

## On the nomenclature and syntaxonomy of the phytosociological survey “Die Wälder und Gebüsche Österreichs”: examples of the class *Piceetea excelsae* Klika 1948

PETER KUČERA & JÁN KLIMENT

Comenius University in Bratislava, Botanical Garden, workplace Blatnica, SK-038 15 Blatnica pri Martine 315; peter.kucera@rec.uniba.sk, kliment@rec.uniba.sk

---

Kučera P. & Kliment J. (2011): On the nomenclature and syntaxonomy of the phytosociological survey “Die Wälder und Gebüsche Österreichs”: examples of the class *Piceetea excelsae* Klika 1948. – Thaiszia – J. Bot. 21: 85-92. – ISSN 1210-0420.

Abstract: This paper deals with nomenclatural proposals by the recent Austrian phytosociological survey “Die Wälder und Gebüsche Österreichs” (WILLNER et al. 2007). In respect of the International Code of Phytosociological Nomenclature, we re-evaluate the authors' approach to syntaxa names. An explanation is given of names assigned to the class *Piceetea excelsae* Klika 1948 referred to in that study, in rank of class (*Vaccinio-Piceetea*), order (*Piceetalia excelsae*, *Vaccinio-Piceetalia*, *Athyrio-Piceetalia*), alliance (*Abieti-Piceion*, *Vaccinio-Piceion*, *Piceion excelsae*), association (*Homogyno alpinae-Piceetum*, *Adenostylo alliariae-Piceetum*, *Equiseto sylvatici-Piceetum*, *Calamagrostio villosae-Piceetum*, *Laricetum deciduae*, *Pinetum cembrae*) and subassociation (automatic epithet *typicum*). We emphasize careful consideration of the rules of the ICPN and relevant literature, irrespective of the specific syntaxonomical approach adopted. The associations *Adenostylo alliariae-Piceetum* Hartmann 1953 and *Fago-Piceetum* Hartmann 1953 are lectotypified.

Keywords: Austrian forests, International Code of Phytosociological Nomenclature, *Picea abies*, *Vaccinio-Piceetea*, syntaxonomy.

---

### Introduction

An extensive and detailed survey of Austrian forest and scrub plant communities was published in 2007 thanks to comprehensive work by Austrian

phytosociologists (WILLNER et al. 2007). With phytocological tables included, the publication is a considerable breakthrough/progress in comparison with an earlier version of a syntaxonomical overview of the forests and scrub of Austria (MUCINA et al. 1993).

Particular attention was devoted to the nomenclatural evaluation of syntaxa names (cf. WILLNER 2007). However, some of the nomenclatural proposals included seem to be questionable in the view of the International Code of Phytosociological Nomenclature (WEBER et al. 2000). The goal of this paper is to comment on the problematic issues with emphasis on the *Picea abies* syntaxa and related communities. Several syntaxonomical notes are also added.

## Methods

Comments on nomenclatural proposals and syntaxonomical evaluation are arranged in descending order by nomenclatural rank of particular syntaxa of the class *Piceetea excelsae* Klika 1948 (syn.: *Vaccinio-Piceetea* Br.-Bl. in Br.-Bl. et al. 1939 p. p. min., nom. inval.). Author citations of specified syntaxa names from the survey by WILLNER et al. (2007) are not attached: name forms and contents are adopted as they are in that study. Otherwise, author citations are attached. Citation of the third edition of the International Code of Phytosociological Nomenclature (WEBER et al. 2000) is abbreviated as ICPN.

