect. 4.8.3), another section of moderately base-rich 'topogeneous' mires and riparian zones (associated predominantly with our Comaro palustris-Juncion effusi, see above), and a remaining 'core' of moderately base-rich mire sites fed by percolating ground water (Caricion nigrae W.KOCH 1926* nom. corr.). The latter alliance as well as the floristically similar Caricion davallianae of alkaline (calcareous) sites is

integrated into the Caricetalia davallianae as proposed by RYBNIČEK (1974) who described his 'core version' of the Caricion nigrae as Sphagno-Tomenthypnion nitentis DAHL 1956* nom. illeg. [Art. 29b] (also see the remarks for the Caricetum fuscae W.KOCH 1926* in sect. 4.8.7).

The re-arrangement of the former order Scheuchzerietalia has been mentioned above. Those parts belonging to the Parvo-Caricetea have been allocated to the Caricion canescenti-nigrae, the Caricion lasiocarpae and the Scorpidio-Cladion according to their floristic response to acidity. A relationship to the nutrient-poor 'core' of the Scheuchzerietalia has remained, since in each of these alliances one association has been differentiated by some of the character species of the former Scheuchzerietalia together with those of the former Utricularietea (Sphagno recurvi-Caricetum rostratae STEFFEN 1931*, Caricetum lasiocarpae OSVALD 1923* nom. cons. propos., Scorpidio-Caricetum elatae W.BRAUN 1968* nom. mut. propos.).

4.8.2 Drepanoclado revolventis-Caricenea diandrae KOSKA subcl. nov. hoc loco

In this subclass, the basiphilic and correspondingly more species-rich wing of the class as indicated by character species such as *Calliergonella cuspidata* or *Parnassia palustris* and differential species such as *Mentha aquatica* is combined (see sect. 4.8.1; KOSKA & TIMMERMANN 2004). As a result only parts of the former orders Scheuchzerietalia palustris NORDHAGEN ex TX. 1937* and Caricetalia fuscae W.KOCH 1926* nom. amb. propos. but the whole of the Caricetalia davallianae BR.-BL. 1950 nom. cons. propos. are included. Besides the Caricetalia davallianae we distinguish a second and central order, the Drepanoclado revolventis-Caricetalia SUCCOW 1974* (see sect. 4.8.1).

Type: Caricetalia davallianae BR.-BL. 1950* nom. cons. propos. [holotypus hoc loco]

Incl.: Drepanocladetea TRASS 1963* [Art. 8, 29b] Scorpidietalia DU RIETZ 1954* [Art. 8, 29b] Drepanoclado-Caricetalia SUCCOW 1974*

C: *Betula humilis, Bryum pseudotriquetrum, Calliergon giganteum, Calliergonella cuspidata, Campylium stellatum, Carex appropinquata, C. buxbaumii, C. diandra* (transgr.)*, C. dioica, C. elata* (terr.)*, C. flacca* (terr.)*, C. flava* subsp. *flava, C. hostiana, C. lepidocarpa, Cinclidium stygium, Cladium mariscus* (transgr.)*, Climacium dendroides, Dactylorhiza incarnata, Drepanocladus revolvens* agg.*, D. sendtneri, Epipactis palustris, Equisetum fluviatile* (terr.)*, Eriophorum latifolium, Fissidens adiantoides, Helodium blandowii, Hieracium lactucella, Hypericum tetrapterum* (terr.)*, Juncus subnodulosus, Liparis loeselii, Listera ovata* (terr.)*, Meesia triquetra, Paludella squarrosa, Parnassia palustris, Pedicularis palustris, Philonotis calcarea* (terr.)*, Ph. fontana* subsp. *fontana* (terr.)*, Pinguicula vulgaris, Plagiomnium elatum, P. ellipticum, Polygala amarella* (terr.)*, Preissia quadrata* (terr.)*, Primula farinosa, Schoenus ferrugineus, Tomenthypnum nitens, Triglochin palustre, Valeriana dioica* (terr.)

D: *Agrostis stolonifera, Briza media, Caltha palustris, Cardamine pratensis, Carex disticha, C. nigra, C. panicea, Cirsium palustre, Crepis paludosa, Eleocharis palustris, Equisetum palustre, Eupatorium cannabinum, Festuca rubra* agg.*, Filipendula ulmaria, Galium uliginosum, Geum rivale, Holcus lanatus, Juncus articulatus, Linum catharticum, Lotus pedunculatus, Lythrum salicaria, Mentha aquatica, Myosotis scorpioides* subsp. *scorpioides, Poa pratensis, P. trivialis* subsp. *trivialis, Potentilla erecta, Ranunculus acris, Salix repens, Selinum carvifolia, Silene flos-cuculi, Stellaria palustris, Succisa pratensis*

4.8.3 Sphagno fallacis-Caricenea canescentis TIMMERMANN subcl. nov. hoc loco

As elucidated in section 4.8.1, this subclass is mainly characterised negatively and contains mire communities from mesotrophic, acidic sites. In Mecklenburg-Vorpommern it only consists of one alliance (Caricion canescenti-nigrae NORDHAGEN ex TX. 1937* nom. corr., see sect. 4.8.4) with two associations (Sphagno recurvi-Caricetum rostratae STEFFEN 1931* and Carici canescentis-Agrostietum caninae TX. 1937*).

Type: Sphagno-Caricetalia SUCCOW 1974* [holotypus hoc loco]

C: *Agrostis canina, Calamagrostis canescens* (terr.)*, Calla palustris* (terr.)*, Carex canescens, Lysimachia thyrsiflora* (terr.)*, Sphagnum denticulatum* var. *inundatum* (transgr.)*, S. squarrosum* (terr.)

D: *Calliergon stramineum, Eriophorum vaginatum, Polytrichum commune* var. *commune, Sphagnum cuspidatum, S. recurvum* agg.*, Vaccinium oxycoccos*

4.8.4 Caricion canescenti-nigrae NORDHAGEN ex TX. 1937 nom. corr. TIMMERMANN hoc loco

Protologue: 'Caricion canescentis-fuscae (KOCH 1928) NORDHAGEN 1937' (TÜXEN 1937: 62)
Type: Carici canescentis-Agrostietum caninae TX. 1937*: 62 [lectotypus TIMMERMANN & KOSKA hoc loco]
Syn.: Caricion fuscae W.KOCH 1926* sensu auct. p. p. [typo excl.]
Caricion canescenti-goodenovii NORDHAGEN 1937* [Art. 8]
Sphagno-Utricularion T.MÜLLER & GÖRS 1960* p. p.
Sphagnion recurvi SUCCOW 1974* p. p. [Syntax. Syn.]
Incl.: Comaro-Juncenion effusi PASSARGE 1999* p. p.
Ass.-Gr. Sphagno-Caricetum lasiocarpae sensu PASSARGE 1964* p. p.
Note: The name of this alliance was first used as 'Caricion canescenti-goodenovii' by NORDHAGEN (1937). However, this was not a valid publication since he did not include any validly described associations. TÜXEN (1937) in the same year then validated the name as 'Caricion canescentis-fuscae'. According to KIFFE (in WISSKIRCHEN & HAEUPLER 1998: 127), *Carex fusca* ALL. is not identical with the Central European *C. nigra* (L.) REICHARD. According to ICPN Art. 43 all syntaxon names based on the pseudonym *Carex fusca* auct., non ALL. must therefore be corrected.

4.8.5 Caricion nigrae W.KOCH 1926 nom. corr. KOSKA hoc loco

Protologue: 'Caricion fuscae' (KOCH 1926: 65)
Type: Caricetum fuscae W.KOCH 1926*: 66 [lectotypus DIERSSEN (1980: 413)]
Syn.: Magno-Caricion elatae W.KOCH 1926* sensu auct. p. p. [typo excl.]
Caricion davallianae KLIKA 1934* p. p. [typo excl.]
Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949* p. min. p. [typo excl.]
Warnstorfio-Scorpidion sensu DU RIETZ 1949* p. p. [Art. 29b]
Sphagno-Tomenthypnion nitentis DAHL 1956* [Art. 29b]
Incl.: Caricenion davallianae (KLIKA 1934*) PASSARGE 1999* p. p. [descr. incl., typo excl.]
Caricenion lasiocarpae (VANDEN BERGHEN in LEBRUN et al. 1949*) PASSARGE 1999* p. min. p. [descr. incl., typo excl.]
Excl.: Caricetum davallianae W.KOCH 1926*
Caricetum lasiocarpae W.KOCH 1926* [Art. 31]
Juncetum subnodulosi W.KOCH 1926*
Schoenetum nigricantis W.KOCH 1926*
Note: For the reasons for correcting the name, see the Note in section 4.8.4. For the nomenclatural assessment of the Caricetum fuscae W.KOCH 1926*, see section 4.8.7.

4.8.6 Junco-Caricetum nigrae GROSSER et al. 1967 nom. corr. KOSKA hoc loco, nom. cons. propos.

Protologue: 'Junco-Caricetum fuscae TX. (1937) 1952' (GROSSER et al. 1967: 43)
Type: GROSSER et al. (1967: tab. 16, rel. 3) [lectotypus KOSKA hoc loco]
Syn.: Caricetum goodenovii ['nigrae'] BR. [-BL.] 1915* sensu auct. p. p. [typo excl.]
Caricetum rostratae OSVALD 1923* sensu auct. p. p. [Art. 3d (Principle II Sect. 2)]
Caricetum intermediae STEFFEN 1931* nom. amb. propos. p. p. [typo excl.]
Caricetum inflato-vesicariae W.KOCH ex TX. 1937* p. min. p. [typo excl.]
Carici canescentis-Agrostietum caninae TX. 1937* p. p. [typo excl.]
Carici echinatae-Juncetum bulbosi BR.-BL. & TX. 1952* nom. rejic. propos.
Carici fuscae-Juncetum articulati BR.-BL. & TX. 1952* [Art. 3b]
Carici pseudocyperi-Menyanthetum SOÓ 1955* p. min. p. [typo excl.]
Junco-Caricetum fuscae ['(TX. 1937) TX. 1952'] PASSARGE 1964* [Art. 3d]
Carici nigrae-Potentilletum anserinae TX. ex IVIMEY-COOK & PROCTOR 1966* nom. rejic. propos.
Junco-Caricetum fuscae PASSARGE ex RYBNIČEK 1974* [Art. 31]
Ranunculo-Caricetum fuscae (TOLPA 1956) PAŁCZYŃSKI 1975
Junco effusi-Caricetum fuscae PASSARGE 1999* [Art. 5, 7]
Eleocharitetum uniglumis ALMQUIST 1929* sensu SCHUBERT et al. 2001* p. p. [Art. 3d (Principle II Sect. 2)]
Incl.: Assoziationsgruppe Junco-Caricetum fuscae sensu PASSARGE 1964*
Carici canescentis-Agrostietum caninae caricetosum paniceae TX. 1937*

Carex fusca-Potentilla anserina-[Caricion canescenti-fuscae]-Ges. sensu TX. in BR.-BL. & TX. 1952*
Lycopodium inundatum-[Eleocharition pauciflorae]-Ges. sensu PASSARGE 1964* p. p.
Preissia-Drosera rotundifolia-[Eleocharition pauciflorae]-Ges. sensu PASSARGE 1964* p. p.

Note: Since GROSSER et al. (1967) did not make an unambiguous reference to a certain syntaxon in TÜXEN, they unintentionally described a new association, and TÜXEN must not be included in its author citation, either in brackets or with 'ex'. The authors were most probably referring to the invalid name Carici fuscae-Juncetum articulati of BRAUN-BLANQUET & TÜXEN (1952: 306). We propose conserving the association name because of its more widespread use, though with different author citations (see synonyms and DIERSSEN 1985), against the earlier but unusual syntaxonomic synonyms Carici echinatae-Juncetum bulbosi BR.-BL. & TX. 1952* and Carici nigrae-Potentilletum anserinae TX. ex IVIMEY-COOK & PROCTOR 1966* (see typifications in section 4.8.7). For the reasons for correcting the name, see the Note in section 4.8.4.

4.8.7 Typifications

Caricetea fuscae OBERD. ex L.KUHN 1954*: 9:
Tofieldietalia L.KUHN 1954*: 9 [lectotypus KOSKA & TIMMERMANN hoc loco]

Parvo-Caricetea DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969*: 196 nom. cons. propos.:
Tofieldietalia PREISING ex WESTHOFF & DEN HELD 1969*: 201 [Art. 29c] (= Caricetalia davallianae BR.-BL. 1949* ex 1950*) [lectotypus KOSKA & TIMMERMANN hoc loco] – The name Caricetea fuscae OBERD. ex L. KUHN 1954* (see above) should have priority as an earlier syntaxonomic synonym. Nevertheless, we propose conserving the name of DEN HELD & WESTHOFF in WESTHOFF & DEN HELD (1969) because it has been in common use for a long time, at least in the Dutch literature (also see WESTHOFF et al. 1995), whereas the Caricetea fuscae OBERD. ex L.KUHN 1954* have not even been included in extensive synonym lists such as DIERSSEN (1982), STEINER (1993 a) or MUCINA (1997).

Sphagno-Caricetalia SUCCOW 1974*: 70
Sphagnion recurvi SUCCOW 1974*: 72 (= Caricion canescenti-nigrae NORDHAGEN ex TX. 1937* nom. corr., see 4.8.4) [lectotypus TIMMERMANN hoc loco]

Caricenalia diandrae SUCCOW 1974*: 81:
Eriophorion gracilis PREISING ex OBERD. 1957*: 159 (= Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949* nom. cons. propos.) [lectotypus KOSKA hoc loco]

Schoenenalia nigricantis PIGNATTI 1953*: 141:
Schoenion continentale PIGNATTI 1953*: 142 nom. illeg. [Art. 34a] [lectotypus KOSKA hoc loco]

Tofieldienalia PREISING ex SUCCOW 1974*: 78:
Caricion davallianae ['KLIKA 1934'] SUCCOW 1974*: 79 nom. illeg. [Art. 31] [lectotypus KOSKA hoc loco]

Caricion davallianae BR.-BL. 1950*: 357 nom. illeg. [Art. 31], non KLIKA 1934*:
Caricetum davallianae W.KOCH 1928*: 151 [lectotypus (Art. 20)] – BRAUN-BLANQUET (1949: 302) attributed the Caricion davallianae to 'KLIKA 1934' but unintentionally published a new alliance since this paper is not cited in his reference list (BRAUN-BLANQUET 1950). The correct author citation of this must, however, read 'BR.-BL. 1950' instead of 'BR.-BL. 1949' since BRAUN-BLANQUET (1949) did not publish relevés himself and the description only became valid after the publication of the reference list one year later (cf. ICPN Art. 6). BRAUN-BLANQUET (1949: 303) erroneously attributed the association name to 'KOCH 1926'. Since he made explicit reference to pages 151–156, which do not exist in KOCH (1926), it is clear that he meant KOCH (1928) which he also included in his reference list and where a valid description of the association can be found on these pages. As pointed out in Note 2 to ICPN Art. 2b, such a bibliographic error does not impair the validity of a publication. The Caricetum davallianae W.KOCH 1928* was typified by STEINER (1992: 258). The typification of the alliance presented there was necessary because the Caricion davallianae BR.-BL. 1950* had been designated as lectotype of the order Caricetalia davallianae '1949' [read: 1950; for the same reason as discussed for the alliance] by STEINER (1992: 249; the previous typification of this order with the Caricion bicolori-atrofuscae NORDHAGEN 1937* by DIERSSEN [1982: 151] was invalid).

Caricion gracilis NEUHÄUSL 1959*: 129:
Caricetum gracilis GRAEBNER & HUECK 1931*: 74 [lectotypus (Art. 20)] – By this obligatory typification (also see the typification of the type association below), this alliance name is connected with communities from mesotrophic sites. According to our classification, it would become a syntaxonomic synonym of the Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949*

nom. cons. propos. The usual application of the Caricion gracilis NEUHÄUSL 1959* (or of a suballiance name based on it) for eutraphent tall-sedge communities (e.g. BALÁTOVÁ-TULÁČKOVÁ et al. 1993; WEEDA et al. 1995) does therefore not conform with the type situation.

Eleocharition quinqueflorae PASSARGE 1978*: 156:
Eleocharito-Juncetum subnodulusi PASSARGE 1978*: 156 [lectotypus KOSKA hoc loco] – This alliance has already been described by PASSARGE (1964: 220) as 'Eleocharition pauciflorae'. However, this publication was invalid according to ICPN Art. 8 since the author only included one association group ('Ass.-Gr.: Eleocharido-Juncetum subnodulosi'; ICPN Art. 3d) and four informal communities (ICPN Art. 3c). In 1978 PASSARGE unintentionally validated his alliance by subordinating four associations, one of which being the Eleocharito-Juncetum subnodulosi which he simultaneously validated by accepting the former association group as association. The latter is the only possible choice of a lectotype because PASSARGE (1978) for the three other associations neither did include unambiguous references to their protologues nor to relevés of them.

