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OUR REF.

YOUR REF.

LEUVEN,

April 9th 2010

Dear Madam, Sir,

Please find below my evaluation report on the PhD thesis of Jaroslav Vojta.

"Imprints of History in Post-Agricultural Forests"

I judge the thesis of sufficient quality to allow the public defense.

Sincerely yours,

Olivier Honnay

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Imprints of history in post-agricultural forests

The PhD thesis of Jaroslav Vojta focuses on the effects of land use history on the vegetation and soil characteristics of secondary forests. The work takes advantage of the unfortunate forced depopulation of an area within the Doupovske hory mountains in W- Bohemia (Czech republic) in 1953, to establish al large military zone. As a consequence, spontaneous succession towards forests occurred on the abandoned meadows, pastures and arable land. The current result of these land use changes is a forest complex consisting of a mosaic of ancient and secondary forest, perfectly allowing to study the effects of land use legacies on the current forest vegetation. The work consists of three chapters (papers I, II and III) and a concise introduction to the thesis. The first two chapters have been published in the peer reviewed literature. Although publication is not always a guarantee for high quality research, a successful peer review at least indicates that the research has been presented to, an approved by, a part of the scientific community.

The first paper of the work compares soil properties, terrain characteristics and vegetation between 8 abandoned villages and adjacent ancient forests. It is concluded that the former high nutrient input in the abandoned villages still affects soil properties, and that this is the main reason for clear vegetation differences between the ancient and recent forests. Also within the abandoned villages high variability in vegetation and soil properties is reported. The second paper explicitly tests the effects of former land use (arable land, meadow & pasture) on the current vegetation of the secondary forest. Most interesting is that an attempt is made to distinguish between the effects of former land use on the one side and naturally occurring abiotic differences between the sites on the other. The conclusion is that the species composition of the post agricultural forests is most affected by abiotic conditions (e.g. the terrain shape index) which are not influenced by former land use. This may imply that much of the previously reported vegetation differences between secondary and primary forests may be due to natural abiotic variation. In the third and last paper there is a specific focus on the vegetation of abandoned wooded pastures and recently overgrown pastures. This is the only part of the PhD that introduces a landscape ecological perspective through quantifying distances to potential seed sources.

The thesis is excellently written and presents a very well performed piece of classical plant ecological work and vegetation science. As an external referee, however, I cannot judge the contribution of the PhD candidate to papers II and III where he is a co-author and not the first author.
I see mainly the following strengths in this PhD work:

i) The thesis is based on a very large field data set. More and more ecologists do not leave their office or laboratory anymore today, and I really appreciated that the author of this thesis also performed a large quantity of field work. It is my feeling that this field work, and especially the vegetation recording was performed very accurately. Additionally, the sampling schemes are appropriate.

ii) The authors of the papers demonstrate a very good knowledge of the scientific literature.

iii) The objectives of each of the three papers are always very nicely stated and elaborated.

iv) The land use history is very nicely reconstructed based on old maps and aerial photographs. This data is very well integrated in the analyses. I also liked the nice photographs and the very well presented maps.

v) The statistical analyses are well performed throughout, and the appropriate tests are used. The authors of the papers demonstrate good knowledge of a wide range of statistical techniques (CCA, TWINSPAN, DCA, RDA, Generalized mixed models, ANOVA, ANCOVA, Variation partitioning). Graphical presentation of the results of the multivariate statistics is of high quality.

vi) I very much appreciated the well performed GIS analyses in the work. The authors demonstrate that they are skilled in using Geographical Information Software and that they can use the derived data in a meaningful way.

Somewhat weaker aspects of the work are :

i) The very descriptive nature of the research. What I sometimes missed was a more process-based approach. For example, only in the last chapter, an attempt is made to include an explicit spatial landscape ecological variable such as distance to the potential nearest seed source in the analysis to explain current vegetation patterns in the secondary forests. Including these spatial variables in the other chapters too may have yielded more insight, for example, in the role of seed dispersal vs. recruitment limitation during secondary succession.
Another option could have been to include some experimental work, e.g. involving seed introduction experiments, in order to get more profound insight in the relative role of the local environment, the historical land

use and seed dispersal limitation on the colonization of the species. *My question to the PhD candidate at this point is whether he has considered such experiments, and how the set-up of these experiments could look like?*

ii)   A lot of scientific work has already been performed on the differences, and the ecological processes behind these differences, between the vegetation of primary and secondary forests. This is clear from the cited literature in the thesis. *Although this thesis gives us excellent insights in the situation in the selected study area, I wondered whether there are more generally valid conclusions that can be drawn from this work, conclusions that extend beyond the particularities of the Doupovske hory mountains. I wondered whether the candidate could summarize these possible, more generally valid conclusions regarding the legacies of ancient land use.*
More or less related to the former I would also like to know how the candidate would conceive further research on the impact of former land use on forest vegetation. *Where does he see the most important knowledge gaps, and how would does he perceive further research to solve these issues?*

To conclude, it is my opinion that the thesis of Jaroslav Vojta, is a nice piece of solid classical plant ecology and vegetation science. And I recommend to allow the candidate to the public defense of the thesis.

O. Honnay
Leuven, Belgium, April 10th 2010