Jaroslav Vojta: Imprints of history in post-agricultural forests
Review of Ph.D. thesis

The presented thesis describes vegetation, species and environmental variability of secondary forests developed in abandoned landscape. It consists of preface and three distinct papers published in international scientific journals and altogether, the study represents a consistent description of presented topic.

Generally: I consider the study of post-agricultural forests as a very difficult topic. In my opinion, it is almost impossible to generalize many results obtained from one area (Doupovské hory) and one time (50 years of abandonment). Observed vegetation represents a dynamic system, which may be influenced by a group of local factors (proportion and structure of ancient forests, local history of land use within villages, local environmental conditions). Therefore, I appreciate that all results are broadly discussed and compared with previously published papers.

On the other hand, the frame of published papers strictly restricts the problem to several questions and I did not find here answers on some others which appeared during my exploration of the text and which can be probably easily answered from yet sampled data – e.g. What is a proportion of alien species in post-agricultural forests of this region? Are there some differences in species traits? What is a diversity of post-agricultural forests and is the heterogeneity of environmental conditions comparable between sampled ancient and post-agricultural forests? These questions were briefly or partly commented in text, but their broader explanation would be helpful. However, the structure of the thesis limits any broader explanation.

All presented papers were carefully reviewed. Therefore, I have only several small comments and questions:

Paper I

The role of 17 relevés of ancient forests taken from older literature remains unclear for me, because the number of relevés sampled by the author would be also sufficient. It is known that plots sampled by different author might be a source of considerable bias.

There is an obvious disparity between Ellenberg indicator values for Acidity and directly measured water pH for Forests (Table 1). I don't believe that the value for 111 relevés ranged in interval [5.03, 5.07] when standard instrumental error is not usually less than 0.1-0.2 pH.

Interpretation of Fig. 2 would be better with passive projection of environmental variables, which are mentioned in the text as interpreters of the first and second axis. „The abandoned villages are shifted to the right on the first axis which most likely represents soil acidity…" – probably rather „soil basicity", because this part of the axis is occupied by thermophilous oak and oak-hornbeam forests.

Fig. 6 and 7: Why did you divide these species to two layers? It could have a sense to compare trees with their seedlings, but not in a current stage (tree and shrub layer). How can I understand the situation when *Fraxinus excelsior* in shrub layer has an opposite direction than in tree layer?

It was surprising for me that so high concentration of phosphorus appeared in samples of post-agricultural forests after 50 years of abandonment of villages. Is it affected by higher pH on such localities?

Paper II

I appreciate the used method of data stratification to reduce over-sampling. I believe it is important to avoid or reduce pseudo-replication effect. However, it is a well known fact that the distance from village centre plays a role in type and intensity of the land use. Are you sure that it couldn't influence results? What is a difference between meadow and pasture? Some meadows were for example grazed in the second part of growing season. Did you have only land use information form the year 1953?

Fig. 4 – Is the pattern of species distribution correct in case if some of presented species occurred in at least two relevés? Why *Prunus avium* prefers pastures and *Betula pendula* arable fields? The presence of species during secondary succession is influenced by many factors (including simply a chance). To interpret such trends, it is necessary to consider only species with 'higher' frequency. We could discuss what the 'higher' frequency means.

It would be interesting to know how many species (their proportion and which) were significantly influenced by previous land use in both abandoned villages separately.

Paper III

Is the line at Fig. 5 a linear regression of presented plots? If yes, is the ratio of plots with the cover less than 60 % and higher than 60 % (Fig. 5a) equal to 1? In other words, how can we believe that the line represents the relationship for **60 %** (70, 80 %) canopy? In addition, did you test the significance in difference of regression slopes? I don't believe that slopes at Fig. 5b and 5c are different and it would be interesting to know if the slope at Fig 5a significantly differs from zero.

The secondary succession in abandoned villages seems to be similar to the succession in abandoned quarries. These biotopes are very important for nature protection and many of them are protected by law, because the occurrence of endangered species in these habitats is significantly higher than in many other biotopes. However, I did not find (from presented papers) that abandoned habitats in surrounding of former villages could be interesting from this point of view. Can you summarize results for nature conservation?

Conclusion:

I can conclude that the thesis fulfills all necessary requirements and if it will be accepted by the whole commission, its author can obtain the degree Ph.D.

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