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Posudek školitele na doktorskou dizertační práci Mgr. **Markéty Hejníkové**

Reproductive diapause in males of the linden bug, *Pyrrhocoris apterus*

Markéta joined our laboratory a while ago after she had finished her master's studies and thesis with Dr. Magda Hodková. Therefore, not surprisingly, Markéta was very well-trained in delicate microsurgery experiments. Markéta's goal, when she started the PhD program, was to unravel neuroendocrine factors and identify anatomical routes to diapause regulation in the linden bug *Pyrrhocoris apterus*. To achieve that, we teamed up with Fernando G. Noriega, an expert in Juvenile hormone (JH). I was lucky to cover that collaboration with a Ministry of Education bi-lateral grant, Fernando was based in Florida at that time. The spoiler of this otherwise bright story was the fact that the JH quantification method stopped working for a while (for some problem with the equipment in Miami). Therefore, Markéta participated in our backup attempt to save our reputation at MŠMT. From this effort, we have the EFLa study, published here as chapter three I believe. From that time, Markéta also has some additional unpublished data, such as her experiments on ecdysis triggering hormone. Hopefully, that will be part of a descriptive paper in future.

The original topic came back to the fore once JH measurement was reestablished in Florida. Markéta successfully arranged sample preparation for JH measurement, which is, given the JH stickiness, demanding. Using this method, we could quantify JH in the linden bug, identify its titers during reproduction and diapause, and point to sex-specific levels. The ability to quantify JH became more and more important as we proceeded with different samples and, surprisingly, we identified this sesquiterpenoid also in males without *corpus allatum*. Furthermore, Markéta's data suggest that JH is present in Male Accessory Glands. We have touched that issue only very partially in the IBMB paper. At this point, we cannot tell whether JH is synthesized in this gland or just stored there. Neither have we any idea about biological significance for JH in MAGs in the linden bugs. Here, I would like to highlight Markéta's participation in a follow up experiment, where she prepared samples for transcriptome sequencing of Male accessory glands. We should know a bit more.

I do not want to talk in detail about Markéta's thesis, which consists of three published papers. I think it is reasonable amount of work and if you appreciate difficulty of research on non-model organism, it is actually a lot of work and a lot of results. What I would like to stress out at this point is the fact that Markéta did even more experiments which are not

presented in her thesis. She has participated in sample preparation which were used for Oxford Nanopore Technology transcriptome sequencing. Therefore, she is a co-author of our recent circadian paper too.

I appreciate Markéta's careful and precise experiments. And these are really fine experiments. However, I think that she should have read a bit more during her studies, and that she would have benefited from a bit more regular English training. In the end, I really do appreciate the effort, time, and responsibility which Markéta dedicated to writing her thesis. It is important to note that our faculty provides only one course on scientific writing and that is only very recent course.

On personal level, Markéta is a nice lab mate in the team who is willing to help other people, and not only in the lab. So, I would like to thank her for joining our group for a few years and wish her good luck in future.

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