

Hochschule Weihenstephan-Triesdorf | D-85350 Freising

Prof. Dr. Bohuslav Gaš
Charles University
Albertov 6
CZ-128 43 Praha 2
Tschechien

Freising, 16.12.2009

Dear Prof. Gaš,

I am herewith transmitting my evaluation of Mgr. Boublí k's thesis "Vegetation of fir- and calcicolous beech forests of the Czech Republic".

Yours sincerely

J. Ewald

Wald und Forstwirtschaft
Botanik und Vegetationskunde

Prof. Dr. Jörg Ewald
Tel + + 49-8161-71-5909
Fax + + 49-8161-71-4526
joerg.ewald@hswt.de

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Hochschule
Weihenstephan-Triesdorf
Hans-Carl-von-Carlowitz-Platz 3
D-85354 Freising
<http://www.hswt.de/fh/fakultaet/wf/professoren/ewald.html>

Report on Ph.D. thesis

Karel Boublík: „Vegetation of fir- and calcicolous beech forests of the Czech Republic”

Overall Assessment

The thesis consists of four publication manuscripts in English language, of which three have been published and one is in the process of peer review. One paper was published in the ISI journal *Preslia*, one in a Czech and one in a German peer-reviewed journal.

The thesis is partly based on the defendant's own field work, partly on extracts from the Czech national vegetation database. Field work involved Braun-Blanquet relevés of forest vegetation and determination of soil type and humus form in part of the plots. Standard methods of ordination (DCA, CCA), indicator species calibration (Ellenberg values) and numerical classification (TWINSpan) were used for analysis. The introduction presents unpublished results of constrained ordination (CCA) to demonstrate the synanthropy of *Abies alba* forests. Formalised classification follows the scheme developed by Milan Chytrý's Brno group, based on Brühlheide's Cocktail method. Three subassociations of *Cephalantho-Fagetum* are defined, and the system of Walentowski with three associations *Vaccinio-*, *Luzulo-* and *Galio-Abietetum* and their subassociations is applied to Czech *Abies alba* forests.

I consider the submitted thesis to be sufficient for the level of a Ph.d. degree and an appropriate for the defense. Methods are generally applied correctly and results contribute significantly to national vegetation classification. The studies might have profited from including data from outside the Czech Republic, from more direct gradient analysis and from a deeper consideration of vegetation history. Somewhere between monography and suite of modern research papers, the thesis does not realise the full potential of either, which is a general problem of descriptive vegetation studies. The thesis makes a specific contribution to formalised classification, including the comparison of methodological elements. The novel hypotheses on synanthropism of *Abies* presented in the introduction will require further testing.

Referee' s Questions

1. Is it useful to classify forest types at their distributional margins and how could a classification be based on a broader universe of investigation?
2. What are the respective roles of tree layer and total species combination in the circumscription of *Abies alba* vegetation types?
3. Which functional attributes of species do you consider crucial for the ecology of *Abies alba* vegetation?
4. Are there objective criteria for the validity of a vegetation classification and could they be used to choose the best alternative?

Technical Remarks

p.5 It is not generally true that CCA “ reveals the most important factors influencing ... species composition” . Instead CCA extracts the floristical variance attributable to the constraining variables that are entered, i.e. in Figs. 2 and 3 settlement distance and forest age. Explaining very low proportions of variance, these do not appear to be important factors.

p.21 The definition of diagnostic species is not clear and not reproducible. The exact criteria of Ellenberg values are not stated. The resulting list is not convincing. The list is not related to DCA results.

p.22/p.28-30 To justify choice of DCA (vs. PCA) length of gradient (as a measure for unimodality of species responses) should be reported. The intention of using position index as a covariate is not given; removing variation a priori is not generally useful in explorative analysis; it would be better to explore position-related patterns in diagrams, relate them to other factors and then interpret geographical effects.

The role of CCA is doubtful here; too few meaningful environmental variables are available; results are not reported in detail; it is surprising and not shown that DCA leads to the same result as CCA; variance explained by DCA is not reported.

The species ordination by DCA on the broad *Fagus* dataset would present a test for a priori selection of diagnostic species (see p.21).

p.23 This is not a comparison of formalised classification, but of formalised circumscription; in method 1 only relevé selection is formalised, TWINSpan classification is numerical but not formalised, whereas Cocktail defines formal classification rules for all vegetation types.

p.34-35/p.38-29 Some aspects to the comparison are not mentioned: Why were only 50 % of the Cocktail indicators included in the “38-group”? What is the effect of using cover in Cocktail, and only presence in “38-group”-approach? Why should the “38-group” result be preferred? Why should transitional relevés not be classified as subtypes of Mercurali-Fagetum and Luzulo-Fagetum, and Cephalanthero-Fagetum defined narrower as calcicolous-xerophytic?

p.81 Cover of *Abies* as a single criterion appears coarse and the cover threshold subjective. Suballiances and associations should have a distinct diagnostic species combination. This is also not consistent with the delimitation of *Cephalanthero-Fagenion*.

p.88 Stratification could remove important ecological variance, when different types of *Abies* forest are present in a grid cell; site types with clustered occurrence may even become undetectable.

p.90 ff. It is a shame that hygrophilous subtypes are not analysed in depth here; as the putative natural core of *Abies* forests their recognition is of supraregional significance and requires hygrophilous species groups.

Freising, 16.12.2009

Prof. Dr. Jörg Ewald