## Results and discussion

### Rank of class

Under the name of the class *Vaccinio-Piceetea* (WILLNER in WILLNER et al. 2007, p. 237), it is indicated that the nomenclatural type (lectotype) of the class was designated by JIRÁSEK (2002). Original diagnosis of the class, as given by BRAUN-BLANQUET et al. (1939), involves two subordinate units: orders *Vaccinio-Piceetalia* and *Gaultherio-Piceetalia*. The latter is a nomen nudum (ICPN Art. 2b → Art. 8), so *Vaccinio-Piceetalia* Br.-Bl. in Br.-Bl. et al. 1939 might be labelled as a holotype or automatic lectotype in the terms of Art. 20 of the ICPN. However, the order *Vaccinio-Piceetalia* Br.-Bl. in Br.-Bl. et al. 1939 was not validly published (nom. inval., Art. 2b), as the manner of the creation of the name does not correspond to the rules of the ICPN (Art. 3m → Art. 25, paragraph 1) (cf. KUČERA 2010a). Consequently, the class name *Vaccinio-Piceetea* Br.-Bl. in Br.-Bl. et al. 1939 was not published validly (Art. 2b). It is proposed that the name *Piceetea excelsae* Klika 1948 should come into use instead.

### Rank of order

Similar to the above is the situation with the order *Piceetalia excelsae* (WILLNER in WILLNER et al. 2007, p. 237). One of two subordinated alliances, *Piceion excelsae* (cf. PAWŁOWSKI et al. 1928), should be treated as an automatic lectotype according to ICPN Art. 20, not as the lectotype chosen by JIRÁSEK (2002). The order *Vaccinio-Piceetalia* (EXNER 2007, p. 184) should be listed

instead as a nomen invalidum (Art. 2b; see above). Likewise, the preferred valid form of the order name *Athyrio-Piceetalia* (EXNER 2007, p. 184) is *Athyrio filicis-feminae-Piceetalia* Hadač ex Hadač et al. 1969 (KUČERA 2010a).

### **Rank of alliance**

(1) The alliance name *Abieti-Piceion* (WILLNER in WILLNER et al. 2007, p. 237) was proposed as a nomen conservandum, namely against the unknown and unused name *Abietion albae* Issler 1931. As one can see from the syntaxonomical evaluation of “coniferous” *Abies alba* communities in a recent Austrian survey (EXNER 2007), the authors follow the concept of their inclusion among (or into) *Picea abies* syntaxa. However, this is not case of some other European classifications (RIVAS-MARTÍNEZ 1987, HUSOVÁ 2000, HUSOVÁ & MORAVEC 2000, JIRÁSEK 2002): syntaxonomical evaluation of *Abies* syntaxa has still not yet been settled. Therefore it is questionable whether the proposal to conserve the name *Abieti-Piceion* (WILLNER in WILLNER et al. 2007, p. 237) is premature, even though *Abietion albae* Issler 1931 should ideally not be used.

Moreover, (*Abies*-)*Picea* forests of the montane zone of the Alps, separated by BRAUN-BLANQUET et al. (1939) into suballiance *Abieti-Piceenion* Br.-Bl. in Br.-Bl. et al. 1939, should not be easily associated with so-called *Abies* communities outside the Alps. As concerns the examples of German *Picea-Abies* syntaxa (cf. OBERDORFER 1957), it can be seen that they contain more rather than less *Fagus sylvatica*, as rendered by OBERDORFER (1957, p. 507) in the chapter subtitle: “Tannenwälder (Fichten-Buchen-Tannenwälder)”. Accordingly, some Western Carpathian *Abies* stands were differentiated as separate associations (cf. MUCINA et al. 1985, JAROLÍMEK et al. 2008). Recent field research has proved that their “beechless” character (often with abundant *Picea abies*) is artificial, and secondary (KUČERA 2008a, 2009a, b, 2010b). Consequently, it should be made clear whether natural *Abies alba* stands not allied with *Abies-Fagus* communities of the class *Carpino-Fagetea* (Br.-Bl. et Vlieger in Vlieger 1937) Passarge et Hoffman 1968 (syn. *Querco-Fagetea* Br.-Bl. et Vlieger in Vlieger 1937 p. p.) are found in Slovakia at all.

