

Evaluation of the supervisor (Francesco de Bello) of the Master theses by Hana Dvořáková

Transgenerational effect in *Taraxacum brevicorniculatum*: test of a novel method of experimental plant DNA demethylation and its practical application in exploring the impact of maternal competition on progeny phenotype

I was very happy to interact with Hana on this master thesis (and on the bachelor one) and I am very happy of the final results obtained by the work of Hana in our team. As one reviewer stressed (actually the more critical one, see below) I also think the thesis exceeded the expectations for a Master thesis, also to the very good writing abilities shown by Hana, and therefore I definitely recommend the thesis for a defense.

The thesis includes an introductory part which has been almost completely written by Hana and which, to me, demonstrates a very good ability by her to understand the topic and techniques employed in this study and, in more general terms, in the field of plant epigenetics. I have been repeatedly surprised, in the thesis and in previous seminars, by the deep understanding that Hana developed on the specific genetic mechanisms involved in the phenotypic variations due to epigenetics. By far, now, I think she has mastered this topic possibly even better than other people in the lab with more research experience. This first introductory part of thesis is a clear example of Hana's understanding of the topic.

The thesis then includes two interconnected studies, which should ultimately result in two separate publications. The first study (test of a novel demethylation method) is almost ready for submission and the paper was written in approximately 50% by Hana (and particularly in methods and results) and the rest in collaboration with the members of the project and the supervisor. Again, due to Hana's good abilities in written English the first version of the paper did not undergo big modifications except the abstract which, as all supervisors know, is the most difficult part to write for students. In this study Hana ran most of the experiments and made most of the measurements, including methylation rates. In other words this was the main subject of her thesis where so she came in contact with, and applied successfully, different methodological techniques. During the experiment Hana did not realize that measuring root biomass was needed at the end of the test, during collection of material, in order to demonstrate the negative effect of the traditional demethylation approach compared to the novel one. Luckily enough we ran a parallel experiment (for the second study) from which data are used to fill this gap. While Hana has a great ability to deal with

conceptual, methodological, experimental and writing tasks, she still have some limits with the more statistical part of data analyses, for which she relayed greatly on the lab members. Data analyses is probably scaring her a bit, which is a pity, because being more independent on this aspect would make of her a very promising researcher. I would like to stress here (also in reply to the comment of one reviewer) that the title of a thesis mentions "test of a novel method...". We do not claim that we invented the method, which was applied (and published) for the first time by a student of Vit Latzel (with him). But in their paper these authors do not test whether the demethylation efficiency of the new method is comparable to the 'old' one, thus they effectively do not validate the method they propose, which is a task Hana's thesis accomplishes.

The second study is not yet ready for publication and the first text reporting these results has been written completely by Hana, with minimal input from co-authors (although the first author of this study will be probably Javier Puy, PhD student). So the thesis' text is the first (and quite good) text on this study, which actually shows Hana's abilities to synthesize nicely a research project into the form needed for modern science. In this study Hana helped considerably in the setting up of the experiment, in the sampling and processing of the samples. Then, again, she wrote basically all text in the thesis. Again, while her comprehension of the topic and the study is excellent, she left the data analyses mostly in the hands of other lab members. While I am completely convinced that positive interaction and niche differentiation is an essential ingredient for a good and productive coexistence (both in plant communities but also in the working environment of a research team) I still think that a slight increase in independence in this aspect of research would be beneficial to her, both if she continues or not into research.

In summary, I greatly appreciated working with Hana and I really appreciate her contribution to these projects. It would be a pity if Hana decides to stop research and I invite her to consider her future with some time, even if she would continues in another lab, of course.

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16.1. 2017

