



Statement of the supervisor on the doctoral thesis by Muhammad Aslam titled Aposematism and toxicity of Coccinellidae

The studies included in the thesis written by Mr. Aslam represent my long-lasting interest in various roles of conspicuous colouration and chemical defence of ladybirds. Consisting of six articles, it answers to five of six questions stated in the study plan.

The first question or goal to quantify the repellency of diverse ladybird species to ants was performed in the laboratory ant colony, but not replicated in a field trial as planned. We found that concentrations of extracts needed to prevent ants from drinking honey solution do not differ much among ladybird species and are not correlated with their colouration. Similar experiments should continue with other species in other countries, and can be easily done also in the home university of Aslam, in Peshawar, Pakistan.

The second goal to reveal real toxicity of ladybird chemicals to other organisms used water flea and showed clear differences among several ladybird species. However, the set of species available for this experiment only partially overlapped with the set of species of the ant experiment and a scavenging experiment, performed in another year. We have to complete these experiments with other ladybird species for a comparative study.

The third goal studied as a laboratory experiment under supervision of Petr Veselý confirmed that larvae and pupae of ladybirds are avoided by birds similarly as the adult beetles. This goal was widened to non-planned field and aviary experiments supervised by Katka Sam that confirmed the aposematic role of colouration of ladybird larvae.

The goal number four about changes of colouration with ageing of ladybirds showed long lasting accumulation of carotenoids in the ladybird elytra of the model species. It was also contributed by a Portuguese colleague Antonio Soares. We have more unpublished data about this phenomenon.

Although the experiments related to the fifth goal, the mating success of colour morphs of a polymorphic species, were also conducted, they did not result in an article, yet.

The last goal (number six) showed how much are ladybirds protected chemically and mechanically without contribution of their behaviour. This represent another very easy experiment that can be repeated in other countries including Aslam's home city for later wide comparison.

Aslam also learned methods for mass rearing of various insects and some advanced laboratory methods including gas chromatography. He wrote most parts of most articles



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included in the thesis. The only approach that he is not yet familiar with and is not independent for his future career is statistical analysis of the results. Otherwise, I believe he will continue in some of the experiments and will substantially contribute to the scientific production of his home university in Pakistan.

České Budějovice 12th February 2020

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