Eriophorion gracilis PREISING ex OBERD. 1957*: 159:
Rhynchosporo-Caricetum chordorrhizae ['(PAUL & LUTZ 1941)'] OBERD. 1957*: 160 [lectotypus KOSKA hoc loco] – '(PAUL & LUTZ 1941)', as given in OBERDORFER (1957), do not form part of the correct author citation of this association since OBERDORFER did not explicitly refer to a certain basionym in PAUL & LUTZ (1941).

Schoenion continentale PIGNATTI 1953*: 142 nom. illeg. [Art. 34a]:
Schoenetum nigricanti-ferruginei (W.KOCH 1926*) PIGNATTI 1953*: 142 nom. illeg. [Art. 29c] (≡ Schoenetum nigricantis W.KOCH 1926*: 67)

Sphagnion recurvi SUCCOW 1974*: 72:
Junco effusi-Sphagnetum recurvi PASSARGE ex SUCCOW 1974*: 73 (= Carici canescentis-Agrostietum caninae TX. 1937*) [lectotypus TIMMERMANN hoc loco] – For the typification of the two associations see below.

Caricetum davallianae DUTOIT 1924*: 22:
DUTOIT (1924: tab. 4, rel. 2) [lectotypus KOSKA hoc loco]

Caricetum fuscae BEGER 1922*: 130 nom. amb. propos.:
BEGER (1922: 130, rel. 6) [lectotypus KOSKA hoc loco] – The selected type relevé belongs to the Caricion nigrae W.KOCH 1926* nom. corr. (see sect. 4.8.5), which according to our concept represents the vegetation of moderately base-rich percolated mire sites (see sect. 4.8.1). The relevés in the protologue of the Caricetum goodenovii BR. [-BL.] (1915), which is often accepted as the correct name for this association, showed a broad content that ranged into moist grassland and *Nardus stricta* swards in particular. According to our understanding, the type relevé (BRAUN 1915: p. 175, rel. 3) selected by STEINER (1992: 223) does not even belong to the class Parvo-Caricetea at all but to the Juncetum squarrosi NORDHAGEN 1922* nom. cons. propos. within the class Calluno-Ulicetea BR.-BL. & TX. ex KLIKA & HADAČ 1944*. We propose rejecting the names Caricetum fuscae [nigrae, goodenovii] with different author citations as *nomina ambigua* because they have been used in an extremely broad sense, and very often for communities from acidic or topogenous mire sites what does not conform with their nomenclatural types. The frequently-used definition by the dominance of *Carex nigra* (cf. POTT 1995) has produced an extremely broad understanding of this association. If given a narrower delimitation by the presence of *Carex canescens*, *C. echinata*, *Agrostis canina*, *Juncus filiformis* and a few others (e.g. DIERSSEN 1982; STEINER 1993a), such species combinations are typical for acidic and topogenous sites. In the typology of KOSKA & TIMMERMANN (2004), these belong to a different association and even a different alliance from the type relevés, i.e. the Caricion canescenti-nigrae NORDHAGEN ex TX. 1937* nom. corr. (see sect. 4.8.3). Instead of the two *nomina ambigua*, we propose conserving the later syntaxonomic synonyms Juncetum squarrosi NORDHAGEN 1922* for the Caricetum goodenovii BR.[-BL.] 1915* and Parnassio-Caricetum OBERD. 1957* (see further below) for the Caricetum fuscae BEGER 1922*.

Caricetum fuscae W.KOCH 1926*: 66 nom. illeg. [Art. 31]:
BEGER (1922: 130, rel. 6) [lectotypus KOSKA hoc loco] – KOCH (1926) did not include relevés of this association in his paper. Nevertheless his description is regarded as valid since he gave unambiguous reference to published relevés (ibid.: 67). One of these is here designated as lectotype. However, KOCH'S association name is a later homonym of the Caricetum fuscae BEGER 1922* (see above) and is thus illegitimate. Nonetheless, typification of this valid but illegitimate name was necessary since DIERSSEN (1980: 413) has designated it as lectotype of the Caricion fuscae W.KOCH 1926* (see sect. 4.8.5) and the latter as lectotype of the order Caricetalia fuscae W.KOCH 1926* (ibid.: 412). As a result of this typification, the Caricetalia fuscae would be an earlier syntaxonomic synonym of the Caricetalia davallianae BR.-BL. 1950* within our classification (see sect. 4.8.1). We therefore propose conserving the latter name because it is very commonly used in accordance with its type, i.e. for spring-fed percolated

mires of mesotrophic sites, whereas the name Caricetalia fuscae has often been used for markedly different vegetation types such as mires of strictly acidic and topogeneous sites and this does not conform with the type situation elucidated here.

Caricetum gracilis GRAEBNER & HUECK 1931*: 74 nom. amb. propos.:
GRAEBNER & HUECK (1931: 74, rel. 22) [lectotypus KOSKA hoc loco] – At least two of the three relevés in the protologue would belong to the class Parvo-Caricetea within our syntaxonomic system. With the typification presented here this name becomes an earlier syntaxonomic synonym of the Caricetum diandrae JONAS 1933* nom. cons. propos. Because the name Caricetum gracilis (with different author citations) has generally been used for communities from eutrophic sites which does not conform with the original diagnosis in GRAEBNER & HUECK (ibid.), we propose rejecting it as a *nomen ambiguum*. The older homonym Caricetum gracilis ALMQUIST 1929* which can also be found in the literature (e.g. STEINER 1992; BALÁTOVÁ-TULÁČKOVÁ et al. 1993; WEEDA et al. 1995) would only be valid after a successful application to the Nomenclature Commission for a *nomen conservandum* since this author followed the Uppsala school (ICPN Art. 3d in combination with Principle II Sect. 2).

Caricetum intermediae STEFFEN 1931*: 137 nom. amb. propos.:
Carex disticha 4, *Equisetum fluviatile* 3, *Lysimachia thyrsiflora* 3, *Menyanthes trifoliata* 3, *Potentilla palustris* 2, *Calamagrostis canescens* +, *Carex acuta* +, *C. rostrata* +, *Epilobium palustre* +, *Galium palustre* +, *Lysimachia vulgaris* +, *Lythrum salicaria* +, *Phalaris arundinacea* +, *Scutellaria galericulata* +, *Stellaria palustris* +, *Carex elata* r, *Rumex hydrolapathum* r; number of species: 17, Mecklenburg-Vorpommern: Recknitz valley near Kobrow – relevé taken from SUCCOW (1970: tab. 18, rel. 70 = rel. no. 22849 in the vegetation data base of Mecklenburg-Vorpommern) [neotypus KOSKA hoc loco] – In our classification, stands such as that described by STEFFEN (1931) in his synoptic table largely belong to the Parvo-Caricetea and within these mainly to the Peucedano palustris-Caricetum lasiocarpae TX. ex L. KUHN 1954* and the Junco-Caricetum nigrae GROSSER et al. 1967* nom. corr. (see sect. 4.8.6). According to our concept, the designated type relevé belongs to the first-named; the Caricetum intermediae STEFFEN 1931* thus becomes an earlier syntaxonomic synonym of it. However, the name Caricetum intermediae STEFFEN 1931* should be rejected as a *nomen ambiguum* because it has frequently been assigned by different authors to communities from nutrient-rich conditions, i.e. within the Magno-Caricion elatae W.KOCH 1926* or Caricion gracilis sensu auct., non NEUHÄUSL 1959* (e.g. BALÁTOVÁ-TULÁČKOVÁ et al. 1993; PREISING et al. 1990), which fails to conform with the orignal diagnosis and the designated type element.

Caricetum lasiocarpae DUVIGNEAUD ex VANDEN BERGHEN in LEBRUN et al. 1949*: 159 nom. illeg. [Art. 31]:
OSVALD (1923: 160, rel. 2) [lectotypus KOSKA hoc loco] – This association has been assigned to DUVIGNEAUD (1944) by VANDEN BERGHEN (in LEBRUN et al. 1949), but it was not validly published there according to ICPN Art. 7. However, it was validated unintentionally by VANDEN BERGHEN (in LEBRUN et al. 1949: 159) by including the Caricetum lasiocarpae OSVALD 1923*. The lectotype of the Caricetum lasiocarpae DUVIGNEAUD ex VANDEN BERGHEN in LEBRUN et al. 1949* is therefore selected from OSVALD (1923) and is identical with the one DIERSSEN (1982: 111) designated for the Caricetum lasiocarpae OSVALD 1923* nom. cons. propos. The two names thus become nomenclatural synonyms.

Caricetum lasiocarpae W.KOCH 1926*: 83:
KOCH (1926: tab. 9, rel. 8) [lectotypus KOSKA hoc loco] – This name thus becomes a syntaxonomic synonym of the Caricetum lasiocarpae OSVALD 1923* which is a name of the Uppsala school and should be conserved because of its widespread use (e.g. DIERSSEN 1982; STEINER 1993 a; POTT 1995; RENNWALD 2002), according to ICPN Art. 52 in combination with Principle II, Sect. 2.

Carici canescentis-Agrostietum caninae TX. 1937*: 62 (≡ Carici canescentis-Agrostietum caninae caricetosum inflatae TX. 1937*: 62):
Sphagnum recurvum agg. [*Sphagnum recurvum*] 5, *Potentilla palustris* 4, *Carex rostrata* 2, *Calliergon stramineum* 2, *Agrostis canina* 1, *Agrostis capillaris* 1, *Carex canescens* 1, *Eriophorum angustifolium* 1, *Glyceria maxima* +, *Iris pseudacorus* +, *Lysimachia thyrsiflora* +, *Menyanthes trifoliata* +, *Peucedanum palustre* +, *Typha latifolia* +; number of species: 14, NW Germany – Relevé kindly supplied by the Tüxen archive, Hannover (handwritten table no. 18, rel. 3). This relevé is one of the seven on which TÜXEN (ibid.) based the synoptic table in the protologue of the subassociation [the relevé numbers given for the two subassociations in TÜXEN (ibid.) have been mixed up in the book (A. HOPPE, pers. comm.), i.e. actually there were seven relevés of the Carici-Agrostietum caricetosum inflatae and 32 of the Carici-Agrostietum caricetosum paniceae] [neotypus TIMMERMANN hoc loco] – The designated neotype thus conforms with ICPN Recomm. 21A. The chosen relevé seems not optimal as type due to the

relatively low cover-abundance values of *Carex canescens* and *Agrostis canina* but it was the best one available. In all the other six relevés either one of the name-giving species is missing or species from base-rich or eutrophic habitats are even more frequent.

Carici echinatae-Juncetum bulbosi BR.-BL. & TX. 1952*: 309:
BR.-BL. & TX. (1952: tab. 36, rel. 188) [lectotypus KOSKA hoc loco] – This name thus becomes an earlier syntaxonomic synonym of the Junco-Caricetum nigrae GROSSER et al. 1967* nom. corr. We propose that the latter should be conserved because of its more widespread use (see sect. 4.8.6).

Carici nigrae-Potentilletum anserinae TX. ex IVIMEY-COOK & PROCTOR 1966*: 258:
IVIMEY-COOK & PROCTOR (1966: tab. 35, rel. 175) [lectotypus KOSKA hoc loco] – This name is a validation of the '*Carex fusca-Potentilla anserina*-Ges. TX.' (= Carici fuscae-Juncetum articulati BR.-BL. & TX. 1952 nom. inval. [Art. 3b]) previously described by BRAUN-BLANQUET & TÜXEN (1952). With the typification presented here, the name becomes an earlier syntaxonomic synonym of the Junco-Caricetum nigrae GROSSER et al. 1967* nom. corr. We propose that the latter should be conserved because of its more widespread use (see sect. 4.8.6).

Carici pseudocyperi-Menyanthetum SOÓ 1955*: 307:
Menyanthes trifoliata 4, *Carex acuta* 2, *Equisetum fluviatile* 2, *Brachythecium* cf. *rutabulum* 1, *Calliergon giganteum* 1, *Galium palustre* subsp. *palustre* 1, *Drepanocladus aduncus* 1, *Lysimachia thyrsiflora* 1, *Ranunculus lingua* 1, *Carex elata* +, *C. pseudocyperus* +, *C. rostrata* +, *Epilobium palustre* +, *Lythrum salicaria* +, *Stellaria palustris* +, *Calamagrostis stricta* r, *Caltha palustris* r, *Rumex hydrolapathum* r, *Typha latifolia* r; number of species: 19, Mecklenburg-Vorpommern: Trebel valley near Carlsthal – relevé taken from SUCCOW (1970: tab. 18, rel. 439, named 'Menyantho-Magnocaricetum' = rel. no. 22838 in the vegetation data base of Mecklenburg-Vorpommern) [neotypus KOSKA hoc loco] – The name thus becomes a syntaxonomic synonym of the Caricetum diandrae JONAS 1933*.

Cladietum marisci ALLORGE 1921*: 626:
Cladium mariscus 5, *Phragmites australis* 1, *Carex lasiocarpa* +, *C. elata* +, *Lythrum salicaria* +, *Mentha aquatica* +, *Thelypteris palustris* +, *Salix cinerea* (S) +; number of species: 8, Switzerland: Hausersee near Zürich – relevé taken from ZOBRIST (1935: tab. 1 rel. 5) [neotypus KOSKA hoc loco] – The assessment of this association name as a *nomen nudum* by BALÁTOVÁ-TULÁČKOVÁ et al. (1993) is unfounded. ALLORGE (1921) published a synoptic table which before 1979 was sufficient for an original diagnosis. The different evaluation of BALÁTOVÁ-TULÁČKOVÁ et al. was probably caused by the fact that ALLORGE used letters (RR, R, PC, C, CC) instead of numbers to mark different degrees of constancy, but this is not prohibited by the ICPN. DIERSSEN (1982: 86) previously selected the entire synoptic table of ALLORGE as 'type' of the association but this was invalid according to ICPN Art. 21. With the typification presented here, this association becomes homotypic with the Mariscetum serrati ZOBRIST 1935* (see below).

Eleocharito-Juncetum subnodulosi PASSARGE 1978*: 156:
Juncus subnodulosus 4, *Calliergonella cuspidata* 2, *Eleocharis quinqueflora* 2, *Juncus articulatus* 2, *Carex viridula* subsp. *viridula* 1, *Phragmites australis* 1, *Cladium mariscus* +, *Epipactis palustris* +, *Liparis loeselii* +, *Lythrum salicaria* +, *Mentha aquatica* +, *Triglochin palustre* +, additional species without cover-abundance values: *Alisma plantago-aquatica*, *Carex elata*, *Galium palustre*; number of species: 15, relevé area: 5 m^2, Mecklenburg-Vorpommern: lake shore near Fürstensee, c. 10 km east of Neustrelitz – relevé taken from PASSARGE (in SCAMONI 1963: tab. 29, rel. 2, named 'Juncetum subnodulosi') [neotypus KOSKA hoc loco] – This association name was first used by PASSARGE (1964: 220) for an association group, but this cannot be considered as a valid description of an assocation according to ICPN Art. 3d (see also comments on the Eleocharition quinqueflorae PASSARGE 1978* above).

Juncetum alpini PHILIPPI 1960* corr. GÖRS 1977*: 268 (original name: Juncetum alpino-articulati PHILIPPI 1960*: 179):
BRAUN (1968: tab. 47, rel. 4) [neotypus KOSKA hoc loco] – The correction of the name by GÖRS (1977) was in accordance with ICPN Art. 43 since *Juncus alpinarticulatus* auct., non CHAIX is a pseudonym of *J. alpinus* VILL. (cf. WIßKIRCHEN & HAEUPLER 1998: 275).

Junco effusi-Sphagnetum recurvi PASSARGE ex SUCCOW 1974*: 73:
Sphagnum recurvum agg. [*S. recurvum*] 5, *Agrostis canina* 2b, *Potentilla palustris* 2b, *Carex rostrata* 1, *Juncus effusus* 1, *Viola palustris* 1, *Calla palustris* +, *Calliergon stramineum* +, *Carex canescens* +, *C. nigra* +, *Cirsium palustre* +, *Epilobium palustre* +, *Eriophorum angustifolium* +, *Lysimachia thyrsiflora* +, *Menyanthes trifoliata* +, *Thelypteris palustris* +; number of species: 16, Mecklenburg-Vorpommern: peatland near lake Müritz – relevé taken from JESCHKE (1959: tab. 24, rel. 5) [neotypus TIMMERMANN hoc loco] – The association name is based on the invalid '*Sphagnum-Juncus effusus*-Ges.' of PASSARGE (1964: 216; ICPN Arts. 3b, 3c). By the typification given here, it becomes a syntaxonomic syno-

nym of the Carici canescentis-Agrostietum caninae TX. 1937* (see above).

Mariscetum serrati ZOBRIST 1935*: 18:
ZOBRIST (1935: tab. 1, rel. 5) [lectotypus KOSKA hoc loco] – This name thus becomes a syntaxonomic as well as a nomenclatural synonym of the Cladietum marisci ALLORGE 1921* (see above).