Unlike the Austrian authors, we do not consider suballiances *Abieti-Piceenion* and *Galio-Abietenion* (WILLNER in WILLNER et al. 2007, p. 238) as extensively identical, namely for differences of the original authors’ concept (cf. KUČERA 2008b) and content of those syntaxa and their subordinated units as given by BRAUN-BLANQUET et al. (1939) and OBERDORFER (1957). In terms of the case of Western Carpathian’s secondary *Abies* stands (see above), the idea of recent field research on German *Picea-Fagus-Abies* mixed forests (cf. OBERDORFER 1957, 1962), with emphasis on the original occurrence and abundance of *Fagus sylvatica*, is attractive. As proposed by KUČERA (2008b), suballiance *Galio-Abietenion* Oberdorfer 1962 should be evaluated as a nomen invalidum (ICPN Art. 2b). RIVAS-MARTÍNEZ (1987, p. 148) proposed raising the suballiance to an alliance as “*Galio rotundifolii-Abietion albae* (Oberdorfer 1962) Rivas-Martínez 1987”. Unfortunately (or fortunately?), reference to Oberdorfer’s work was not made, and the declared “typus” of the alliance, i.e., the association name *Pyrolo-*

*Abietetum* Oberdorfer 1957 (RIVAS-MARTÍNEZ 1987, p. 148), is a nomen invalidum (Art. 2b). The remaining possibility of a valid description of the new alliance *Galio rotundifolii-Abietion* Rivas-Martínez 1987 resides in the fulfilment of the rules of the ICPN (especially Art. 2b, Art. 3f). Such a syntaxon, comprising “*Abetales altimontanos alipino-pirenaicos*” (RIVAS-MARTÍNEZ 1987, p. 148), would have a limited connection with OBERDORFER’S (1957, 1962) “mixed *Picea-Fagus-Abies* forests”.

(2) The alliance *Vaccinio-Piceion* was proposed by the Austrian authors as a nomen conservandum and at the same time the name *Piceion excelsae* (WILLNER in WILLNER et al. 2007, p. 237) was assessed as misleading for the contemporary syntaxonomy of *Picea abies* communities, being created of one species name only. This proposed approach was explained in more detail in the chapter “Nomenklatorischer Anhang” (WILLNER in WILLNER et al. 2007, p. 220) and applied, for example, to the association name *Pinetum cembrae* (WILLNER in WILLNER et al. 2007, p. 241) as well. We suggest that this approach gives strong (and undeserved) emphasis to the form of name. “Names are only labels and, as such, they can never be wholly adequate... It is far more important to know exactly what is meant by a name than to find one that seems in every respect to be characteristic.” (ICPN, p. 740). Although one-species formation of syntaxa names for floristically and physiognomically more complex plant communities (especially forests) was used above all in the dawning of phytosociology, such formation is still acceptable today (ICPN, Art. 10). Application of such names is determined by their respective nomenclatural types only (ICPN, Art. 15), not by various authors’ intentions of later syntaxonomical revisions/overviews [cf. WILLNER in WILLNER et al. 2007, p. 239, paragraph 1]. Use of one-species syntaxa names in respect of the original concept, content and diagnosis cannot be the reason of the presupposed ambiguity arising from the form of their name, viewed as insufficient, misleading (WILLNER in WILLNER et al. 2007, p. 239), or senseless within particular syntaxonomical changes (WILLNER in WILLNER et al. 2007, p. 20). Thus, *Piceion excelsae* Pawłowski ex Pawłowski et al. 1928 is inseparably united with its holotype association and its lectotypified relevé (cf. WALLNÖFER 1993, p. 287). Moreover, the above-mentioned approach is at variance with one of the major principles of the ICPN – stability of nomenclature.

### **Rank of association**

(1) Similarly, the ICPN principle of priority was not taken into consideration within the association *Homogyno alpinae-Piceetum*, by authors considered as syntaxonomically synonymous with *Luzulo sylvaticae-Piceetum* Wraber 1963. The latter name was rejected (WILLNER in WILLNER et al. 2007, p. 239) as “too similar” to the name *Luzulo nemorosae-Piceetum* (Schmid et Gaisberg 1936) Br.-Bl. et Sissingh in Br.-Bl. et al. 1939 [= *Fago-Piceetum* Oberdorfer 1938?]. ICPN Recommendation 10C is a confirmation that such “similarities” are not to be banned from use.

