Review of the PhD theis of Jana Knappová, Prague, 2012

Submitted PhD thesis is an excellent contribution to understanding of dry-grassland species dynamics in the landscape, with important consequences to restoration ecology and dispersal ecology. Author considered a wide range of various aspect and collected many original data (including original data on seed production and dispersal traits for particular species), what has led to really nice thesis. In addition, all manuscripts are well-written, with all relevant informations about theoretical background, methodology and species identities and frequencies in the study system. It is my pleasure to reccomend this thesis for succesfull defence.

I have following questions and minute concerns to the content of particular chapters:

Generally, I really appreciate the effort to disentagle the effects of dispersal vectors from the effect of seed quantity. As author said, this is rare approach in current literature as it requires originally measured data on seed quantity. However, there is a small discrepancy between using the term dispersal in particular texts, sometimes *dispersal* is used only for the process how a seed travels through landscape (sometimes it is precised by advert *per se*, but sometimes not), sometimes it is defined in a wide sense including all factors that cause lack of seeds in a particular site. Sometimes a clear trichotomy is presented (dispersal *per se* versus seed abundance versus niche effects), but the boundary could not be so sharp: what is a case when seeds arrive but not germinate, or germinate but all seedlings die? To which extend is it a result of low seed abundance (e.g., only one seed arrives to a new site, germinates at randomly dies), species traits or biotic and abiotic interacions (niche control)? Similar terminological problem may affect dichotomy between *dispersal traits* and seed availability. Seed production is not a trait? The next inconsistency concerns the term *neutral*; I found this strange sentence: „*Being solely a result of neutral meachnisms rare species are more extinction prone ...*" I expect you mean *occurrence of rare species* in your system (and not existence of rare species in nature how the sentence implies), right? If yes, why do you think that the occurrence of rare species is *solely* (!) a result of neutral mechanisms and not a result of some biotic interactions (you noted mycorrhizis, or seemingly bad dispersal may be caused by great seedling mortality due to some habitat effect etc...). But these minute inconsistencies are not so important, I think it is clear what authors want to say and this my comment only illustrate that I really have only little to criticise.

In more parts you state that old fields and grasslands differ ecologically – you state that species not occurring in old fields are grassland specialists, that old fields act as a sink for grassland species etc. I think it could be more explained – how old fields differ ecologically from grasslands? In other words, how to distinguish between grassland specialist with good dispersal ability *sensu lato* (growing frequently in old fields) and generalist (growing there as well)?

Related question: in Chapter 4 you demonstrated that grassland specialists occur predominantly on edges (the result corresponding to some other studies, e.g. cited paper of Jongepierová et al.). When the site was ploughed there was a furrow at the margin – some soil material was shifted towards the centre of a field and some soil was eroded via this furrow. As a result, field margin often has more shallow soil with less macronutrients and with more close contact with bedrock. Could it be a case also for your system?

Chapter 1: Do you have an idea to which extend the large-scale climatic habitat characteristics PDSI in March, May and June (set as three different covariables) and geology *causally* affect species richness? If their effect is too shared with that of isolation (it is possible because all these factors are usually geographically structured, is it true in your data set?), than their inclusion as covariables may reduce unrealistically the effect of isolation.

Chapter 2: I realised you rather reccommend to sow, in restoration measures, grassland species into less populated (disturbed) plots. However, in one year disturbed patches did not support seedling recruitment. Is there some practical possibility to avoid this problem? Related question – if one would aim to sow dry-grassland specialists into plots already populated by generalist competitive grasses such as *Arrhenatherum elatius* or *Bromus inermis*, would you recommend to disturb the plot or not?

Chapter 3: Can you explain why the analysis of phylogenetic contrast was needed? I do not mean why it is being used generally, I mean why just in this study with concrete specific aim and concrete species involved.

You conclude that seed quantity is more important than seed dispersal traits. It is evident that when we will enlarge the geographical scale, the role of dispersal traits (vectors) will became stronger. Can you estimate at which geographical scale your result will be no longer valid?

You obtained excellent data set on seed quantities and dispersal vectors. Are you planning to utilise them also in some study on larger geographical scale focused on metacommunities rather than old-field succession? I think it would be excellent and important contribution to general ecology as well!

Congratulations to your excellent PhD thesis.

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