

Reviewer's Dissertation Thesis Report



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Dissertation Thesis Title: **Evolution of karyotype in selected groups of haplogyne and mygalomorph spiders**

Student: Ivalú Macarena Ávila Herrera

The doctoral thesis of Ivalú Macarena Ávila Herrera focuses on the evolution of karyotypes in selected species of spiders. The work is divided into a relatively short introduction to the topic, an extensive section of published results (a total of 5 publications), and a final summary in the form of discussion and conclusions (plus citations). A surprising aspect is the extensive list of publications where the student is the author, but which are not included in the doctoral thesis (people often change their doctoral thesis topics to report as many results as possible - I appreciate that the author did not do this). I may not be the best person to assess the formal aspects of the thesis, nor do I consider it important because the extent of the work (over 400 pages) and the published results more than suggest that this is a well-executed project. I will narrow my comments to a set of curious questions.

Number of evaluators have already corrected and discussed presented results. Anyway, it raises my first question. What was the most discussed or problematic point (if any) during reviewing process (no need to discuss all papers)? Did you consider writing a review on topic of thesis?

I was slightly alarmed by the acknowledgment of the Grant Agency of the Academy of Sciences of the Czech Republic, as this agency ceased to exist several years after my PhD

defense, but this may be related to the supervisor's diligence in citing all historical sources used during the experiments. Am I mistaken, or is this correct?

There is an erratum related to the work "Evolutionary pattern of karyotypes and meiosis in pholcid spiders (Araneae: Pholcidae): implications for reconstructing chromosome evolution of araneomorph spiders." What was it about?

I am somewhat surprised that the author did not use more various FISH probes derived, for example, from tandem repeats of the respective species. Is this due to the lack of information on arachnid genomes? How many arachnid representatives have been sequenced? And which representatives are they (and how are they selected)?

Some analyses would certainly be more informative using chromosome painting. Did the author consider this method? I know that microdissection is commonly used to generate probes, which is a relatively labor-intensive method. However, nowadays, especially in plants, the oligo painting method (designing chromosome-specific probes based on at least partial knowledge of the chromosome sequence) has prevailed. How is it with animals? Or specifically with the model organisms the author studies?

Although I thought I would skip some parts of the very extensive doctoral thesis (403 pages) that deal with, for example, the detailed systematics of spiders, which I am really not an expert on, the opposite happened. I was also attracted by the author's works that are not declared as part of the doctoral thesis (thematically different). I was particularly interested in the work on holocentric chromosomes (Insights into the karyotype and genome evolution of haplogyne spiders indicate a polyploid origin of lineage with holokinetic chromosomes). Is anything known about the origin of holocentrism in spiders? Are there any theories on this issue?

If the author had the opportunity to go back in time, would she do anything differently in carrying out the doctoral thesis, whether in terms of the concept of the work or the chosen approaches and methods?

In conclusion, I would like to state that the objectives of the scientific preparation have been fully met. The doctoral candidate has demonstrated the ability to conduct creative scientific work. I recommend the doctoral thesis for defense.

Date, 29.08.2024

Roman Hobza, Ph.D.