(2) Another example of a questionable proposal for nomina conservanda is the case of *Adenostylo alliariae-Piceetum* Zukrigl 1973, which has been

suggested for conservation against: *Adenostylo alliariae* Kuoch 1954, *Asplenio-Piceetum* Kuoch 1954 and *Adenostylo glabrae-Abietetum* Mayer et Hoffmann 1969 (WILLNER in WILLNER et al. 2007, p. 238).

We maintain that this kind of proposal has its origin in the methodical approach of the authors (WILLNER et al. 2007, p. 38), who divide synonymous names into the categories "Syn." and "Inkl.". Although explication of the content of the latter category (WILLNER et al. 2007, p. 38) – limited to syntaxonomical synonyms – is correct, application of the "Inkl." category (EXNER 2007, p. 197, WILLNER in WILLNER et al. 2007, p. 238) seems to leave scope for selection of "wider" syntaxa names. This is against the rules of the ICPN (e.g. Art. 22): "Each syntaxon with a particular circumscription, position and rank has only one correct name, namely the earliest validly published one that is in accordance with the Rules." With fundamental regard of the stability of nomenclature, the oldest name is preferred, irrespective of its position (cf. ICPN Definition X), or its phytosociological (wide or narrow) range. Only exceptional nomina conservanda (Art. 52) are meant to preserve the stability of nomenclature as well, to avoid replacing well known validly published names in favour of long forgotten, unknown names published albeit validly, but never used, and discovered only from a detailed survey of literature sources.

However, this approach does not need to be applied in such basic works as those of KUOCH (1954) or BRAUN-BLANQUET et al. (1939; the case of *Soldanello-Piceetum*: WILLNER in WILLNER et al. 2007, p. 240). On the contrary, it seems that the authors (WILLNER et al. 2007) have proposed a rather larger number of nomina conservanda. The question of conservation of *Equiseto sylvatici-Piceetum* Šmarda 1950 against *Soldanello montanae-Piceetum* Volk in Br.-Bl. et al. 1939, or *Calamagrostio villosae-Piceetum* Hartmann et Jahn 1967, nom. inval. (Art. 25) against *Lophozio-Piceetum* Volk in Br.-Bl. et al. 1939 is commented upon in detail by KUČERA (2010a, 2011).

We see proper use of the category "Inkl." in the older overview of Austrian forests and scrub (MUCINA et al. 1993: cf. MUCINA 1993): i.e., in the sense of the ICPN's "corresponding names"; cf. "Nom. corresp." of WILLNER et al. (2007: 38). Synonymy categories of MUCINA (1993) were followed also in a series of monographs "Plant communities of Slovakia" (cf. VALACHOVIČ 1995), namely in the differentiation of "Syn." [= nomenclatural, homotypical synonyms] and "Syntax. syn." [= syntaxonomical, heterotypical synonyms]. However, such denomination is questionable by reason that both syntaxonomical and nomenclatural synonyms are only subgroups of "synonyms" in general. The label "Syn." for nomenclatural synonyms only (MUCINA 1993, VALACHOVIČ 1995, WILLNER et al. 2007) is not in accordance with the given restriction and should be replaced by the clearer direct denomination "Nomencl. syn."

(3) The name *Adenostylo alliariae-Piceetum* Zukrigl 1973 was proposed for conservation against the homonymous name *Adenostylo alliariae-Piceetum* Hartmann 1953 (WILLNER in WILLNER et al. 2007, p. 238). Assumption of content homonymy would be correct when one takes into consideration two later publications by Hartmann (HARTMANN 1959, HARTMANN & JAHN 1967). By

contrast, an earlier monograph by this author (HARTMANN 1953: Anhang, p. XIII) also specified relevé material included in the association *Adenostylo alliariae-Piceetum* Hartmann 1953, i.e., *Luzula sylvatica* facies of the association *Luzulo nemorosae-Piceetum* (Schmid et Gaisberg 1936) Br.-Bl. et Sissingh in Br.-Bl. et al. 1939 (cf. KUČERA 2011). For nomenclatural purposes, a nomenclatural type should be set:

*Adenostylo alliariae-Piceetum* Hartmann 1953

Nomenclatural type: BARTSCH & BARTSCH (1940), p. 126, tab. 21, rel. 11, lectotypus hoc loco.