Parnassio-Caricetum OBERD. 1957*: 169 nom. cons. propos.:
Blysmus compressus 2, *Carex nigra* 2, *Carex demissa* [*C. tumidicarpa*] 2, *Climacium dendroides* 2, *Warnstorfia exannulata* [*Drepanocladus exannulatus*] 2, *Nardus stricta* 2, *Philonotis fontana* 2, *Potentilla erecta* 2, *Carex echinata* 1, *C. panicea* 1, *Epilobium palustre* 1, *Eriophorum angustifolium* 1, *Luzula campestris* 1, *Parnassia palustris* 1, *Viola palustris* 1, *Campylium stellatum* +, *Drepanocladus revolvens* agg. [*D. revolvens*] +, *Drosera rotundifolia* +, *Galium uliginosum* +, *Aneura* [*Riccardia*] *pinguis* +, *Valeriana dioica* +; number of species: 22, relevé area: 1 m^2, Baden-Württemberg: Black Forest, 955 m a. s. l. – relevé taken from DIERSSEN & DIERSSEN (1984: tab. 13a, rel. 6, named 'Campylio-Caricetum dioicae') [neotypus KOSKA hoc loco] – In compliance with ICPN Recomm. 21A, the neotype is chosen from the same geographic area (Black Forest) from which the relevés of the synoptic table in the protologue of the association originated. By the typification presented here the association becomes a later syntaxonomic synonym of the Caricetum fuscae BEGER 1922*. However, all associations named Caricetum fuscae [nigrae, goodenovii] described by various authors should be rejected as *nomina ambigua* because of their variable use in the literature which often excluded their types (see above). Instead of the Caricetum fuscae BEGER 1922*, we propose conserving the Parnassio-Caricetum OBERD. 1957* since this name has a much more clearly delimited content and has also frequently been used in the literature (e.g. PHILIPPI & GÖRS 1977; RENNWALD 2002).

Peucedano palustris-Caricetum lasiocarpae PAUL & LUTZ 1941*: 12 nom. invers. propos. (original form '*Carex lasiocarpa-Peucedanum palustre*-Ass.'):
PAUL & LUTZ (1941: tab. 2, rel. 7) [lectotypus KOSKA hoc loco] – This is the first valid publication of the association since TÜXEN (1937), to whom the authors attributed it, gave only a provisional description (ICPN Art. 3b). The inversion of the name is proposed following ICPN Art. 42, since *Carex* in the relevés of the original diagnosis is more frequent and has a much higher coverage than *Peucedanum*. According to our understanding, this association inhabits mesotrophic to slightly eutrophic sites, particularly under moderately base-rich conditions, and is different from the Caricetum lasiocarpae OSVALD 1923* nom. cons. propos. representing conditions of lower nutrient availability (expressed by species such as *Carex limosa, Rhynchospora alba, Sphagnum contortum* and *Scorpidium scorpioidis*). Our delimitation of the Peucedano palustris-Caricetum lasiocarpae therefore corresponds to that in TÜXEN (1937) and BALÁTOVÁ-TULÁČKOVÁ (1972), but is narrower than that in PAUL & LUTZ (1941).

Primulo-Schoenetum OBERD. 1957*: 177
BRAUN (1968: tab. 38, rel. 5) [neotypus KOSKA hoc loco] – In the first edition of the 'Süddeutsche Pflanzengesellschaften', OBERDORFER (1957: 177) clearly included relevés of the Junco subnodulosi-Schoenetum nigricantis ALLORGE 1921* nom. invers. et mut. propos. and the Schoenetum ferruginei DU RIETZ 1925* nom. cons. propos. in the synoptic table of the original diagnosis of this association. In the second edition of the book, GÖRS (1977: 250) then presented an emended version of the association by restricting it more or less to stands with *Schoenus ferrugineus*, an interpretation of the name that has been followed by subsequent authors. The neotype selected here conforms with this practice. However, following ICPN Art. 52 in combination with Principle II Sect. 2, we propose conserving the earlier name Schoenetum ferruginei DU RIETZ 1925* of the Uppsala school since it has a much more clearly delimited content.

Rhynchosporetum albae W.KOCH 1926*: 93 (≡ Rhynchosporetum albae typicum W.KOCH 1926*: 93)
W.KOCH (1926: 94) [lectotypus KOSKA hoc loco] – Following ICPN Art. 19a, Sect. 2, this is the only possible typification since the author published one relevé for each of the two subassociations that he recognised (typicum and trichophoretosum alpini). Within our classification, the association thus becomes a syntaxonomic synonym of the Caricetum lasiocarpae OSVALD 1923*, which is a name of the Uppsala school and should be established in its place, following ICPN Art. 52 in combination with Principle II Sect. 2, because of its widespread use in accordance with its type. Moreover, with the obligatory typification of the association given here, the Rhynchosporion albae W.KOCH 1926* as whose type it has been designated by STEINER (1992: 160; the previous typification with the Caricetum limosae W.KOCH 1926* by DIERSSEN [1982: 96] was invalid according to ICPN Art. 20) becomes an earlier syntaxonomic synonym of the Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949* within our syntaxonomic system. KOCH (1926) himself described the strong spatial and floristic connections of his Rhynchosporion albae with his Caricetum lasiocarpae. However, the Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949* is a very

commonly used name and should be conserved against the Rhynchosporion albae W.KOCH 1926*. We propose this because the name 'Rhynchosporion albae' has very often been used in the literature for a different kind of vegetation, i.e. that of more acidic and more oligotrophic environments than the Caricion lasiocarpae (e.g. JASNOWSKA & JASNOWSKI 1983; SCHAMINÉE et al. 1995c). The correct name for these parts of the Rhynchosporion albae sensu auct. is Scheuchzerion palustris NORDHAGEN ex TX. 1937* (see sect. 4.7.5). In classifications largely based on dominant species, the names Rhynchosporion albae W.KOCH 1926* and Caricion lasiocarpae VANDEN BERGHEN in LEBRUN et al. 1949* can indeed be correct names for different alliances (e.g. DIERSSßEN 1982; STEINER 1992).

Schoenetum nigricantis W.KOCH 1926*: 67 (≡ Schoenetum nigricantis typicum W.KOCH 1926*: 70 ≡ Schoenetum nigricanti-ferruginei [W.KOCH 1926*] PIGNATTI 1953*: 142 nom. illeg. [Art. 29a]):
KOCH (1926: tab. 7, rel. 3) [lectotypus KOSKA hoc loco] – This name thus becomes a syntaxonomic synonym of the Junco subnodulosi-Schoenetum nigricantis ALLORGE 1921* nom. invers. et mut. propos.

Scorpidio-Caricetum elatae BRAUN 1968* nom. mut. propos.: 29 (original form: Scorpidio-Caricetum dissolutae):
BRAUN (1968: tab. 13, rel. 6) [lectotypus KOSKA hoc loco] – BRAUN (1968) himself described a forma *'dissoluta'* of *Carex elata* with flat and scarcely domed hummocks. He gave it the status of a character taxon but its taxonomic relevance is doubtful. Following ICPN Art. 45, we propose changing the association name as presented above since *Carex elata* f. *dissoluta* has not been recognised in Central European standard floras of the last 20 years.

Sphagno recurvi-Caricetum rostratae STEFFEN 1931*: 156:
STEFFEN (1931: tab. 21, rel. 6) [lectotypus TIMMERMANN hoc loco]

4.9 Phragmito-Magno-Caricetea KLIKA in KLIKA & V.NOVÁK 1941[6]

4.9.1 General concept (I. KOSKA)

This class describes the luxuriantly growing reed-, sedge- and tall herb-vegetation under nutrient-rich wet to moist conditions, which is little influenced by human mowing or grazing activities. The version of the class given in KOSKA (2004) follows the same fundamental concept as described for the Parvo-Caricetea DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969* nom. cons. propos. (see sect. 4.8). The former dominance-concept of associations has been rejected in favour of an improved indication value of the principal syntaxonomic levels referring to site conditions. We therefore understand many of the former dominance-associations as facies. In spite of a fundamental conformity with recent proposals for Central Europe (e.g. PHILIPPI 1977; BALÁTOVÁ-TULÁČKOVÁ et al. 1993; JULVE 1993; POTT 1995; WEEDA et al. 1995; DIERSSEN 1996; SCHUBERT et al. 2001; RENNWALD 2002), our syntaxonomic system thus also shows some significant differences.

As far as the delimitation of the class is concerned, the most important changes are the following: Facies of tall sedges, reed and other wetland grasses with a relevant share of mesotraphent species are moved to the Parvo-Caricetea (see sect. 4.8). Reed stands showing a significant influence of haline water quality are classified within the Juncetea maritimi TX. & OBERD. 1958* (see sect. 4.10). Finally, the tall herb vegetation of the alliances Filipendulo-Petasition BR.-BL. ex DUVIGNEAUD 1949* (= Filipendulion LOHMEYER in OBERD. et al. 1967* nom. inval. [Art. 8]), Archangelicion litoralis SCAMONI & PASSARGE 1963* (= Calystegion sepium sensu auct., non TX. 1947* nom. amb. propos.) and Senecionion fluviatilis TX. ex MOOR 1958* is joined with the Phragmito-Magno-Caricetea. The affiliation of these alliances to classes has been in dispute for a long time (e.g. DOING 1963; DIERSCHKE 1996; VAN'T VEER et al. 1999). Together with wetland stands of drier habitats that are usually classified within the Phragmito-Magno-Caricetea, these alliances show noteworthy similarities. Some authors have combined them into a separate new class Filipendulo-Convolvuletea GÉHU & GÉHU-FRANCK 1987* nom. inval. [Art. 8][7] (GÉHU & GÉHU-FRANCK 1987; JULVE 1993; VAN'T VEER et al. 1999) or have classi-

[6] Concerning the spelling with two hyphens instead of one, see footnote 5.

[7] The assessment of this class name as valid by THEURILLAT & MORAVEC (1990a: 86) is unfounded since GÉHU & GÉHU-FRANCK (1987) did not cite the references of the protologues of the included two orders or of any of the subordinate syntaxa mentioned.

fied them within the class Artemisietea vulgaris LOHMEYER et al. ex VON ROCHOW 1951* and the order Calystegietalia sepium TX. ex MOOR 1958* nom. mut. propos. respectively (DIERSSEN 1996). We do not favour the former solution, because this class would then have too few character species. On the other hand, we found a higher floristic similarity of all these alliances with the Phragmito-Magno-Caricetea rather than with the Artemisietea vulgaris or with the Molinio-Arrhenatheretea TX. 1937*, where the Filipendulion is usually placed (Table 1). Moreover, the three alliances show high floristic similiarities among themselves (Czekanowski indices between 0,36 und 0,60), which supports their fusion into one syntaxon.

In KOSKA (2004) the class is divided into four orders, largely reflecting different hydrological conditions: Phragmitetalia australis W.KOCH 1926* for wet topogenous or fluvial sites (flat mires, riparian zones), Nasturtio officinalis-Glycerietalia fluitantis PIGNATTI 1953* for partly submerged vegetation in rapidly flowing small streams, Scrophulario umbrosae-Caricetalia paniculatae ord. nov. for wet spring mires and similar sites (see sect. 4.9.2), and Calystegietalia sepium TX. ex MOOR 1958* nom. cons. et mut. propos. (for the name see Note in sect. 4.9.3) for communities of tall herbs or wetland grasses on moist fallow land. The first two orders are in common use, the third has not previously been separated from the first, and the alliances of the fourth have been included in other classes by most authors (e.g. POTT 1995; RENNWALD 2002). The Calystegietalia sepium have few character species and can be connected to the class as the central order. Like PIGNATTI (1953) and DIERSSEN (1996), we found only one alliance Glycerio-Sparganion BR.-BL. & SISSINGH in BOER 1942* within the Nasturtio officinalis-Glycerietalia fluitantis and also one within the Scrophulario-Caricetalia paniculatae (see sect. 4.9.2, 4.9.7). The Phragmitetalia are divided into three alliances. The Phragmition communis W.KOCH 1926* represents the core, from which the pioneer-like vegetation of the Eleocharito palustris-Sagittarion sagittifoliae PASSARGE 1964* from fluvial shores and of the Phalarido arundinaceae-Glycerion PASSARGE 1964* from marshes and lake shores with fluctuating water levels or other mechanical disturbances such as waves are conspicuously different. As only the Eleocharito palustris-Sagittarion sagittifoliae contains a good number of character species, we distinguished two suborders to make this division possible according to our methodology (see sect. 2.4). The first one, Phragmitenalia australis subord. nov. (see sect. 4.9.6), contains only the Phragmition communis. In contrast to the general approach, we have not accepted the separation of the Magno-Caricion elatae W.KOCH 1926* from the Phragmition communis: the weak floristic

Table 1
Comparison of the floristic similarity of the Calystegietalia sepium, the Filipendulo-Petasition, the Archangelicion litoralis and the Senecionion fluviatilis with the Phragmito-Magno-Caricetea, the Molinio-Arrhenatheretea and the Artemisietea vulgaris. The similarity is expressed by the Czekanowski index (see DIERSCHKE 1994), which ranges from 0 to 1 and expresses the mean share of concordant species relative to the mean species number of the syntaxa. The calculation is based on the 'constancy reference values' of the species within the syntaxa in the whole data set of Mecklenburg-Vorpommern. These are defined as means of the constancy values of the included associations (see DENGLER & BERG 2002, 2004). The values of the Phragmito-Magno-Caricetea are calculated by subtraction of the syntaxon being compared. The values of the Molinio-Arrhenatheretea and the Artemisietea vulgaris are calculated in all cases without including the Filipendulo-Petasition, the Archangelicion litoralis and the Senecionion fluviatilis. The closest floristic relationships are marked by underlining the respective values

	Phragmito-Magno-Caricetea	Molinio-Arrhenatheretea	Artemisietea vulgaris
O. Calystegietalia sepium	0,40	0,37	0,30
All. Filipendulo-Petasition	0,44	0,38	0,28
All. Archangelicion litoralis	0,57	0,34	0,24
All. Senecionion fluviatilis	0,34	0,27	0,26

differences of reed- and tall sedge vegetation led us to reject this separation which is largely justified physiognomically (see KOSKA 2004). It was also a result of our methodological approach, which demands stronger differential criteria for separating syntaxa. The second suborder, Oenanthenalia aquaticae subord. nov. (see sect. 4.9.5), shows fewer character species of its own rank and is thus interpreted as a central syntaxon. It combines the Eleocharito palustris-Sagittarion sagittifoliae and the central alliance Phalarido arundinaceae-Glycerion and thus comes close to the concept of the order Oenanthetalia aquaticae HEJNÝ in KOPECKÝ & HEJNÝ 1965* nom. inval. [Art. 8]. Because of the strong floristic connection with the Phragmition, it does not seem appropriate to raise this suborder to order level. In a similar way and for similar reasons the Calystegietalia are divided into the two suborders, Filipendulenalia ulmariae subord. nov. (see sect. 4.9.4) and Calystegienalia sepium subord. nov. (see sect. 4.9.3), to allow a separation of the three alliances included (see above).

4.9.2 Scrophulario umbrosae-Caricetalia paniculatae KOSKA ord. nov. hoc loco

This order describes the vegetation of inclined and intensely percolated nutrient-rich spring mires and similar sites. Such stands are often dominated by *Carex paniculata* and comprise more species than the spring vegetation of the Montio-Cardaminetea BR.-BL. & TX. ex KLIKA 1948*. Compared to the reed and tall sedge stands of topogenous mires and riparian zones which we classify within the Phragmitetalia australis W.KOCH 1926*, the special feature of this new order is the almost complete absence of the well-known 'character species' of the Phragmitetalia, the Phragmition communis W.KOCH 1926*, and even many of the Magno-Caricion elatae W.KOCH 1926* of traditional classifications as well as a conspicuously high level of species diversity. This is also the reason for separating it on a higher syntaxonomic level, although we could only find one alliance and one association within Mecklenburg-Vorpommern. Unlike the vegetation of mesotrophic spring mires (Caricion davallianae KLIKA 1934*), the eutraphent occurrences had not been taken into account as formal syntaxa, until SUCCOW (in KNAPP et al. 1985) proposed a separate association. Nevertheless they have been recognised for a long time (e.g. HÖHN 1936; MAAS 1959; SUCCOW 1970). But until now communities of this type have usually been placed within the Magno-Caricion, and stands dominated by *Phragmites* also within the Phragmition (e.g. STEINER 1992; BALÁTOVÁ-TULÁČKOVÁ et al. 1993; DIERSSEN & DIERSSEN 2001).

