

Abstract

Boublík K. (2009): Vegetation of fir- and calcicolous beech forests of the Czech Republic. – Ms., 104 p. [PhD thesis; depon. in: Library of the Department of Botany, Faculty of Sciences, Charles University, Prague]

The thesis proposes Braun-Blanquet phytosociological classification of calcicolous beech forests and fir forests of the Czech Republic.

Calcicolous forests dominated by *Fagus sylvatica* (*Fagion*, *Cephalanthero-Fagenion*) were defined with the help of two approaches: (i) selection on the basis of correspondence of species composition with an expert delimited species group and (ii) the formalized and supervised Cocktail method. In the case of the Cocktail method, the definitions of associations were created by combinations of sociological species groups using logical operators. Dominance of single species was included in the definitions of associations. Only one association (*Cephalanthero-Fagetum*) was distinguished. This association usually occurs on limestone, calcareous sandstone and calcareous sandy marlite. However, it can be found also on basalt and phonolite. TWINSpan analysis distinguished three vegetation types within Czech calcicolous beech forests which are interpreted as subassociations of *Cephalanthero-Fagetum*: (i) *Cephalanthero-Fagetum seslerietosum caeruleae* occurring on shallow rocky soils with the frequent dominance of *Sesleria caerulea* and the presence of petrophytes, (ii) *Cephalanthero-Fagetum typicum* on dry, shallow soils with a significant proportion of light-demanding, thermophilous and calcicolous species and (iii) *Cephalanthero-Fagetum actaetosum spicatae* on deeper, sufficiently moist soils with abundant mesophilous, nitrophilous and acidophilous species. The most important factors affecting the vegetation variability are nutrients, temperature, moisture, light (revealed by Ellenberg indicator values), slope and exposition of sites to the south.

Coniferous forests dominated by *Abies alba* in the Czech Republic were classified with the help of the formalized and supervised Cocktail classification method. Three associations within two vegetation classes were distinguished: (i) *Vaccinio vitis-idaeae-Abietetum albae* (*Vaccinio-Piceetea*, *Piceion excelsae*) is an oligotrophic, species-poor spruce-pine-fir forest dominated by *Vaccinium myrtillus* in the herb layer occurring mostly on podzols. (ii) *Luzulo-Abietetum albae* (*Querco-Fagetea*, *Luzulo-Fagion*) is an oligo-mesotrophic spruce-fir forest characterized by the dominance of graminoids (*Luzula luzuloides*, *Calamagrostis arundinacea*) in the herb layer. It occurs especially on cambisols. (iii) *Galio rotundifolii-Abietetum albae* (*Querco-Fagetea*, *Fagion sylvaticae*, *Galio rotundifolii-Abietenion*) is a herb-rich mesotrophic fir forest with a significant proportion of nutrient-demanding species. *Galio-Abietetum* occurs mostly on cambisols. Soil nutrients and soil reaction (expressed by Ellenberg indicator values) were determined as the most important ecological gradients affecting the variation of the vegetation in these communities. Moreover, humus form and degree of soil hydromorphism recorded in field were revealed as important factors affecting the variability of vegetation in a regional study of fir forests from southeastern Bohemia.

When considering the origin of fir forests, certain studies indicate that these forests probably represent a vegetation type determined both by natural conditions and human impact. Human activities, such as litter raking, forest fragmentation and forest grazing, are probably the main cause of the suppression of beech and, simultaneously, they encourage the regeneration of fir. Preliminary results of analysis based on historical maps and geographical positions of recent relevés indicate that certain fir forests originated on abandoned fields and pastures and that, in comparison with beech forests, they are situated closer to human settlements. Nevertheless, the potential importance of human activities in the origin of fir forests does not play down their nature conservation value. On the contrary, fir forests represent a valuable part of historical Central European rural landscape and it is essential to protect this heritage.

Key words: *Abies alba*, broadleaved forests, Cocktail method, coniferous forests, ecological gradients, *Fagus sylvatica*, formalized classification, soil conditions

Statement of Original Authorship

I hereby declare that this thesis is my own work and that it contains no material previously published or written by another person. However, the papers included in this thesis are not only my work. In the preparation of these papers, I collaborated with David Zelený (Department of Botany and Zoology, Faculty of Sciences, Masaryk University, Brno), Petr Petřík, Jiří Sádlo, Tomáš Černý, Jiří Kolbek (Institute of Botany Academy of Sciences of the Czech Republic, Průhonice), Radim Hédl (Institute of Botany Academy of Sciences of the Czech Republic, Brno) and Wolfgang Willner (Vienna Institute for Nature Conservation and Analyses, Wien). My colleagues submitted their authorship statement to the Scientific Board for Botany of the Faculty of Sciences, Charles University, Prague.

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June 2009