There is no need for conservation of the name *Athyrio alpestris-Piceetum* Hartmann ex Hartmann et Jahn 1967 against *Adenostylo alliariae-Piceetum* Hartmann 1953 (cf. WILLNER in WILLNER et al. 2007, p. 240). However, the name *Adenostylo alliariae-Piceetum* Zukrigl 1973 is a later homonym of the association name *Adenostylo alliariae-Piceetum excelsae* Březina et Hadač in Hadač et al. 1969 from one of the well-known basic vegetation studies of the Western Carpathians written by HADAČ et al. (1969) in German. We do not consider the proposed conservation of *Adenostylo alliariae-Piceetum* Zukrigl 1973 to be adequate.

Similarly, the statement by KUČERA (2009b, p. 26) on the name "*Fago-Abieti-Piceetum/Fago-Piceetum* Hartmann 1953" should also be corrected. The latter form of the name was used in the final part of the overview (i.e. HARTMANN 1953: Anhang, p. XII): it is not a nomen nudum as the name was accompanied there by a reference to sufficient original diagnosis:

*Fago-Piceetum* Hartmann 1953, nom. illeg. (Art. 31)

Nomenclatural type: OBERDORFER (1938), p. 244, tab. 24, rel. 4, lectotypus hoc loco.

(4) The proposal of *Laricetum deciduae* for a nomen ambiguum (WILLNER in WILLNER et al. 2007, p. 241) should be considered a premature decision as one work of false application was listed. The verdict of a nomen ambiguum should be expressed only when all the available ways to make proper use of the name have been exhausted.

### **Rank of subassociation**

The proposal of the automatic subassociation epithet "*typicum*" (WILLNER in WILLNER et al. 2007, p. 220) is in principle correct, however, in terms of the stability of nomenclature when applied to recent names only. A definite term (not earlier than 2007?) should be given in a future edition of the ICPN.

Finally, we would like to stress the immense importance of "Die Wälder und Gebüsche Österreichs" (WILLNER et al. 2007). The monograph shows what Austrian forests and scrub look like "in numbers" as well. The comments made above are intended only to draw attention to minor problematic issues proposed by the authors.

## Acknowledgements

We would like to thank Dr. Wolfgang Willner for specification of the authorship of the chapter "Nomenklatorischer Anhang" and to Prof. František Krahulec for providing a more complete version of the work of HARTMANN (1953). This work was supported by project grant VEGA 2/0059/11.