Type: Scrophulario umbrosae-Caricion paniculatae all. nov. (see sect. 4.9.7) [holotypus hoc loco]
Syn.: Phragmitetalia W.KOCH 1926* sensu auct. p. min. p. [typo excl.]
Magno-Caricetalia PIGNATTI 1953* sensu auct. p. min. p. [typo excl.]
C: *Carex paniculata, Rumex aquaticus* (transgr., terr.)*, Scrophularia umbrosa* (transgr., terr.)
D: *Angelica sylvestris, Cirsium palustre, Equisetum palustre, Galium uliginosum, Geum rivale, Hypericum tetrapterum, Juncus subnodulosus, Plagiomnium elatum, Scirpus sylvaticus, Silene flos-cuculi, Valeriana dioica, V. officinalis*
D (joint with Phragmitetalia australis): *Epilobium palustre, Equisetum fluviatile, Lemna minor, Typha latifolia*
D (joint with Nasturtio officinalis-Glycerietalia fluitantis): *Cardamine amara*
D (joint with Calystegietalia sepium): *Cirsium oleraceum, Festuca rubra* agg., *Filipendula ulmaria, Galium aparine, Urtica dioica*
D (joint with Phragmitetalia australis and Nasturtio officinalis-Glycerietalia fluitantis): *Berula erecta*
D (joint with Phragmitetalia australis and Calystegietalia sepium): *Galium palustre, Lysimachia vulgaris, Lythrum salicaria, Phragmites australis*

4.9.3 Calystegienalia sepium (TX. ex MOOR 1958) KOSKA subord. nov. hoc loco

Following the approach of MÜLLER (1983) for the order Convolvuletalia sepium TX. 1950* nom. inval. [Art. 8], this suborder combines the central alliance Archangelicion litoralis SCAMONI & PASSARGE 1963* (= Calystegion sepium sensu auct., non TX. 1947* nom. amb. propos.) with the Senecionion fluviatilis TX. ex MOOR 1958*. It is characterised by a highly productive tall herb- and tall grass-vegetation and by moist to sometimes flooded site conditions. The communities of the Senecionion occur along large rivers with long periods of

flooding and strong fluctuations in water level, and have a particularly high share of specialised 'river valley plants'. The stands of the Archangelicion occur in similar places on smaller rivers or in the estuarine range of large rivers as well as on any kind of moist flat land or depression with stagnant water or periodical flooding of a moderate amplitude. In general they have a significantly smaller share of 'river valley plants'. A remarkable exception are *Angelica archangelica* and *Sonchus palustris*, both being association character species, which are especially frequent in the lowlands near the sea shore. The suborder covers the usual content of Calystegietalia sepium TX. ex MOOR 1958* nom. cons. et mut. propos. and additionally includes some species combinations which so far have been classified within the Filipendulo-Petasition BR.-BL. ex DUVIGNEAUD 1949* (= Filipendulion LOHMEYER in OBERD. et al. 1967* nom. inval. [Art. 8]) or the Phragmitetalia communis W.KOCH 1926*. The special features of the former have been acknowledged by PASSARGE (1978) and DIERSCHKE (1996), who grouped them in the suballiance Veronico-Lysimachienion vulgaris PASSARGE 1977*, and also by KLAUCK (1993), who distinguished a separate alliance Symphyto officinalis-Filipendulion KLAUCK 1993* (see also PREISING et al. 1997). Many authors do not follow the approach of MÜLLER (1983) and instead include the Archangelicion within the Senecionion (e.g. MUCINA 1993; VAN'T VEER et al. 1999; SCHUBERT et al. 2001). It is noteworthy that all the associations of wetland tall herb-vegetation from the Netherlands presented by VAN'T VEER et al. (1999) come close to our Archangelicion (see KOSKA 2004) in terms of their species combination.

Protologue: 'Convoluletalia sepii TX. 1950' (MOOR 1958: 230)
Type: Senecionion fluviatilis TX. ex MOOR 1958*: 230 [holotypus (Art. 27a)]
Incl.: Convolvuletalia sepium TX. 1950* [Art. 8]
C: *Barbarea stricta* (terr.), *Calystegia sepium* (transgr.), *Euphorbia palustris, Senecio sarracenicus, Sonchus palustris, Symphytum officinale*
D: *Achillea ptarmica, Atriplex prostrata, Bidens frondosa, Carex acuta, Iris pseudacorus, Oenanthe aquatica, Plantago major, Poa palustris, Solanum dulcamara, Stachys palustris, Tanacetum vulgare, Thalictrum flavum*
Note: The name form of the basionym should be altered from Convolvuletalia sepium TX. ex MOOR 1958* to Calystegietalia sepium TX. ex MOOR 1958* nom. mut. propos. because the name *Convolvulus sepium* instead of *Calystegia sepium* has not been used for the name-giving species in the most important taxonomic and floristic literature of the last 20 years. The suborder name is therefore already formed on the basis of this proposal. The Calystegietalia sepium are a later syntaxonomic synonym of the order Artemisietalia vulgaris TX. 1947* whose type is the Calystegion sepium TX. 1947* (DENGLER & WOLLERT in DENGLER et al. 2003: 618). However, following ICPN Art. 52, we propose establishing the name Calystegietalia sepium as a *nomen conservandum* and rejecting the name Artemisietalia vulgaris as a *nomen ambiguum* because the latter has been used in contradiction to its type all through the syntaxonomic literature. DENGLER (2002: 66) therefore published the new order name Arctio lappae-Artemisietalia vulgaris DENGLER 2002* to replace the pseudonym Artemisietalia vulgaris sensu auct., non TX. 1947*.

4.9.4 Filipendulenalia ulmariae DE FOUCAULT & GÉHU ex KOSKA subord. nov. hoc loco

This suborder represents a 'core version' of the former Filipendulo ulmariae-Petasition hybridi BR.-BL. ex DUVIGNEAUD 1949* (= Filipendulion LOHMEYER in OBERD. et al. 1967* nom. inval. [Art. 8]) and consists of only one alliance within our region which is the emended Filipendulo ulmariae-Petasition hybridi. Unlike the Calystegienalia sepium subord. nov. (see sect. 4.9.3), this tall herb- and tall grass-vegetation is only seldom influenced by flooding because the ground of its stands is often more or less inclined and groundwater often percolates through the soils. A similar grouping has been suggested by PASSARGE (1977, 1978) and DIERSCHKE (1996), who proposed the comparable suballiance Angelico-Filipendulenion ulmariae PASSARGE 1977*, and also by KLAUCK (1993), who described the separate alliance Cirsio palustris-Filipendulion ulmariae

KLAUCK 1993* (similarly in PREISING et al. 1997). However, most authors maintain a broader conception of the 'Filipendulion', include parts of our second suborder, Calystegienalia sepium (e.g. POTT 1995; DIERSSEN 1996), and subordinate it to the class Molinio-Arrhenatheretea TX. 1937*. At least for Mecklenburg-Vorpommern, no species could be found that is more or less restricted to the Filipendulenalia ulmariae. All are spreading into other orders and classes, especially the Phragmitetalia W.KOCH 1926*, the Scrophulario umbrosae-Caricetalia paniculatae ord. nov. (see sect. 4.9.7), the Parvo-Caricetea WESTHOFF ex DEN HELD & WESTHOFF in WESTHOFF & DEN HELD 1969* nom. cons. propos., the Molinio-Arrhenatheretea and the Artemisietea vulgaris LOHMEYER et al. ex VON ROCHOW 1951*. Even 'classical' character species such as *Filipendula ulmaria*, *Geranium palustre* and *Valeriana officinalis* agg. do not meet the character species criterion at suborder level within the vegetation data base of Mecklenburg-Vorpommern (cf. BERG et al. 2001). This suborder and its alliance are therefore the most 'central' of the class Phragmito-Magno-Caricetea and at the same time are subject to strong influences from the other classes mentioned, especially from the Molinio-Arrhenatheretea (see Table 1).

Type: Filipendulo ulmariae-Petasition hybridi BR.-BL. ex DUVIGNEAUD 1949*: 106 [holotypus hoc loco]
Incl.: Filipenduletalia DE FOUCAULT & GÉHU 1980* p. p. [Art. 3b, 8]
C: [to be dropped because it is the central suborder within the order]
D: *Aegopodium podagraria, Anthriscus sylvestris, Arrhenatherum elatius, Carex acutiformis, Cirsium oleraceum, Equisetum palustre, Filipendula ulmaria, Heracleum sphondylium, Lathyrus pratensis*

4.9.5 Oenanthenalia aquaticae HEJNÝ ex KOSKA subord. nov. hoc loco

Like the concept of KOPECKÝ & HEJNÝ (1965) and BALÁTOVÁ-TULÁČKOVÁ et al. (1993), who support a separate order Oenanthetalia aquaticae HEJNÝ in KOPECKÝ & HEJNÝ 1965* nom. inval. [Art. 8], this suborder describes a pioneer-like vegetation which is influenced by natural or human mechanical disturbances or strong water level fluctuations (see sect. 4.9.1). It thus has transitional features between the Phragmition communis W.KOCH 1926* and the class Bidentetea TX. et al. ex VON ROCHOW 1951*, often with a noticeable share of species from both, whilst the dominant species are often rapidly developing perennials such as *Alisma plantago-aquatica* or *Phalaris arundinacea*. Most other authors so far have included the communities of the suborder in a broadly defined Phragmition, and to a smaller extent also in the Magno-Caricion elatae W.KOCH 1926*. The subdivision into the Eleocharito palustris-Sagittarion sagittifoliae PASSARGE 1964* and the central alliance Phalarido arundinaceae-Glycerion PASSARGE 1964* proposed in KOSKA (2004) is based on the high proportion of special species such as the 'river valley plants' (e.g. *Butomus umbellatus*) and the 'rheophilic' species (e.g. *Berula erecta*) occurring in the stands of the Eleocharito palustris-Sagittarion sagittifoliae. This classification is not derived from KOPECKÝ & HEJNÝ (1965), but was implied by PASSARGE (1964). However, PASSARGE (as WEEDA et al. 1995) included both alliances in the Nasturtio-Glycerietalia PIGNATTI 1953* and did not clearly discriminate between communities in flowing water and those in stagnant water.

Type: Phalarido arundinaceae-Glycerion PASSARGE 1964* [holotypus hoc loco]
Incl.: Oenanthetalia aquaticae HEJNÝ in KOPECKÝ & HEJNÝ 1965* [Art. 8]
C: *Alisma plantago-aquatica, Apium repens* (terr.), *Rorippa amphibia* (transgr.)
D: *Agrostis stolonifera, Bidens cernua, B. tripartita, Glyceria fluitans, Juncus articulatus, J. effusus, Oenanthe aquatica, Ranunculus repens, R. sceleratus*

4.9.6 Phragmitenalia australis (W.KOCH 1926) KOSKA stat. nov. hoc loco

This suborder represents a 'core version' of the usually more broadly defined Phragmitetalia australis W.KOCH 1926*, as was first proposed by KOPECKÝ & HEJNÝ (1965) through exclusion of the alliances Oenanthion aquaticae HEJNÝ 1948 nom. inval. [Art. 1] (= Phalarido arundinaceae-Glycerion PASSARGE 1964*), Eleocharito palustris-Sagittarion sagittifoliae PASSARGE 1964* (then summarised under the Oenanthion) and Glycerio-Sparganion BR.-BL.

& SISSINGH in BOER 1942*. This core stands for the vegetation of topogenous mires, lake shores and the like, which is rarely disturbed and is influenced by moderate fluctuations in water level. This version is now represented mainly by BALÁTOVÁ-TULÁČKOVÁ et al. (1993) and WEEDA et al. (1995). Since the Magno-Caricion elatae W.KOCH 1926* is not separated from the Phragmition communis W.KOCH 1926* (see sect. 4.9.1) according to our concept, there is no further subdivision of the suborder into different alliances.

Protologue: 'Phragmitetalia' (KOCH 1926: 20)
Type: Phragmition communis W.KOCH 1926*: 45 [holotypus (Art. 27a); lectotypus (Art. 20) for the order Phragmitetalia australis W.KOCH 1926*]
C: *Carex pseudocyperus* (transgr.), *Cicuta virosa, Rumex hydrolapathum* (transgr.), *Typha angustifolia* (transgr.)
D: *Carex paniculata, C. rostrata, Hydrocharis morsus-ranae, Lysimachia thyrsiflora, Peucedanum palustre, Ranunculus lingua, Thelypteris palustris*

4.9.7 Scrophulario umbrosae-Caricion paniculatae KOSKA all. nov. hoc loco

Within the Scrophulario umbrosae-Caricetalia paniculatae ord. nov. (see sect. 4.9.2), only this alliance with its type association as the sole association occurs in Mecklenburg-Vorpommern.

Type: Valeriano-Caricetum paniculatae (WANGERIN ex JESCHKE 1964*) SUCCOW in KNAPP et al. 1985*: 65 (basionym: Caricetum paniculatae WANGERIN ex JESCHKE 1964*: 105 nom. illeg. [Art. 31], non WANGERIN ex VON ROCHOW 1951*) [holotypus hoc loco]
Syn.: Magno-Caricion elatae W.KOCH 1926* sensu auct. p. min. p. [typo excl.] Caricion gracilis NEUHÄUSL 1959* sensu auct. p. p. [typo excl.]
Non: Caricion paniculatae PAWŁOWSKI & WALAS 1949*
C: *Carex paniculata* (transgr.), *Rumex aquaticus* (transgr., terr.), *Scrophularia umbrosa* (transgr., terr.)

4.9.8 Typifications

Galio-Urticetea PASSARGE ex KOPECKÝ 1969*: 250:
Convolvuletalia sepium TX. ex KOPECKÝ 1969*: 250 [lectotypus DENGLER & KOSKA hoc loco] – KOPECKÝ attributed the class name to PASSARGE (1967), but since this author did not publish the name validly according to ICPN Art. 3b, he unintentionally validated the class himself (for the order, see below).

Convolvuletalia sepium TX. ex KOPECKÝ 1969*: 250 nom. illeg. [Art. 31], non MOOR 1958*:
Convolvulion sepium OBERD. ex KOPECKÝ 1969*: 250 nom. illeg. [Art. 31], non TX. 1947* [lectotypus DENGLER & KOSKA hoc loco] – KOPECKÝ attributed the order name to TÜXEN (1950), but since this author did not publish the name validly according to ICPN Art. 8, he unintentionally validated the order himself (for the alliance, see below).

Archangelicion litoralis SCAMONI & PASSARGE 1963*: 175:
Soncho palustris-Archangelicetum TX. 1937*: 78 [lectotypus KOSKA hoc loco] – The alliance was attributed to 'TX. 50' by SCAMONI & PASSARGE (1963), but TÜXEN (1950: 161) only published an alliance named 'Convolvulo-Archangelicion litoralis' which is invalid according to ICPN Arts. 3b and 8. SCAMONI & PASSARGE (1963) are thus the only authors of the Archangelicion litoralis, and not even an ex-citation of TÜXEN is permitted.

Calystegion sepium TX. 1947*: 276 nom. amb. propos.:
Petasito hybrido-Aegopodietum podagrariae TX. 1947*: 153 [lectotypus DENGLER & KOSKA hoc loco] – TÜXEN (1947) also used the name 'Convolvulion sepium', but on page 287 he pointed out that for linguistic reasons prevalence should be given to 'Calystegion sepium'. The type designated here has already been proposed by DENGLER (2002: 66), but for formal reasons it is not a holotype but a lectotype. As pointed out by DENGLER (ibid.), this is the only possible type element since the other association included in the original diagnosis of the alliance, the Convolvulo sepium-Cuscutetum europaeae TX. 1947*, was not validly published according to ICPN Art. 3f. The assertion of MUCINA (1993: 232) that the alliance would not have been published validly according to ICPN Art. 8 is unfounded since one valid association was included. As result of the typification given above, the Calystegion sepium TX. 1947* would be an earlier syntaxonomic synonym of the Filipendulo ulmariae-Petasition hybridi BR.-BL. ex DUVIGNEAUD 1949*. As it always has been used in a different sense in the syntaxonomic literature, i.e. as a syntaxonomic synonym for one of the two alliances Archangelicion litoralis TX. ex SCAMONI & PASSARGE 1963* and Senecionion fluviatilis TX. ex MOOR 1958* (e.g. PASSARGE 1964; MUCINA 1993; POTT 1995; SCHUBERT et al. 2001), which excludes its type association, the Calystegion sepium should be rejected as a *nomen ambiguum*.

Convolvulion sepium OBERD. ex KOPECKÝ 1969: 250 nom. illeg. [Art. 31], non TX. 1947*:
Cuscuto-Convolvuletum sepium TX. ex KOPECKÝ 1969: 238 nom. illeg.[Art. 32a] (= Cuscuto europaeae-Calystegietum sepium TX. ex LOHMEYER 1953* nom. invers. et mut. propos.) [lectotypus DENGLER & KOSKA hoc loco] – KOPECKÝ attributed the alliance name to OBERDORFER (1949), but since this author did not publish the name validly according to ICPN Art. 8, he unintentionally validated the alliance himself. Furthermore, he cited TÜXEN (1947) as author of the type association, but the latter did not describe it validly according to ICPN Art. 3f.

Filipendulo-Petasition BR.-BL. ex DUVIGNEAUD 1949*: 106:
Filipendulo-Geranietum palustris W.KOCH '1925' [read 1926*]: 116 [lectotypus KOSKA hoc loco] – The name of the alliance was first published by BRAUN-BLANQUET (1947: 26), but this was not valid (ICPN Art. 8).

