Supervisor assessment

Author of thesis: Bc. Zuzana Šedrlová

Title of thesis: The effect of auxin herbicides on the regulation of endogenous auxin homeostasis in plants

Type of thesis: Master of Science

	Evaluation criteria	Grades						
		A	**B**	**C**	**D**	**E**	**F**	non-evaluable
1	Interest in the topic (frequency of discussions with the adviser, knowledge of the literature)		X					
2	independence during the thesis writing		X					
3	language and stylistic quality of thesis		X					
4	working activity	X						
5	manual skills, accuracy and reliability	X						
6	self-reliance within the experiments	X						
7	analysis and interpretation of experimental data		X					

Note¹: if impossible to apply, use "non-evaluable"
Note²: mark with "X"
Note³: final grade is based only on evaluable (A-F) items
*- select "Bachelor" or "Master of Science"

Grade (A-F)	B

Please, attach your comments and questions as well as reasons for your evaluation at the next page (pages)

The master thesis of Zuzana Šedrlová aimed at answering questions about the effect of auxin herbicides on endogenous auxin homeostasis in model plant organism of *Arabidopsis thaliana*. The basic idea of the whole project was to test dosage and time effects of several synthetic auxin herbicides (2,4-D, Dicamba, Picloram, Quinclorac) and native auxin (IAA) as a control on auxin endogenous levels. For this purpose, the effects of different auxin herbicides on primary root growth, on synthesis of IAA precursors, conjugation or degradation products in Arabidopsis seedlings and rosettes as well as on the expression of selected IAA metabolic marker genes were analyzed. In addition, obtained IC50 values of the different auxin herbicides were determined in primary root growth assays and were compared with previously published results. But the main part of the thesis was focused on the auxin metabolism as a one of key partners controlling auxin homeostasis on the cellular, tissue, organ and whole plant level.

Both the short introduction main project questions together with thesis aims are clearly and well formulated with well-focused questions and specified project goals.

Literature review is quite comprehensive, well-structured and provides sufficient details and background information though some chapters are concise, some info is mentioned several times in different context through the text and some important and recently published papers are not even mentioned, moreover some cited references are not included in the reference list. These facts together create the impression that the student did not invest enough time to read and understand all necessary literature or did not pay enough attention to it.

The methods part is well written and covers all necessary details including details on used chemistry, primers, kits, methods and techniques. Student tried to organized in the way to make clear and better understandable structure of next results and discussion chapters.

The experimental/results part is well organized and included all required details to understand the experimental set-up and all analyses, and I would point out here that it was quite challenging for the student to make clear all that complex data and combine them in understandable way with used methods even me personally I can imagine better informative system of headings and subheadings. All data are presented with clear figures, well-organized graphs with properly described axis, the only problem is with the legends that are often a bit short of information and mainly missing statistics on the data to indicate significant differences between dosage variants.

The discussion part in my opinion is little bit short and can be stronger in terms of connecting and discussing student's findings in the context of current and published knowledge and literature even that the number of relevant papers is limited, but the discussion at all is comprehensive and student provides good and some interesting own interpretations on results.
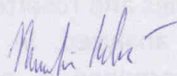
Conclusion part is trying to cover summary of answers to the main two questions from short introduction but somehow do not cover answers to the thesis aims. But this is just a matter of concern.

Overall, I would highlight that the whole thesis is well organized, with good proportion of all chapters, thesis is trying to answer on an interesting scientific topic in the field of auxin plant biology with possible future application potential. I would also mention that student learned many different methods and techniques covering areas of plant molecular and cell biology, plant physiology and analytical chemistry. Student did really good job in writing thesis in English what is always quite challenging issue for a non-native speaker. And finally, student successfully spent 6 months during her ERASMUS+ stay at one of the top plant biology research centers in UK, at the University of Warwick, what I believe will be important experience for her future scientific carrier.

And here are my two questions to the candidate:

1. Do you think that synthetic auxin can be recognize by plant auxin signaling system as an auxin like native molecule IAA? And what we already know about the TIR1/AFB5 auxin signaling receptors in concern to the auxin herbicides?
2. Are that all described herbicide effects in your experimental part of the thesis only direct or indirect, or in other words can we argue that auxin homeostasis disbalance is the only possible effect of auxin herbicides dosage in Arabidopsis?

Litomyšl, 24th May 2019:

Signature: Martin Kubeš

Conclusion: thesis recommended for defence