## References

- BARTSCH J. & BARTSCH M. (1940): Vegetationskunde des Schwarzwaldes. – Pflanzensoziologie 4/10: 234 pp.
- BRAUN-BRANQUET J., SISSINGH G. & VLIÉGER J. (1939): Prodromus der Pflanzengesellschaften. Fasz. 6. Klasse der Vaccinio-Piceetea (Nadeholz- und Vaccinienheiden-Verbände der eurosibirisch-nordamerikanischen Region). – Comité International du Prodrome Phytosociologique. [124 pp.]
- EXNER A. (2007): Piceetalia Pawł. 1928. – In: WILLNER W., GRABHERR G. (eds), DRESCHER, A. et al.: Die Wälder und Gebüsche Österreichs: Ein Bestimmungswerk mit Tabellen. 1 Textband, p. 184–208. Elsevier, München
- HADAČ E., BŘEZINA P., JEŽEK V., KUBIČKA J., HADAČOVÁ V., VONDRÁČEK M. et al. (1969): Die Pflanzengesellschaften des Tales „Dolina Siedmich prameňov“ in der Belaer Tatra. – Vegetácia Č.S.S.R., B 2: 344 pp.
- HARTMANN F. K. (1953): Waldgesellschaften der deutschen Mittelgebirge und des Hügellandes: Nach ihren wichtigsten soziologischen und standörtlichen Merkmalen in einer vorläufiger Übersicht zusammengestellt. – Umschaudienst Forschungsausschusses Landschaftspflege Landschaftsgestalt. Akad. Raumforsch. Landesplan. 4–6: 139–182, I–XIV, (1–21).
- HARTMANN F. K. (1959): Q. Naturnahe Waldgesellschaften Deutschlands in regionaler und standortökologischer Anordnung (mit Ausnahme des Alpengebietes). – In Müller, R. Grundlagen des Forstwirtschaft, p. 765–790. M. & H. Schaper, Hannover. Sonderabdruck.
- HARTMANN F.-K. & JAHN G. (1967): Ökologie der Wälder und Landschaften. Band 1. Waldgesellschaften des mitteleuropäischen Gebirgsraumes nördlich der Alpen: Tabellen, Grundlagen und Erläuterungen. – Gustav Fischer, Stuttgart. [2 vols]
- HUSOVÁ M. (2000): Podsvaz: Galio-Abietenion Oberdorfer 1962. – In: MORAVEC J. (ed.), HUSOVÁ M., CHYTRÝ M. et al.: Přehled vegetace České republiky. Svazek 2, Hygrofilní, mezofilní a xerofilní opadavé lesy, p. 178–184. Academia, Praha.
- HUSOVÁ M. & MORAVEC J. (2000): Svaz: Luzulo-Fagion Lohmeyer et Tüxen in Tüxen 1954. – In: MORAVEC J. (ed.), HUSOVÁ M., CHYTRÝ M. et al.: Přehled vegetace České republiky. Svazek 2, Hygrofilní, mezofilní a xerofilní opadavé lesy, p. 184–201. Academia, Praha.
- JAROLÍMEK I., ŠIBÍK J., HEGEDUŠOVÁ K., JANIŠOVÁ M., KLIMENT J., KUČERA P., MÁJEKOVÁ J., MICHÁLKOVÁ D., SADLOŇOVÁ J., ŠIBÍKOVÁ I., ŠKODOVÁ I., UHLÍŘOVÁ J., UJHÁZY K., UJHÁZYOVÁ M., VALACHOVIČ M. & ZALIBEROVÁ M. (2008): A list of vegetation units of Slovakia. – In: JAROLÍMEK I., ŠIBÍK J. (eds), HEGEDUŠOVÁ K. et al. Diagnostic, constant and dominant species of the higher vegetation units of Slovakia, p. 295–329. Veda, Bratislava.
- JIRÁSEK J. (2002): Třída: Vaccinio-Piceetea Br.-Bl. in Braun-Blanquet, Sissingh et Vlieger 1939. – In: HUSOVÁ M., JIRÁSEK J. & MORAVEC J. Přehled vegetace České republiky. Svazek 3. Jehličnaté lesy, p. 18–86. Academia, Praha.
- KUČERA P. (2008a): Buk na severovýchode Popradskej kotliny. – Bull. Slov. Bot. Spoločn. 30/2: 213–226.
- KUČERA P. (2008b): Remarks on higher-ranked syntaxa with *Abies alba* in Central Europe: their concepts and nomenclature. – Hacquetia 7/2: 161–172. DOI: 10.2478/v10028-008-0009-0.