Oenanthion aquaticae HEJNÝ ex NEUHÄUSL 1959*: 126:
Calletum palustris VANDEN BERGHEN 1952* [lectotypus KOSKA hoc loco] – The alliance name was first used by HEJNÝ (1948) in an unpublished thesis paper, but according to ICPN Art. 1 this is an ineffective and therefore an invalid publication. The Oenanthion aquaticae was then validated by NEUHÄUSL (1959) by subordinating two associations. The choice of a lectotype given above is the only one possible since the second association included in the protologue, the '*Glyceria fluitans-Oenanthe aquatica*-Ass. HEJNÝ 1948', is invalid according to ICPN Art. 1 and was not validated by NEUHÄUSL (1959) through the publication of relevés. According to our classification, the inopportune type situation causes the Oenanthion aquaticae to become a syntaxonomic synonym of the Caricion canescenti-nigrae NORDHAGEN ex TX. 1937* nom. corr. (class: Parvo-Caricetea, see sect. 4.8.4) and cannot be used for the vegetation of eutrophic marshes, mires or fluvial shores as has frequently been done in the literature (e.g. BALÁTOVÁ-TULÁČKOVÁ et al. 1993; WEEDA et al. 1995). The correct name for the latter is Phalarido-Glycerion PASSARGE 1964* (see KOSKA 2004).

Phalaridion arundinaceae KOPECKÝ 1961*: 78 nom. amb. propos.:
Phalaridetum arundinaceae LIBBERT 1931*: 30 [lectotypus (Art. 20)] – According to our classification, the type relevé of the Phalaridetum arundinaceae LIBBERT 1931* (see further below) belongs to the Eleocharito palustris-Sagittarion sagittifoliae PASSARGE 1964*. The Phalaridion arundinaceae KOPECKÝ 1961* thus becomes an earlier syntaxonomic synonym of Eleocharito palustris-Sagittarion sagittifoliae PASSARGE 1964*. As a result of the inclusion of Phalaridetum arundinaceae LIBBERT 1931*, the type no longer agrees with the intention of KOPECKÝ (1961) and followers (e.g. BALÁTOVÁ-TULÁČKOVÁ et al. 1993; POTT 1995) which was to differentiate the vegetation of higher parts of fluvial shores from fast-flowing montane rivers by means of this term. Since the name and the common use diverge, we propose rejecting this name as a *nomen ambiguum*. KOPECKÝ (1968) noted this problem, excluded the Phalaridetum arundinaceae LIBBERT 1931* and consequently renamed his alliance as Rumici-Phalaridion arundinaceae KOPECKÝ ['(1961)'] 1968*. We consider it possible that this alliance could stand alone close to the Calystegietalia sepium TX. ex MOOR 1958* nom. cons. et mut. propos. in montane regions.

Phalarido-Glycerion PASSARGE 1964*: 44:
Oenantho aquaticae-Rorippetum amphibiae LOHMEYER 1950*: 20 [lectotypus KOSKA hoc loco]

Acoretum calami SCHULZ 1941*: 39:
SCHULZ (1941: tab. 9, rel. 51) [lectotypus KOSKA hoc loco] – This name thus becomes an earlier syntaxonomic synonym of the Oenantho aquaticae-Rorippetum amphibiae LOHMEYER 1950* which should be conserved because of its widespread use. Sometimes the name Acoretum calami DAGYS 1932* is used, but this is not valid according to ICPN Art. 3d in combination with Principle II, Sect. 2.

Caricetum acutiformis EGGLER 1933*: 148:
EGGLER (1933: p. 148, rel. 2, 'Windorf') [lectotypus KOSKA hoc loco] – This name thus becomes a syntaxonomic synonym of the Scirpo-Phragmitetum W.KOCH 1926*. STEINER (1992) previously designated 'EGGLER (1933: p. 148)' as 'holotypus', but this was invalid since he did not choose one of the two very different relevés as lectotype.

Eleocharitetum palustris UBRIZSY 1948*: 39:
Eleocharis palustris 5, *Chara fragilis* +, *Mentha aquatica* +, *Ranunculus repens* +, *Lycopus europaeus* +; number of species: 5, Mecklenburg-Vorpommern: lake shore near Feldberg – relevé taken from JESCHKE (1959: tab. 4, rel. 18) [neotypus KOSKA hoc loco]

Eleocharito palustris-Hippuridetum vulgaris PASSARGE 1964*: 41:
Glyceria maxima 1, *Sagittaria sagittifolia* 1, *Eleocharis palustris* +, *Hippuris vulgaris* +, *Butomus umbellatus* +, *Glyceria fluitans* +, *Scirpus lacustris* +, *Elodea canadensis* +, *Hottonia palustris* +, *Lemna minor* +; number of species: 10, Brandenburg: Spreewald – relevé taken from PASSARGE (1955: tab. 4, rel. 4) [neotypus KOSKA hoc loco] – Contrary to most citations (e.g. SCHUBERT et al. 2001), PASSARGE (1955) is not the correct author

of this association. He only described an informal 'community' of that name (ICPN Art. 3c), which he validated in PASSARGE (1964) with the publication of a formal association name and a synoptic table but without an unambiguous reference to his relevés of 1955. Through the typification given above this name becomes a syntaxonomic synonym of the Sagittario sagittifoliae-Sparganietum simplicis TX. 1953* nom. cons. propos.

Epilobio hirsuti-Scrophularietum umbrosae NIEMANN et al. 1973*: 608:
Carex acutiformis 3, *Cirsium oleraceum* 2, *Epilobium hirsutum* 2, *Galium aparine* 2, *Eupatorium cannabinum* 1, *Scrophularia umbrosa* 1; number of species: 6, Mecklenburg-Vorpommern: Recknitz valley north of Laage – relevé taken from WOLLERT (1992: tab. 18, rel. 34 = rel. no. 33399 in the vegetation data base of Mecklenburg-Vorpommern) [neotypus KOSKA hoc loco] – NIEMANN et al. (1973) have published this association by using a synoptic table. In addition, they presented two single relevés illustrating atypical or transitional stands. In the syntaxonomic system of KOSKA (2004), the latter would belong to associations different from the majority of the relevés included in the synoptic table. According to ICPN Art. 16, Sect. 2, it would not comply with the rules if one of these two relevés were to be designated as lectotype since at least one of the name-giving species is missing in each of them. For this reason a neotype is published here which corresponds to the contents of the synopotic table. This name thus becomes a syntaxonomic synonym of the Filipendulo-Geranietum palustris W.KOCH 1926*.

Filipendulo-Epilobietum hirsuti SOUGNEZ 1957*: 21:
SOUGNEZ (1957: tab. 2, rel. 6) [lectotypus KOSKA hoc loco] – The name thus becomes a syntaxonomic synonym of the Filipendulo ulmariae-Geranietum palustris W.KOCH 1926*.

Glycerietum aquaticae HUECK 1931*: 122:
HUECK (1931: tab. 4, rel. 4) [lectotypus KOSKA hoc loco] – The name thus becomes a syntaxonomic synonym of the Scirpo lacustris-Phragmitetum australis W.KOCH 1926*.

Glycerietum fluitantis EGGLER 1933*: 156 nom. amb. propos.:
EGGLER (1933: 156, rel. 1) [lectotypus KOSKA hoc loco] – This name thus becomes an earlier syntaxonomic synonym of the Polygono hydropiperis-Veronicetum anagallidis-aquaticae SCHAMINÉE & WEEDA in WEEDA et al. 1995*. We propose rejecting it as a *nomen ambiguum*, because there is a great deal of confusion surrounding the names referring to *Glyceria fluitans* (also used: Sparganio-Glycerietum fluitantis BR.-BL. 1925* nom. inval. [Art. 7], Glycerio-Sparganietum neglecti W.KOCH 1926*) and because the vegetation types summarised under *Glyceria fluitans* result in a combination of significantly different stands. This is due to the fact that this is a wide-ranging species, from stagnant marshes to wet meadows and watercourses. It is still common practice to use its dominance as the main criterion for the definition of the syntaxon (e.g. PHILIPPI 1977; POTT 1995).

Glycerietum plicatae KULCZYŃSKI 1928*: 159:
Berula erecta 3, *Veronica beccabunga* 3, *Glyceria notata* [*G. plicata*] 2, *Agrostis stolonifera* +, *Glyceria fluitans* +, *Nasturtium microphyllum* +, *Rumex* sp. r; number of species: 7, Mecklenburg-Vorpommern: Bobbiner Bach north of Güstrow – relevé taken from WOLLERT & BOLBRINKER (1994: tab. 3, rel. 216 = rel. no. 17552 in the vegetation data base of Mecklenburg-Vorpommern) [neotypus KOSKA hoc loco] – This name thus becomes a syntaxonomic synonym of the Glycerio-Sparganietum neglecti W.KOCH 1926*.

Glycerio-Sparganietum neglecti W.KOCH 1926*: 51:
KOCH (1926: tab. 5, rel. 1) [lectotypus KOSKA hoc loco] – The addition of the epitheton '*fluitans*' as used, for example, by SCHUBERT et al. (2001: 'Sparganio emersi-Glycerietum fluitantis') is not permitted according to the Code (ICPN Art. 40a (Recomm. 10C), 42] since KOCH (ibid.) mentions both *Glyceria fluitans* and *G. plicata* as character species of the association and also *G. aquatica* as character species of the alliance.

Oenantho aquaticae-Rorippetum amphibiae LOHMEYER 1950*: 20 nom. cons. propos.:
PASSARGE (1962: tab. 15, rel. 2) [neotypus KOSKA hoc loco] – The type relevé originates from NW Mecklenburg, which is close to the lower Elbe valley from where the majority of the relevés in the protologue stem. According to our classification and the type situation, the Acoretum calami SCHULZ 1941* is an earlier syntaxonomic synonym of this central association of the Phalarido arundinaceae-Glycerion PASSARGE 1964* (see above). We propose establishing the Oenantho aquaticae-Rorippetum amphibiae instead, because its name-giving species are more frequent in the association than *Acorus calamus* and since this name is used more often in the literature. While some sources accept both names as separate associations, others do so only for the Oenantho aquaticae-Rorippetum amphibiae (e.g. WEEDA et al. 1995).

Petasito hybridi-Aegopodietum podagrariae TX. 1947*: 153:
TÜXEN (1947: tab. 11, rel. 'TX., 17.6.1947') [lectotypus KOSKA & DENGLER hoc loco] – This name thus becomes a syntaxonomic synonym of the Phalarido arundinaceae-Petasitetum officinalis SCHWICKERATH 1933* nom. invers. propos.

Phalaridetum arundinaceae LIBBERT 1931*: 31 nom. amb. propos.:
LIBBERT (1931: tab. 1, rel. 2) [lectotypus KOSKA & PÄZOLT hoc loco] – This name thus becomes an earlier syntaxonomic synonym of the Sagittario sagittifoliae-Sparganietum simplicis TX. 1953*. We propose rejecting it as a *nomen ambiguum*, because it is frequently used for species combinations that differ markedly from its type and original description. Moreover, it is used in the context of distinctly different alliances such as the Magno-Caricion elatae W.KOCH 1926* (e.g. PHILIPPI 1977; BALÁTOVÁ-TULÁČKOVÁ et al. 1993; RENNWALD 2002: 165) and Phalaridion arundinaceae KOPECKÝ 1961* (e.g. POTT 1995). Because of its remarkably euryecious name-giving species, and because it is usually defined as dominance type (e.g. BALÁTOVÁ-TULÁČKOVÁ et al. 1993; POTT 1995; SCHUBERT et al. 2001), this term has been used for a large variety of different vegetation types under various site conditions ranging from wet marshes and fluvial shores to grassland and fallow land under moderately moist conditions. Since its usual content is too broad to be appropriate for an association, WESTHOFF & DEN HELD (1969) as well as WEEDA et al. (1995) have previously decided not to give it the status of an association.

Phalarido arundinaceae-Petasitetum officinalis SCHWICKERATH 1933*: 69 nom. invers. propos. (original form: 'Petasito officinalis-Phalaridetum arundinaceae'):
SCHWICKERATH (1933: 69, rel. 1) [lectotypus KOSKA hoc loco] – The inversion of the name is proposed because *Petasites* has higher cover-abundance values than *Phalaris* in three out of four relevés in the original diagnosis including the type relevé.

Sagittario sagittifoliae-Sparganietum simplicis TX. 1953*: 14 nom. cons. propos.:
PASSARGE (1955: tab. 3, rel. 3) [neotypus KOSKA hoc loco] – The association name is based on *Sparganium simplex* HUDS., which is a synonym of *S. emersum*. In many publications the epitheton has already been changed into 'emersi', but according to ICPN Art 45 a proposal for a *nomen mutatum* would not be justified (yet), since the name *S. simplex* is still in use in contemporary floras (e.g. HESS et al. 1991). We propose establishing the frequently used association name (e.g. POTT 1995; SCHUBERT et al. 2001; RENNWALD 2002) as a *nomen conservandum* against two earlier synonyms whose types belong to the same association according to our classification. The name Scirpo lacustris-Glycerietum aquaticae ALLORGE 1921* is not in common use, even in France (see e.g. JULVE 1993). The name Phalaridetum arundinaceae LIBBERT 1931* is frequently used for another type of vegetation (see above).

Sparganietum ramosi ROLL 1938a*: 471 nom. amb. propos.:
ROLL (1938b: tab. 11, rel. 7122) [neotypus KOSKA hoc loco] – The protologue of the association in ROLL (1938a) only included a synoptic table, but the author published single relevés of his new association in the same year (ROLL 1938b), and the neotype is selected from this publication. The name thus becomes an earlier syntaxonomic synonym of the Polygono hydropiperis-Veronicetum anagallidis-aquaticae SCHAMINÉE & WEEDA in WEEDA et al. 1995*. We propose rejecting it as a *nomen ambiguum*, because it is frequently used for a vegetation that markedly differs from its original description and type. ROLL'S relevés and description largely belong to the later Glycerio-Sparganion BR.-BL. & SISSINGH in BOER 1942* or to the Eleocharito palustris-Sagittarion sagittifoliae PASSARGE 1964* as in our classification (see also WEEDA et al. 1995). By contrast, the association name has been used for stands belonging to the Phragmition communis W.KOCH 1926* by most authors (e.g. PHILIPPI 1977; BALÁTOVÁ-TULÁČKOVÁ et al. 1993; POTT 1995; RENNWALD 2002: 162).

Valeriano-Filipenduletum SISSINGH ex WESTHOFF 1949*: 83:
WESTHOFF (1949: tab. 5, rel. 16) [lectotypus KOSKA hoc loco] – This association name was first used by SISSINGH (in WESTHOFF et al. 1946: 73), but he did not publish it validly according to ICPN Art. 7. It was then validated by WESTHOFF (1949). The selected type relevé in our classification belongs to the Soncho palustris-Archangelicetum TX. 1937*, and so the association becomes a syntaxonomic synonym of this. WESTHOFF himself pointed out a spatial relation to his '*Sonchus paluster*-community'. However, the relevés of the protologue as a whole in our system can be interpreted as a transition from the Soncho-Archangelicetum to the Urtico dioicae-Calystegietum sepium GÖRS & T.MÜLLER 1969*.

4.10 Juncetea maritimi TX. & OBERD. 1958

4.10.1 Typifications

Puccinellion maritimae CHRISTIANSEN 1927*: 4 nom. mut. propos. (original form: 'Festucion maritimae'):
Puccinellietum maritimae CHRISTIANSEN 1927*: 9 nom. mut. propos. (original form: 'Festucetum maritimae') [lectotypus (Art. 20)] – The *nomina mutata* for the alliance and the association are proposed because the name *Festuca maritima* has not been in use for the name-giving species in standard floras for a long time.

Puccinellio-Salicornion BR.-BL. & DE LEEUW 1936*: 371:
Puccinellietum maritimae BR.-BL. & DE LEEUW 1936*: 372 [lectotypus POLTE hoc loco]

Puccinellion distantis PIGNATTI 1953*: 76:
Puccinellio distantis-Spergularietum salinae FEEKES ex PIGNATTI 1953*: 76 (= Puccinellietum distantis FEEKES 1943*) [lectotypus POLTE hoc loco] – The association name was validated by PIGNATTI (1953: 76) by including the Spergularietum salinae TX. & VOLK in TX. 1937* nom. inval. [Art. 3b]. PIGNATTI (ibid.) gave a reference to TÜXEN (1937: 47) where a synoptic table of the association is published.

Blysmetum rufi DU RIETZ & G.DU RIETZ 1925*: 69 nom. cons. et mut. propos. (original form: '*Scirpus rufus*-ass.'):
DU RIETZ & DU RIETZ (1925: tab. 1, *Scirpus rufus*-ass., rel. 1) [lectotypus POLTE hoc loco] – The conservation of this association name of the Uppsala school of vegetation science is proposed following ICPN Art. 52 in combination with Principle II, Sect. 2, since it is widely used in the literature (e.g. SCHUBERT et al. 2001; RENNWALD 2002). Furthermore, the name should be adapted to the recent taxonomic literature because the name *Scirpus rufus* instead of *Blysmus rufus* is no longer customary.