- KUČERA P. (2009a): Buk v Doline Siedmich prameňov. – Štúd. Tatransk. Nár. Parku 9 (42): 171–182.
- KUČERA P. (2009b): Some remarks on Slovak syntaxa of Galio-Abietenion and Vaccinio-Abietenion. – Acta Bot. Univ. Comen. 44: 21–32.
- KUČERA P. (2010a): Nomenclatural types of *Picea abies* syntaxa reported from Slovakia. – Biologia (Bratislava) 65/5: 832–836. DOI: 10.2478/s11756-010-0103-x.
- KUČERA P. (2010b): Remarks to Abietion albae and its syntaxa. – Acta Bot. Univ. Comen. 45: 3–12.
- Kučera P. (2011): Vegetačný stupeň smrečín v Západných Karpatoch: rozšírenie a spoločenstvá. – In press.
- KUOCH R. (1954): Wälder der Schweizer Alpen im Verbreitungsgebiet der Weißtanne. – Mitt. Schweiz. Anst. Forstl. Versuchswesen 30: 133–260. Sonderabdruck.
- MUCINA L., MAGLOCKÝ Š. (eds) et al. (1985): A list of vegetation units of Slovakia. – Doc. Phytosoc. N. S. IX: 175–220.
- MUCINA L. (1993): Nomenklatorische und syntaxonomische Definitionen, Konzepte und Methoden. – In MUCINA L., GRABHERR G., ELLMAUER T. (eds) et al. Die Pflanzengesellschaften Österreichs. Teil 1. Anthropogene Vegetation, p. 19–28. Gustav Fischer, Jena.
- MUCINA L., GRABHERR G., WALLNÖFER S. (eds), GEIßELBERCHT L., GRASS V., GUTERMANN W., JUSTIN CH. & WIRTH J. M. (1993): Die Pflanzengesellschaften Österreichs. Teil III. Wälder und Gebüsche. – Gustav Fischer, Jena. [356 pp.]
- OBERDORFER E. (1938): Ein Beitrag zur Vegetationskunde des Nordschwarzwaldes: Erläuterung zur vegetationskundlichen Karte Bühlertal–Herrenwies (Bad. Meßtschbl. 73). – Beitr. Naturk. Forsch. Südwestdeutschl. 3/2: 149–270.
- OBERDORFER E. (1957): Süddeutsche Pflanzengesellschaften. – Gustav Fischer, Jena. [XVIII, 564 pp.]
- OBERDORFER E. (1962): Pflanzensoziologische Exkursionsflora für Süddeutschland und die angrenzenden Gebiete. Systematische Übersicht der süddeutschen Vegetationseinheiten (Assoziationen und höhere Einheiten), p. 19–42. – Eugen Ulmer, Stuttgart.
- PAWŁOWSKI B., SOKOŁOWSKI M. & WALLISCH K. (1928): Die Pflanzenassoziationen des Tatra-Gebirges. VII. Teil. Die Pflanzenassoziationen und die Flora des Morskie Oko-Tales. – Bull. Int. Acad. Polon. Sci., Cl. Math., Sér. B., Sci. Nat. Suppl. II.: 205–272.
- RIVAS-MARTÍNEZ S. (1987): Memoria del mapa de series de vegetación de España 1 : 400.000. – Icona, Madrid. [268 pp.]
- VALACHOVIČ M. (1995): Úvod. – In: VALACHOVIČ M. (ed.), OĽAHEĽOVÁ H., STANOVÁ V. et al. Rastlinné spoločenstvá Slovenska. 1. Pionierska vegetácia, p. 7–10. Veda, Bratislava.
- WALLNÖFER S. (1993): Vaccinio-Piceetea. – In: MUCINA L., GRABHERR G., ELLMAUER T. (eds) et al. Die Pflanzengesellschaften Österreichs. Teil III. Wälder und Gebüsche, p. 283–337. Gustav Fischer, Jena.
- WEBER H. E., MORAVEC J. & THEURILLAT J.-P. (2000): International Code of Phytosociological Nomenclature. 3rd ed. – J. Veg. Sci. 11/5: 739–768.
- WILLNER W. (2007): Nomenklatur. – In: WILLNER W., GRABHERR G. (eds), DRESCHER A. et al.: Die Wälder und Gebüsche Österreichs: Ein Bestimmungswerk mit Tabellen. 1 Textband, p. 17. Elsevier, München.
- WILLNER W., GRABHERR G. (eds), DRESCHER, A. EICHBERGER, CH., EXNER, A., WILFRIED, R. F., GRABNER, S., HEISELMAYER, P., KARNER, P., STARLINGER, F., SAUBERER, N. & STEINER, G. M. (2007): Die Wälder und Gebüsche Österreichs: Ein Bestimmungswerk mit Tabellen. 1 Textband. – Elsevier, München. [302 pp.]

Received: March 17<sup>th</sup> 2011  
 Revised: November 09<sup>th</sup> 2011  
 Accepted: November 10<sup>th</sup> 2011