Oenantho lachenalii-Juncetum maritimi TX. 1937*: 67 nom. invers. propos. (original form: '*Juncus maritimus-Oenanthe lachenalii*-Ass.'):
Juncus maritimus 4.5, *Agrostis stolonifera* [*alba salina*] 3.2–3, *Glaux maritima* 1.2, *Juncus gerardii* 1.2, *Aster tripolium* 1.1, *Oenanthe lachenalii* 1.2, *Plantago maritima* 1.1, *Triglochin maritimum* 1.1, *Apium graveolens* +.2, *Inula britannica* +.2, *Carex distans* +.1, *Festuca arundinacea* +.1, *Potentilla anserina* +.1, *Spergula media* [*marginata*] +, *Armeria maritima* +, *Centaurium pulchellum* +, *Lotus tenuis* +, *Carex extensa* 1 St.; number of species: 18, relevé area: unknown, grazed, brackish water, gull colony; Schleswig-Holstein: administrative district Schleswig-Flensburg: Kappeln: Schleimünde: W side of the Lotseninsel, 10,03° E/54,68° N; 30.07.1937 – Relevé kindly supplied by the Tüxen archive, Hannover (signature no. 22/03T06A002C). This relevé, made by R. TÜXEN himself, is one of the two on which he based the synoptic table in the protologue of the association [neotypus POLTE hoc loco] – The inversion of the name is proposed following ICPN Art. 42, since *Juncus* in the type relevé has a much higher coverage than *Oenanthe* and it is also generally more frequent than the latter (cf. POLTE 2001: 97% vs. 88%).

Spergulario salinae-Puccinellietum distantis FEEKES ex VLIEGER 1938*: 39:
VLIEGER (1938: tab. 40, rel. 118) [lectotypus POLTE hoc loco] – This name thus becomes a syntaxonomic synonym of the Puccinellietum maritimae CHRISTIANSEN 1927* nom. mut. propos. (see above).

4.11 Cakiletea maritimae TX. & PREISING ex BR.-BL. & TX. 1952

4.11.1 Typifications

Cakilo-Thero-Salicornietea PIGNATTI 1953*: 67:
Cakiletalia maritimae PIGNATTI 1953*: 78 and 97 [lectotypus ISERMANN & POLTE hoc loco]

4.12 Salicetea purpureae MOOR 1958[8]

4.12.1 Typifications

Salicetalia purpureae MOOR 1958*: 231:
Salicion albae TX. ex MOOR 1958*: 231 [lectotypus LINKE hoc loco]

Salicion albae TX. ex MOOR 1958*: 231:
Salicetum triandro-viminalis LOHMEYER ex MOOR 1958: 289 [lectotypus LINKE hoc loco] – MOOR (1958) attributed this alliance name to TÜXEN (1955), but since it was not validly published there (ICPN Art. 8) he actually validated it in his own publication. Following ICPN Art. 33, we propose giving precedence to the Salicion albae of MOOR (1958) over the homonym of MÜLLER & GÖRS (1958) which was published in the same year.

Salicetum triandrae MALCUIT 1929*: 139 nom. amb. propos.:
NOIRFALISE (in LEBRUN et al. 1955: tab. 1, rel. 3) [neotypus LINKE hoc loco] – The assumption by GRASS (1993: 50) that this name was invalidly published by MALCUIT (1929) is unfounded. It is true that MALCUIT (1929: 140) published relevés without abundance values, but since he presented three such 'relevés' in his paper this information is equivalent to a synoptic table, which is sufficient for the valid description of an association before 1979 (ICPN Art. 7 Sect. 2). Neither an author citation with brackets nor an ex-citation with 'NOIR-

[8] The assumption of RIVAS-MARTÍNEZ et al. (2002: 193) that this class name should be illegitimate according to ICPN Art. 29b is unfounded: Shrubs such as *Salix purpurea* form the highest stratum of many associations within this class. This especially helds for all associations of the Salicion eleagni MOOR 1958* and some associations of the Salicion albae TX. ex MOOR 1958* which are the two alliances of the only order (Salicetalia purpureae MOOR 1958*) included in the original diagnosis. The new class-name Salici purpureae-Populetea nigrae (RIVAS-MARTÍNEZ et al. 1991) RIVAS-MARTÍNEZ et. al. 2002* is thus to be considered illegitimate since it is a *nomen superfluum* (ICPN Art. 29c).

FALISE 1955' as validator is thus authorised. With the typification given above, the name would become a syntaxonomic synonym of the Salici-Populetum MEIJER DREES 1936* (see below). Two of the relevés in MALCUIT (l.c.) and all of NOIRFALISE (in LEBRUN et al. 1955) would belong to the latter association in our classification. Since the name has mostly been used in the sense of the Salicetum triandro-viminalis MOOR 1958* (see below) in the syntaxonomic literature, i.e. for a shrub community (e.g. GRASS 1993; RENNWALD 2002), we propose rejecting this name as a *nomen ambiguum*.

Salicetum triandro-viminalis LOHMEYER ex MOOR 1958*: 289:
MOOR (1958: tab. 20, rel. 15) [lectotypus LINKE hoc loco] – This association name was attributed to LOHMEYER (1953) by MOOR (1958), but it was not published validly there according to ICPN Art. 7 since the author only mentioned the name in his text, without presenting a relevé or a synoptic table (LOHMEYER 1953: 73).

Salici-Populetum MEIJER DREES 1936*: 54 nom. cons. propos.:
MEIJER DREES (1936: tab. 5, rel. 660) [lectotypus LINKE hoc loco] – This association name should be protected against the older but unusual and misleading, validly published names Salicetum triandrae MALCUIT 1929* (see above) and Salicetum viminalis HUECK 1931*, which in our syntaxonomic system belong to the same association.

4.13 Vaccinio uliginosi-Pinetea PASSARGE & G.HOFMANN 1968

4.13.1 General concept (U. CLAUSNITZER)

Some general considerations about this and the two following classes (Molinio-Betuletea pubescentis PASSARGE & G.HOFMANN 1968*, Alnetea glutinosae BR.-BL. & TX. ex WESTHOFF et al. 1946*) are given here first: Because of the fact that only a few phanerophyte species are restricted to wetlands, most character species of woody communities from hydromorphic habitats have to be herbs or bryophytes. According to our methodological concept, character species were only determined within 'structural types', one of them being 'woods' (see sect. 2.4). Consequently, the number of ground layer species which could be used as character species has increased greatly when compared to other concepts. This has made it possible to separate woody communities from hydromorphic and anhydromorphic habitats at a higher syntaxonomic level, i.e. to classify them in distinct classes throughout. Furthermore, in addition to the Salicetea purpureae MOOR 1958* (willow woods exposed to a severe flooding regime, see sect. 4.12), three further classes of woody vegetation of hydromorphic sites can be distinguished according to our classification concept: the Vaccinio uliginosi-Pinetea PASSARGE & G.HOFMANN 1968* of oligotrophic, the Molinio-Betuletea pubescentis PASSARGE & G.HOFMANN 1968* (see sect. 4.14) of mesotrophic and the Alnetea glutinosae BR.-BL. & TX. ex WESTHOFF et al. 1946* (see sect. 4.15) of eutrophic sites. In general all syntaxa of these classes are restricted to more or less wet sites (minimum mean water level in summer: 40 cm below surface).

The floristic differentiation between shrub and forest communities is very difficult or even impossible, especially in wetlands, and so the only remaining distinction may be the height of the uppermost phanerophyte layer. We have therefore not recognised shrub communities in one or more separate classes such as the Franguletea DOING ex WESTHOFF in WESTHOFF & DEN HELD 1969*, the Carici-Salicetea cinereae PASSARGE & G.HOFMANN 1968* or the Betulo-Franguletea PASSARGE & G.HOFMANN 1968* nom. inval. [Art. 8], as has been proposed by other authors (e.g. PASSARGE & HOFMANN 1968; WEBER 1998; SCHAMINÉE et al. 1999; SCHUBERT et al. 2001). In some cases, shrub and forest communities even had to be combined into a single association (for details, see CLAUSNITZER 2004a, 2004b, 2004c; see also OBERDORFER 1992c).

4.13.2 Typifications

Betulo pubescentis-Vaccinietum uliginosi LIBBERT 1933* (≡ Sphagno-Betuletum pubescentis [LIBBERT 1933*] PASSARGE & G.HOFMANN 1968*: 195 nom. illeg. [Art. 29c]):
LIBBERT (1933: tab. 30, rel. 1) [lectotypus CLAUSNITZER hoc loco] – This name thus becomes a syntaxonomic synonym of the Ledo-Pinetum DE KLEIST 1929* nom. invers. propos. (see below)

Betulo-Ledetum DE KLEIST 1929*: 60:
DE KLEIST (1929: tab. 5, rel. 3) [lectotypus CLAUSNITZER hoc loco] – This name thus becomes a syntaxonomic synonym of the Ledo-Pinetum DE KLEIST 1929* nom. invers. propos. (see below)

Eriophoro-Pinetum HUECK 1931*: 154:
HUECK (1931: tab. 12, rel. 3) [lectotypus CLAUSNITZER hoc loco]

Ledo-Pinetum DE KLEIST 1929*: 56 nom. invers. propos. (original form: 'Pineto-Ledetum'):
DE KLEIST (1929: tab. 3, rel. 4) [lectotypus CLAUSNITZER hoc loco] – Following ICPN Art. 10b, the inversion of the name must be proposed.

Pino-Polytrichetum DE KLEIST 1929*: 58:
DE KLEIST (1929: tab. 4, rel. 2) [lectotypus CLAUSNITZER hoc loco] – The name thus becomes a syntaxonomic synonym of the Ledo-Pinetum DE KLEIST 1929* nom. invers. propos. (see above).

Vaccinio uliginosi-Pinetum DE KLEIST 1929*: 54 nom. invers. propos. (original form: 'Pineto-Vaccinietum uliginosi'):
DE KLEIST (1929: tab. 2, rel. 3) [lectotypus CLAUSNITZER hoc loco] – Following ICPN Art. 10b, the inversion of the name must be proposed.

4.14 Molinio-Betuletea pubescentis PASSARGE & G.HOFMANN 1968

4.14.1 General concept (U. CLAUSNITZER)

For general aspects of the classification of wetland wood communities, see sect. 4.13.1, and for details of the delimitation and subdivision as well as the floristic and ecological characterisation of the class, see CLAUSNITZER (2004b). Unlike the usual treatment (e.g. OBERDORFER 1992b; POTT 1995; WILMANNS 1998), all wood communities of mesotrophic wetlands are combined into this separate class independent of the dominant phanerophyte species. In contrast to PASSARGE & HOFMANN (1968), however, two orders are recognised according to the soil pH, i.e. the Molinio-Betuletalia pubescentis PASSARGE & G.HOFMANN 1968* from acidic habitats and the Salici pentandro-Betuletalia pubescentis ord. nov. (see sect. 4.14.2) from base- to calcium-rich habitats.

4.14.2 Salici pentandrae-Betuletalia pubescentis CLAUSNITZER ord. nov. hoc loco

This order contains wood communities from base- to calcium-rich, mesotrophic wetlands. It is further subdivided into two alliances: The Salici pentandrae-Betulion pubescentis all. nov. (see sect. 4.14.4) is typical for wet sites, with water near the surface throughout the whole year, whereas the Rhamno catharticae-Betulion pubescentis all. nov. (see sect. 4.14.3) is restricted to moist habitats, with ground water below the surface for most of the time.

Type: Salici pentandrae-Betulion pubescentis all. nov. (see 4.14.4) [holotypus hoc loco]

Syn.: Alnetalia glutinosae TX. 1937* p. p. [typo excl.]
Salicetalia auritae DOING 1962* p. p. [Art. 8]
Calamagrostio-Salicetalia cinereae PASSARGE & G.HOFMANN 1968* p. p. [typo excl.]
Salicetalia auritae DOING ex KRAUSCH 1968* p. p. [typo excl.]

Excl.: Alno-Salicion cinereae PASSARGE & G.HOFMANN 1968*

C: *Bistorta officinalis, Calliergonella cuspidata, Carex appropinquata, C. lasiocarpa* (transgr.)*, C. nigra, C. panicea* (transgr.)*, C. rostrata* (transgr.)*, Cirsium palustre, Dicranum bonjeanii, Epilobium palustre* (transgr.)*, Galium boreale, G. uliginosum, Lotus pedunculatus, Menyanthes trifoliata, Plagiomnium elatum* (transgr.)*, Potentilla erecta* (transgr.)*, P. palustris* (transgr.)*, Ranunculus acris, Selinum carvifolia, Silene flos-cuculi, Succisa pratensis* (transgr.)*, Valeriana dioica* (transgr.)

D: *Agrostis stolonifera* agg.*, Angelica sylvestris, Caltha palustris, Campylium stellatum, Carex acutiformis, C. elata, C. paniculata, Cirsium oleraceum, Climacium dendroides, Crepis paludosa, Deschampsia cespitosa, Drepanocladus revolvens* agg.*, Eupatorium cannabinum, Festuca rubra* agg.*, Filipendula ulmaria, Geum rivale, Juncus subnodulosus, Lycopus europaeus, Lythrum salicaria, Mentha aquatica, Myosotis scorpioides* subsp. *scorpioides, Poa pratensis* agg.*, P. trivialis* subsp. *trivialis, Rhamnus cathartica, Salix cinerea, Scutellaria galericulata, Stellaria palustris, Thelypteris palustris, Viburnum opulus, Vicia cracca*

4.14.3 Rhamno catharticae-Betulion pubescentis CLAUSNITZER all. nov. hoc loco

This newly-described alliance is restricted to mesotrophic and base-rich wetland habitats with relatively low water levels (i.e. the ground water most of the time below the surface). According to present knowledge, only the type association is included.

Type: Rhamno-Betuletum KLOSS 1962*: 165 [holotypus hoc loco]

Syn.: Alnion glutinosae MALCUIT 1929* p. p. [typo excl.]
Salicion cinereae T.MÜLLER & GÖRS 1958* p. p. [Art. 3b]
Salicion cinereae T.MÜLLER & GÖRS ex PASSARGE 1961* p. p. [typo excl.]

C: *Carex cespitosa, Galeopsis bifida, Genista tinctoria, Gentiana pneumonanthe, Helictotrichon pubescens, Holcus lanatus, Juncus conglomeratus, Polemonium caeruleum, Rhamnus cathartica*

D: *Anthoxanthum odoratum, Euonymus europaea, Galium aparine, Geranium robertianum, Moehringia trinervia, Paris quadrifolia, Plagiomnium undulatum, Ranunculus repens, Urtica dioica*

4.14.4 Salici pentandrae-Betulion pubescentis CLAUSNITZER all. nov. hoc loco

This newly-described alliance brings together stands of wet mesotrophic and base- to calcium-rich habitats. Previously similar stands mostly have been included in the Alnion glutinosae TX. 1937* (e.g. GÖRS 1961; KLOSS 1962) or the Salicion cinereae T.MÜLLER & GÖRS ex PASSARGE 1961*. In CLAUSNITZER (2004b) three associations (Betuletum humilis STEFFEN 1931*, Junco subnodulosi-Betuletum pubescentis KLOSS 1962*, Salici pentandrae-Betuletum pubescentis SOÓ 1955*) and one provisional community (*Cladium mariscus-Salix pentandra*-Ges.) are included.

Type: Salici pentandrae-Betuletum pubescentis SOÓ 1955*: 315 [holotypus hoc loco]

Syn.: Salicion cinereae T.MÜLLER & GÖRS 1958* p. p. [Art. 3b]
Salicion auritae DOING 1962* [Art. 8]
Frangulo-Salicion auritae ['DOING 1962'] OBERD. et al. 1967* p. p. [Art. 8]
Frangulo-Salicion auritae KRAUSCH 1968* p. p. [typo excl.]
Comaro-Salicion cinereae PASSARGE & G.HOFMANN 1968* p. p. [typo excl.]

C: *Betula humilis, Briza media, Bryum pseudotriquetrum, Calliergon giganteum, Campylium stellatum, Cardamine pratensis* agg., *Carex diandra, C. dioica, C. disticha, C. hostiana, C. panicea* (transgr.), *Dactylorhiza incarnata, Drepanocladus revolvens* agg., *Equisetum fluviatile, E. palustre, Fissidens adianthoides, Juncus articulatus, Laserpitium prutenicum, Lathyrus palustris, Liparis loeselii, Pedicularis palustris, Plagiomnium elatum* (transgr.), *Salix repens, Schoenus ferrugineus, Stellaria palustris, Succisa pratensis* (transgr.), *Tomenthypnum nitens, Valeriana dioica* (transgr.)

D: *Alnus glutinosa, Cratoneuron filicinum*

4.14.5 Typifications

Molinio-Betuletea pubescentis PASSARGE & G.HOFMANN 1968*: 190:
Molinio-Betuletalia pubescentis PASSARGE & G.HOFMANN 1968*: 195 [lectotypus (Art. 20)]

Molinio-Betuletalia pubescentis PASSARGE & G.HOFMANN 1968*: 195:
Pleurozio-Betulion pubescentis PASSARGE & G.HOFMANN 1968*: 195 [lectotypus CLAUSNITZER hoc loco]

Comaro-Salicion cinereae PASSARGE & G.HOFMANN 1968*: 221:
Comaro-Salicetum auritae PASSARGE & G.HOFMANN 1968*: 221 [lectotypus CLAUSNITZER hoc loco]

Molinio-Frangulion PASSARGE & G.HOFMANN 1968*: 249:
Molinio-Franguletum PASSARGE & G.HOFMANN 1968*: 249 [lectotypus (Art. 20)] – The previous lectotypification of this alliance with the Molinio-Myricetum gale PASSARGE & G.HOFMANN 1968* by WEBER (1998: 12) was invalid according to ICPN Art. 20.

Alno-Sphagnetum LEMÉE 1937*: 346:
LEMÉE (1937: tab. 108, rel. 3) [lectotypus CLAUSNITZER hoc loco] – This name thus becomes a syntaxonomic synonym of the Salici auritae-Betuletum pubescentis MEIJER DREES 1936* nom. invers. propos.

Alno glutinosae-Dryopteridetum thelypteridis KLIKA 1940*: 99:
KLIKA (1940: p. 100, rel. 3) [lectotypus CLAUSNITZER hoc loco] – This name thus becomes a syntaxonomic synonym of the Salici auritae-Betuletum pubescentis MEIJER DREES 1936* nom. invers. propos.

Betuletum pubescentis TX. 1937*: 126 nom. amb. propos. (≡ Betuletum pubescentis typicum TX. 1937*):
Betula pubescens 5, *Molinia caerulea* 5, *Quercus robur* 2, *Dicranum scoparium* 1, *Calamagrostis epigejos* 1, *Calluna vulgaris* 1, *Deschampsia flexuosa* 1, *Hypnum jutlandicum* [*H. cupressiforme ericetorum*] 1, *Polytrichum commune* 1, *Scleropodium* [*Hypnum*] *purum* 1, *Mnium hornum* +, *Frangula alnus* +, *Sorbus aucuparia* +, *Dryopteris dilatata* [*austriaca*] +, *Rubus* sp. +, *Pohlia nutans* +, *Erica tetralix* +, *Potentilla erecta* +, *Juncus effus* +, *Danthonia* [*Sieglingia*] *decumbens* +, *Agrostis capillaris* +, *Carex pilulifera* +, *Polytrichum juniperinum* +; number of species 23; NW German lowlands – Relevé kindly supplied by the Tüxen archive, Hannover (relevé no. 92 in the handwritten table of the Betuletum pubescentis by R. TÜXEN). This relevé is one of the eight on which he based the synoptic table in the protologue of the as-

sociation (typical subassociation) [neotypus CLAUSNITZER hoc loco] – This name would thus be an earlier syntaxonomic synonym of the Lysimachio vulgaris-Quercetum roboris PASSARGE & G.HOFMANN 1968*. Since it has been used in very different senses in the phytosociological literature, we propose rejecting it as a *nomen ambiguum*.

Comaro-Salicetum auritae PASSARGE & G.HOFMANN 1968*: 221:
Salix cinerea (S) 5, *S. aurita* (S) 1, *Sphagnum palustre* 1–2, *Carex canescens* +, *Lysimachia vulgaris* +, *Mnium hornum* +; number of species: 6, Mecklenburg-Vorpommern: mire on the island of Rügen – relevé taken from JESCHKE (1964: tab. 36, rel. 13) [neotypus CLAUSNITZER hoc loco] – This name thus becomes a syntaxonomic synonym of the Salici auritae-Betuletum pubescentis nom. invers. propos. MEIJER DREES 1936*. The author citations of TÜXEN (1937) or PASSARGE (1961) in brackets, as given by PASSARGE & HOFMANN (1968), are not correct: On the one hand, the Salici auritae-Franguletum alni TX. 1937* is only partly included in the Comaro-Salicetum auritae by the authors and so the latter cannot be considered to have been a *nomen novum* for the first. In any case, if such a formal renaming had been intended, it would have been illegitimate. On the other hand, the authors do not explicitly mention any syntaxon of PASSARGE (1961) to which they refer as basionym (most probably they mean the Salicetum pentandro-cinereae comaretosum [PASSARGE 1957*] PASSARGE 1961* [≡ Salicetum pentandro-auritae PASSARGE 1957*]).

Junco-Betuletum KLOSS 1962*: 166:
Calliergonella cuspidata [*Acrocladium cuspidatum*] 4, *Betula pubescens* (S) 4, *B. humilis* 1, *B. pubescens* (H) 1, *Carex appropinquata* 1, *C. hostiana* 1, *Potentilla palustris* [*Comarum palustre*] 1, *Equisetum palustre* 1, *Carex elata* +, *C. nigra* +, *C. panicea* +, *C. rostrata* +, *Equisetum fluviatile* +, *Filipendula ulmaria* +, *Galium boreale* +, *Geum rivale* +, *Laserpitium prutenicum* +, *Lathyrus palustris* +, *Lotus pedunculatus* [*uliginosus*] +, *Mentha aquatica* +, *Menyanthes trifoliata* +, *Potentilla erecta* +, *Salix repens* +, *Succisa pratensis* +, *Valeriana dioica* +, *Vicia cracca* +, *Bistorta officinalis* [*Polygonum bistorta*] r, *Galium uliginosum* r; number of species: 27, relevé area: 30 m², total cover: 100%, Mecklenburg-Vorpommern: Peene valley near Gützkow – relevé taken from KLOSS (1965, tab. 9, rel. 4) [neotypus CLAUSNITZER hoc loco]

Pleurozio-Betuletum pubescentis PASSARGE & G.HOFMANN 1968*: 198:
Alnus glutinosa (T) 3, *Betula pubescens* (S) 3, *Molinia caerulea* 3, *Betula pubescens* (T) 2b, *Pinus sylvestris* (T) 2b, *Leucobryum glaucum* 2a, *Carex nigra* 2a, *Sphagnum fimbriatum* 2a, *Alnus incana* (S) 2m, *Calamagrostis canescens* 2m, *Deschampsia cespitosa* 2m, *Lysimachia vulgaris* 2m, *Myrica gale* 2m, *Quercus robur* (S) 2m, *Carex canescens* 1, *Sorbus aucuparia* (S) 1, *Carex panicea* 1, *Dryopteris carthusiana* 1, *Frangula alnus* 1, *Galium palustre* subsp. *palustre* 1, *Osmunda regalis* 1, *Peucedanum palustre* 1, *Thelypteris palustris* 1, *Dicranella heteromalla* +, *Dicranum scoparium* +, *Frangula alnus* (S) +, *Holcus lanatus* +, *Lophocolea bidentata* +, *Lysimachia thyrsiflora* +, *Mnium hornum* +, *Phragmites australis* +, *Pleurozium schreberi* +, *Sphagnum palustre* +; number of species: 31, relevé area: 300 m², Mecklenburg-Vorpommern: Anklamer Stadtbruch near Greifswald, 26.06.1993 – relevé taken from GRÜNBAUER & CHEUNG (1994: tab. 10, rel. 130 = rel. no. 23787 in the vegetation data base of Mecklenburg-Vorpommern) [neotypus CLAUSNITZER hoc loco] – This name thus becomes a syntaxonomic synonym of the Lysimachio vulgaris-Quercetum roboris PASSARGE & G.HOFMANN 1968*. Both names are valid and were published in the same book. While PASSARGE & HOFMANN (1968) lay great emphasis on the dominant tree species, in our concept we take note of the entire species composition. Both *Quercus robur*- and *Betula pubescens*-dominated types can therefore occur in the association as delimited by us. As it is more meaningful, we have applied the name Lysimachio-Quercetum to it (CLAUSNITZER 2004b).

Salici pentandrae-Betuletum pubescentis SOÓ 1955*: 315:
Phragmites australis 5, *Carex acuta* 4, *Salix cinerea* (S) 4, *Lysimachia vulgaris* 2b, *Salix pentandra* (S) 2b, *Calliergonella cuspidata* [*Acrocladium cuspidatum*] 2b, *Geum rivale* 2b, *Alnus glutinosa* (T) 2a, *Betula pubescens* (T) 2a, *Lythrum salicaria* 2a, *Galium palustre* 2m, *Filipendula ulmaria* 1, *Geranium palustre* 1, *Iris pseudacorus* 1, *Lycopus europaeus* 1, *Symphytum officinale* 1, *Equisetum fluviatile* +, *E. palustre* +, *Humulus lupulus* +, *Potentilla palustris* +, *Viburnum opulus* (H) r; number of species: 21, relevé area: 100 m², total cover: 75%, Mecklenburg-Vorpommern: Peene valley near Gützkow – relevé taken from FISCHER (1995, tab. 15, rel. 25 = rel. no. 39175 in the vegetation data base of Mecklenburg-Vorpommern) [neotypus CLAUSNITZER hoc loco]

4.15 Alnetea glutinosae BR.-BL. & TX. ex WESTHOFF et al. 1946

4.15.1 General concept (U. CLAUSNITZER)

For general aspects of the classification of wetland wood communities, see sect. 4.13.1, and for details of the delimitation and subdivi-

sion as well as the floristic and ecological characterisation of the class, see CLAUSNITZER (2004c): In this class, many authors have combined shrub and wood communities from mesotrophic as well as from eutrophic habitats (e.g. OBERDORFER 1992c; GEISSELBRECHT-TAFERNER & WALLNÖFER 1993). According to our concept, the emended class covers only communities from eutrophic habitats. Mesotraphent communities have been classified within the Molinio-Betuletea pubescentis PASSARGE & G.HOFMANN 1968* (see sect. 4.14). Following our classification concept (see sect. 4.13.1) and because of the the close floristic relationships between hydromorphic *Alnus glutinosa*- and *Fraxinus excelsior*-communities (see also DÖRING-MEDERAKE 1991), both groups are included in the Alnetea glutinosae instead of subordinating *Fraxinus excelsior*-communities to the Querco-Fagetea BR.-BL. & VLIEGER in VLIEGER 1937* or the Carpino-Fagetea PASSARGE & G.HOFMANN 1968* respectively, as has been done in most of the recent overviews (e.g. POTT 1995; SCHUBERT et al. 2001; RENNWALD 2002). Based on different water regime characteristics, the class has been subdivided into three floristically well-defined orders: the Cardamino amarae-Alnetalia glutinosae ord. nov. (percolating, see sect. 4.15.2), the Alnetalia glutinosae TX. 1937* nom. cons. propos. (stagnant) and the central order Alno glutinosae-Fraxinetalia excelsioris PASSARGE & G.HOFMANN 1968* (deeper ground water).

4.15.2 Cardamino amarae-Alnetalia glutinosae CLAUSNITZER ord. nov. hoc loco

This order contains shrub and wood communities from eutrophic wetland habitats with percolating ground water (cf. KOSKA 2001a). Although many authors still interpret *Alnus glutinosa* stands with *Cardamine amara* as a subassociation of the Carici elongatae-Alnetum glutinosae TX. 1931* (e.g. DÖRING-MEDERAKE 1991; BRAND 2000), this seems rather inadequate both for floristic and for ecological reasons. PASSARGE & HOFMANN (1968) have already described these vegetation types as a separate alliance Cardamino-Fraxinion excelsioris PASSARGE & G.HOFMANN 1968*. Since the similar Carici remotae-Fraxinion excelsioris PASSARGE & G.HOFMANN 1968* (including the Carici remotae-Fraxinetum excelsioris W.KOCH ex FABER 1937*) was added in CLAUSNITZER (2004c, see also DÖRING-MEDERAKE 1991), the erection of a new order has become necessary.

Type: Cardamino-Fraxinion excelsioris PASSARGE & G.HOFMANN 1968*: 52 [holotypus hoc loco]

Syn.: Fagetalia sylvaticae PAWŁOWSKI et al. ex TX. 1937* p. p. [typo excl.]
Fraxinetalia SCAMONI & PASSARGE 1959* p. min. p. [typo excl.]
Alno-Fraxinetalia excelsioris ['(OBERD. 1953)'] PASSARGE & G.HOFMANN 1968* p. p. [typo excl.]

C: *Cardamine amara* (transgr.), *Carex remota, C. strigosa, C. sylvatica, Chrysosplenium alternifolium, Circaea lutetiana, C.* × *intermedia* (transgr.), *Crepis paludosa, Epilobium hirsutum, Equisetum sylvaticum, Gagea spathacea, Lysimachia nemorum, Plagiomnium undulatum, Ranunculus auricomus* agg., *R. ficaria* subsp. *bulbilifer, R. repens, Rumex sanguineus, Valeriana officinalis* agg., *Veronica montana*

D: *Acer pseudoplatanus, Ajuga reptans, Brachypodium sylvaticum, Corylus avellana, Equisetum arvense, Fagus sylvatica, Galium odoratum, Lamium galeobdolon* agg., *Mercurialis perennis, Stellaria nemorum, Viola reichenbachiana*

4.15.3 Cratoneuro filicini-Alnetum glutinosae (SCAMONI 1957) CLAUSNITZER nom. nov. hoc loco

This association, which was validly described by SCAMONI (1957), though under an illegitimate name, has been accepted by CLAUSNITZER (2004c) because of its ecological and floristic independence. It is characterised by species such as *Cratoneuron filicinum*, *Palustriella commutata* and *Conocephalum conicum* (also see SCAMONI 1957; JESCHKE 1964). The delimitation of the Cratoneuro filicini-Alnetum glutinosae as treated in CLAUSNITZER (2004c) is somehow narrower than in the original diagnosis of SCAMONI (1957).

Protologue: 'Alnetum fontinale' (SCAMONI 1957: 90)

Type: *Alnus glutinosa* (T) 4, *Carex remota* 3, *Ranunculus repens* 3, *Cardamine amara* 2, *Chrysosplenium oppositifolium* 2, *Conocephalum conicum* 2, *Eurhynchium*

praelongum 2, *Filipendula ulmaria* 2, *Fraxinus excelsior* (S) 2, *Geranium robertianum* 2, *Lysimachia nemorum* 2, *Circaea lutetiana* 1, *Crepis paludosa* 1, *Ranunculus ficaria* 1, *Galium palustre* 1, *Lamium galeobdolon* 1, *Mnium hornum* 1, *Oxalis acetosella* 1, *Poa trivialis* 1, *Anemone nemorosa* +, *Carex silvatica* +, *Chrysosplenium alternifolium* +, *Cratoneuron filicinum* +, *Galium odoratum* +, *Veronica montana* +; number of species: 25, Mecklenburg-Vorpommern: mire on the island of Rügen – relevé taken from JESCHKE (1964: tab. 32, rel. 4, named 'Carici remotae-Fraxinatum') [neotypus CLAUSNITZER hoc loco]

Syn.: Cardamino-Fraxinetum excelsioris PASSARGE & G.HOFMANN 1968* p. p.

Note: The name Alnetum fontinale SCAMONI 1957* is illegitimate according to ICPN Art. 34a and is therefore replaced here with a *nomen novum*. Since the original diagnosis only contains a synoptic table, a neotype had to be designated.

4.15.4 Typifications

Alno-Fraxinetalia PASSARGE & G.HOFMANN 1968*: 39:
Filipendulo-Fraxinion excelsioris PASSARGE & G.HOFMANN 1968*: 40 [lectotypus CLAUSNITZER hoc loco]

Populetalia albae TX. 1931*: 70 nom. amb. propos.:
Alnion glutinosae TX. 1931*: 98 [lectotypus CLAUSNITZER & LINKE hoc loco] – This is the only possible choice of a lectotype because the second alliance mentioned in the protologue, the Populion albae TX. 1931*, was not validly described. This is due to the fact that the only association included in this second alliance, the Salicetum albae TX. 1931*, is not a valid name either, since no cover-abundance values are given in one of the two published relevés (ICPN Art. 7) and in the second the name-giving species is absent (ICPN Art. 3f). Since the name Populetalia albae (with different author citations) has generally been used for riparian woodlands, usually placed within the classes Querco-Fagetea BR.-BL. & VLIEGER in VLIEGER 1937* or Salici purpureae-Populetea nigrae (RIVAS-MARTÍNEZ et al. 1991) RIVAS-MARTÍNEZ et. al. 2002* nom. illeg. [Art. 29c] (= Salicetea purpureae MOOR 1958*), we propose rejecting it as a *nomen ambiguum*. On the other hand, the name Alnetalia glutinosae TX. 1937*, which has been used for a long time in accordance with its type, should be protected as *nomen conservandum*.

Alnion glutinosae TX. 1937*: 133:
Alnetum glutinosae TX. 1937*: 136 [lectotypus (Art. 20)]

Alno-Ulmion BR.-BL. & TX. ex TCHOU YEN-TCHENG 1948*: 21 nom. cons. propos.:
Alnetum incanae AICHINGER & SIEGRIST 1930*: 797 [lectotypus CLAUSNITZER & LINKE hoc loco] – This name was first suggested by BRAUN-BLANQUET & TÜXEN (1943: 10) but not validly published by them (ICPN Art. 8). We propose conserving this commonly used name against the earlier syntaxonomic synonym Alnion incanae PAWŁOWSKI et al. 1928*.

Filipendulo-Fraxinion excelsioris PASSARGE & G.HOFMANN 1968*: 40:
Filipendulo-Fraxinetum excelsioris PASSARGE & G.HOFMANN 1968*: 41 [lectotypus (Art. 20)]

Alnetum glutinosae ISSLER 1926*: 149 nom. amb. propos.:
ISSLER (1926: tab. 1, rel. 4) [lectotypus CLAUSNITZER hoc loco] – This name thus becomes an earlier syntaxonomic synomym of the Pruno-Fraxinetum OBERD. 1953*. Because the name 'Alnetum glutinosae' has been used for very different syntaxa by various authors (e.g. DE KLEIST 1929; MALCUIT 1929; TÜXEN 1937) we propose rejecting it as a *nomen ambiguum*.

Alnetum glutinosae MALCUIT 1929*: 146 nom. illeg. [Art. 31]:
MALCUIT (1929: p. 146, rel. 5) [lectotypus CLAUSNITZER hoc loco] – This name would thus be an earlier syntaxonomic synonym of the Carici elongatae-Alnetum glutinosae TX. 1931*, but as a later homonym of the Alnetum glutinosae ISSLER 1926* it is illegitimate.

Carici elongatae-Alnetum glutinosae TX. 1931*: 98:
Alnus glutinosa (T) 4, *Carex elongata* 4, *Galium palustre* 2b, *Solanum dulcamara* 2b, *Calamagrostis canescens* 1, *Calliergonella cuspidata* [*Calliergon cuspidatum*] 1, *Carex vesicaria* 1, *Dryopteris dilatata* 1, *Iris pseudacorus* 1, *Carex elata* +, *C. pseudocyperus* +, *Glyceria fluitans* +, *Juncus effusus* +, *Lycopus europaeus* +, *Lysimachia vulgaris* +, *Lythrum salicaria* +, *Mnium hornum* +, *Plagiomnium affine* agg. ['*Mnium affine* sp.'] +, *Rubus idaeus* +, *Salix cinerea* (S) +; number of species: 20, relevé area: 7 m^2, NW Mecklenburg-Vorpommern near Gadebusch – relevé taken from PASSARGE (1960: tab. 4, rel. 5, named 'Carici elongatae-Alnetum') [neotypus CLAUSNITZER hoc loco] – The protologue of the association contains four 'relevés' as species lists, but without cover-abundance values. Since this information is equivalent to a synoptic table, this description is to be regarded as valid, but the association had to be typified by a 'real' relevé from another source.

Irido-Alnetum glutinosae DOING ex PASSARGE & G.HOFMANN 1968*: 31 nom. cons. propos.:
Alnus glutinosa (T) 5, *Angelica archangelica* 3, *Calliergonella cuspidata* 3, *Geum rivale* 3, *Alnus glutinosa* (S) 2a, *Deschampsia cespitosa* 2a, *Fraxinus excelsior* 2a, *Iris pseudacorus* 2a, *Solanum dulcamara* 2a, *Urtica dioica* 2a, *Poa trivialis* 2m, *Ranunculus repens* 2m, *Equisetum palustre* 1, *Filipendula ulmaria* 1, *Lycopus europaeus* 1, *Lysimachia vulgaris* 1, *Scutellaria galericulata* 1, *Typha latifolia* 1, *Carex elata* +, *Galium uliginosum* +, *Lythrum salicaria* +, *Nasturtium officinale* +, *Plagiomnium affine* +, *P. elatum* [*Mnium seligeri*] (H) +, *Ribes nigrum* +, *Carex pseudocyperus* r; number of species: 25, relevé area: 40 m^2, Mecklenburg-Vorpommern: Peene valley near Gützkow – relevé taken from FISCHER (1995: tab. 15, rel. 60, named 'Beinwell-Schwertlilien-Erlenwald' = rel. no. 39210 in the vegetation data base of Mecklenburg-Vorpommern) [neotypus CLAUSNITZER hoc loco] – This name was first suggested by DOING (1962) but not validly published by him (ICPN Art. 7). We propose conserving this commonly used name against the earlier syntaxonomic synonym Alno-Salicetum cinereae PASSARGE 1956*.

Pruno-Fraxinetum OBERD. 1953*: 49 nom. cons. propos.:
Alnus glutinosa 1.1, *A. incana* 1.1, *Fraxinus excelsior* 1.1, *Prunus padus* 1.1, *P. spinosa* 1.1, *Quercus robur* 1.1, *Filipendula ulmaria* +.2, *Impatiens noli-tangere* +.2, *Urtica dioica* +.2, *Acer pseudoplatanus* +, *Aegopodium podagraria* +, *Angelica sylvestris* +, *Athyrium filix-femina* +, *Brachypodium sylvaticum* +, *Cardamine amara* +, *Carpinus betulus* +, *Cirsium oleraceum* +, *Corylus avellana* +, *Dactylis glomerata* agg. [*D. glomerata*] +, *Geranium palustre* +, *Geranium robertianum* +, *Geum urbanum* +, *Glechoma hederacea* +, *Lonicera xylosteum* +, *Paris quadrifolia* +, *Primula elatior* +, *Salix alba* +, *Senecio nemorensis* agg. [*S. fuchsii*] +, *Silene dioica* +, *Stachys sylvatica* +, *Elymus caninus* [*Triticum caninum*] +; Baden-Württemberg: Glems valley between 'Schatten' and 'Glemseck' – relevé taken from BAUR (1941: p. 162, rel. 3, named 'Übergänge zwischen Erlenbruch und feuchtem Eichenhainbuchenwald') [neotypus CLAUSNITZER hoc loco] – The designated type relevé belongs to those on which OBERDORFER (1953: 49) based column c in the synoptic table in his original diagnosis of the association. The selection thus conforms with ICPN Recomm. 21A. We propose conserving this commonly used association name against the earlier syntaxonomic synonym Alnetum glutinosae ISSLER 1926* nom. amb. propos. (see above). The fact that several associations named 'Alnetum glutinosae' with very different content have been described by various authors (e.g. ISSLER 1926; DE KLEIST 1929; MALCUIT 1929; TÜXEN 1937) also argues against the re-introduction of the latter name.

Salicetum pentandro-auritae PASSARGE 1957* (≡ Salicetum auritae OBERD. ex KRAUSCH 1968*: 353 nom. illeg. [Art. 29c])
PASSARGE (1957: tab. 22, rel. 13) [lectotypus CLAUSNITZER hoc loco] – This name thus becomes a syntaxonomic synonym of the Carici elongatae-Alnetum glutinosae TX. 1931*.

4.16 Vaccinio-Piceetea BR.-BL. in BR.-BL. et al. 1939

4.16.1 Typifications

Vaccinio-Piceetea BR.-BL. in BR.-BL. et al. 1939*: 2: Vaccinio-Piceetalia BR.-BL. in BR.-BL. et al. 1939*: 10 [lectotypus (Art. 20)]

Piceetalia excelsae PAWŁOWSKI et al. 1928*: 255:
Piceion excelsae PAWŁOWSKI et al. 1928*: 257 [lectotypus (Art. 20)]

Dicrano-Pinion (LIBBERT 1933*) MATUSZKIEWICZ 1962*: 150 nom. cons. propos. (≡ Pinion [LIBBERT 1933*] OBERD. 1957* nom. rejic. propos.; basionym: Pinion medioeuropaeum LIBBERT 1933*: 327 nom. illeg. [Art. 34a]):
Pinetum sylvestris neomarchicum LIBBERT 1933*: 328 nom. illeg. [Art. 34a] [lectotypus BERG hoc loco] – The name Dicrano-Pinion (LIBBERT 1933*) MATUSZKIEWICZ 1962* is widely used in the recent syntaxonomic literature in accordance with its type (e.g. WALLNÖFER 1993; POTT 1995; SCHUBERT et al. 2001; HOMMEL et al. 1999; RENNWALD 2002). It should therefore be protected following ICPN Art. 52 against the older, but unusual and ambiguous, homotypic name Pinion (LIBBERT 1933*) OBERD. 1957*.

Vaccinio-Piceion BR.-BL. in BR.-BL. et al. 1939*: 10:
Piceetum subalpinum BR.-BL. in BR-BL. et al. 1939*: 22 nom. illeg. [Art. 34a] [lectotypus BERG & CLAUSNITZER hoc loco]

Cladino-Pinetum JURASZEK 1927*: 578 nom. invers. propos. (original form: 'Pineto-Cladinetum'):
JURASZEK (1927: tab. 2, rel. 2) [lectotypus BERG hoc loco] – Following ICPN Art. 10b, the inversion of the name must be proposed. The alteration of the name into 'Cladonio-Pinetum' as often found in the literature is not permitted according to ICPN Art. 45. Furthermore a proposal for a *nomen mutatum* would not be justified since *Cladina* is still used as a generic name in recent floras (e.g. MOBERG & HOLMÅSEN 1992).

Festuco-Pinetum KOBENDZA 1930*: 58 nom. invers. propos. (original form: 'Pineto-Festucetum'):
KOBENDZA (1930: tab. 10, rel. 27) [lectotypus BERG hoc loco] – The inversion of the name must be proposed according to ICPN Art. 10b. This association with continental species such as *Chamaecytisus ratisbonensis, Cytisus nigricans* and *Viola rupestris* does not occur in Mecklenburg-Vorpommern.

Pinetum sylvestris neomarchicum LIBBERT 1933*: 328 nom. illeg. [Art. 34a]:
LIBBERT (1933: tab. 29, rel. 2) [lectotypus BERG hoc loco] – The name thus becomes a syntaxonomic synonym of the Vaccinio myrtilli-Pinetum JURASZEK 1927* nom. invers. propos. (see below).

Vaccinio myrtilli-Pinetum JURASZEK 1927*: 583 nom. invers. propos. (original form: 'Pineto-Myrtilletum'):
JURASZEK (1927: tab. 4, rel. 10) [lectotypus BERG hoc loco] – Following ICPN Art. 10b, the inversion of the name must be proposed.

4.17 Quercetea robori-petraeae BR.-BL. & TX. ex BR.-BL. 1950 nom. mut. propos.[9]

4.17.1 Typification

Vaccinio myrtilli-Fagetum sylvaticae SCAMONI 1935*: 637 nom. invers. propos. (original form: '*Fagus silvatica-Vaccinium myrtillus*-Assoziation'):
Fagus sylvatica (T) 5, *Oxalis acetosella* 2, *Vaccinium myrtillus* 2, *Calamagrostis canescens* 1, *Moehringia trinervia* 1, *Anthoxanthum odoratum* +, *Brachypodium sylvaticum* +, *Carex pilulifera* +, *Deschampsia flexuosa* +, *Dryopteris carthusiana* +, *Fagus sylvatica* (S) +, *F. sylvatica* (H) +, *Festuca ovina* agg. [*Festuca ovina*] +, *Juncus effusus* +, *Milium effusum* +, *Mycelis muralis* +, *Poa pratensis* +, *Rumex acetosella* +, *Veronica officinalis* +; number of species 17, cover shrub layer 1%, cover herb layer 60%, Mecklenburg-Vorpommern: c. 10 km east of Neustrelitz – relevé taken from SCAMONI (1963: tab. 63, rel. 144) [neotypus SPANGENBERG hoc loco] – Since SCAMONI (1935) only published a synoptic list, the selection of a neotype was necessary. Following ICPN Art. 10b, the inversion of the name must be proposed.

[9] We propose to change the class name from Quercetea robori-sesseliflorae to Quercetea robori-petraeae since the name *Quercus sesseliflora* is not in use any more.

[10] The assumption of MUCINA (1997: 145) that the correct name of this class should be Querco-Fagetea BR.-BL. & VLIEGER in VLIEGER 1937* is not justified. Querco-Fagetea only then is the correct class name when the thermophilous oak woods of submediterranean and east-European distribution (Quercetalia KLIKA 1933*) are included. But in both MUCINA (1997) and BERG et al. (2004a) as well as in various other overviews (e.g. PASSARGE & HOFMANN 1968; SCHUBERT et al. 2001), these are treated as a separate class (Quercetea pubescentis DOING-KRAFT ex SCAMONI & PASSARGE 1959*). The Querco-Fagetea contained two orders in the original diagnosis of VLIEGER (1937: 349), the Fagetalia TX. & DIEMONT ex VLIEGER 1937* and the Quercetalia pubescentis BR.-BL. ex VLIEGER (= Quercetalia KLIKA 1933*). When these two orders are re-arranged in different classes, ICPN Art. 35 becomes effective and the former class name must not be used for any of these two classes. The renaming of the former class Querco-Fagetea by PASSARGE & HOFMANN (1968: 75), following the exclusion of the xerophilous oak forests (Peucedano-Quercetea PASSARGE & G.HOFMANN 1968*), was therefore legitimate. Their new class name, Carpino-Fagetea, is the oldest valid and thus the correct name for a more narrowly delimited class of the deciduous mesophytic and subxerophytic woods of temperate and subboreal Europe.

4.18 Carpino-Fagetea PASSARGE & G.HOFMANN 1968[10]

4.18.1 Typifications

Carpino-Fagetalia SCAMONI & PASSARGE 1959*: 392:
Eu-Fagion (OBERD. 1957*) SCAMONI & PASSARGE 1959*: 392 nom. illeg. [Art. 34b] [lectotypus SPANGENBERG hoc loco]

Fagetalia sylvaticae PAWŁOWSKI et al. ex TX. 1937*: 139:
Fagion sylvaticae PAWŁOWSKI et al. ex TX. 1937*: 140 [lectotypus (Art. 20)] – According to ICPN Art. 3f, the order was not validly published by PAWŁOWSKI et al. (1928: 259). These authors only included one valid alliance, the Alnion incanae PAWŁOWSKI et al. 1928*, but in the two relevés of its single association *Fagus* is absent. The second alliance mentioned, the 'Fagion silvaticae', is not accompanied either by an author citation or by relevés. The invalid order name was then validated by TÜXEN (1937), and the author citation must therefore read as given above. Following ICPN Art. 33, we propose giving precedence to the Fagetalia sylvaticae PAWŁOWSKI et al. ex TX. 1937* over the Fagetalia TX. & DIEMONT ex VLIEGER 1937* (= Fagetalia TX. & DIEMONT 1936* nom. inval. [Art. 8]) which were published in the same year.

Fraxinetalia SCAMONI & PASSARGE 1959*: 392:
Aceri-Ulmion SCAMONI & PASSARGE 1959*: 392 [lectotypus CLAUSNITZER & SPANGENBERG hoc loco]

Aceri-Ulmion SCAMONI & PASSARGE 1959*: 392:
Fraxino-Fagetum SCAMONI in SCAMONI & PASSARGE 1959*: 392 [lectotypus SPANGENBERG hoc loco]

Mercuriali perennis-Fagetum sylvaticae SCAMONI 1935*: 634 nom. invers. propos. (original form: '*Fagus silvatica-Mercurialis perennis*-Assoziation'):
Fagus sylvatica (T) 4, *Anemone nemorosa* 3, *Festuca altissima* 2, *Galium odoratum* 2, *Hedera helix* 2, *Hepatica nobilis* 2, *Melica uniflora* 2, *Mercurialis perennis* 2, *Poa nemoralis* 2, *Actaea spicata* 1, *Anemone ranunculoides* 1, *Campanula trachelium* 1, *Fagus sylvatica* (S) 1, *Lathyrus vernus* 1, *Primula elatior* 1, *Pulmonaria obscura* 1, *Sanicula europaea* 1, *Stellaria holostea* 1, *Vicia sepium* 1, *Viola reichenbachiana* 1, *Brachypodium sylvaticum* +, *Cardamine bulbifera* +, *Carex digitata* +, *Deschampsia cespitosa* +, *Festuca rubra* +, *Hordelymus europaeus* +, *Lamium galeobdolon* agg. [*Lamium galeobdolon*] +, *Maianthemum bifolium* +, *Milium effusum* +, *Oxalis acetosella* +, *Phyteuma spicatum* +, *Taraxacum* sect. *Ruderalia* [*T. officinale*] +; number of species: 31, Mecklenburg-Vorpommern: island of Rügen: Jasmund peninsula – relevé taken from JESCHKE (1964: tab. 12, rel. 14) [neotypus SPANGENBERG hoc loco] – Since SCAMONI (1935) published only two synoptic lists, the selection of a neotype was necessary. The name is thus an earlier syntaxonomic synonym of the Elymo europaei-Fagetum KUHN 1937*. Following ICPN Art. 10b, the inversion of the name must be proposed.

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Corrections to Part I:

BERG et al. 2003 read: BERG et al. 2004 [see above as BERG et al. 2004 a]

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