

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Aleksandra Bezmenova

PhD Program: Life Sciences

Title of Thesis: Evolutionary processes in hypervariable fungus *Schizophyllum commune*

Supervisor: Professor Georgii Bazykin

Co-supervisor: Professor Alexey Kondrashov, University of Michigan, USA

Name of the Reviewer: Mikhail Gelfand

I confirm the absence of any conflict of interest

Date: 01-11-2021



Reviewer's Report

The dissertation has a slightly non-traditional structure: after a brief introduction outlining the study (Ch. 1) and a literature review (Ch. 2), the author describes four different experiments, each with its own introduction, methods, results, and discussion (Ch. 3-6). However, as the overall study design is explained in the introduction, and the main results are recapitulated as conclusions (Ch. 7), such layout makes the reading even simpler, without the loss of the general research direction. The manuscript is well-written and easy to read.

The candidate studied a unique object, fungus *Schizophyllum commune* that is the most genetically polymorphic species, with additional advantages of linear gyphal growth and monokaryotic cells of known length.

This allowed the author to design some clever genetic experiments, that, in particular, measured how the level of selection acting on somatic and generational mutations and genome rearrangements depends on the competition. These studies were combined with the analysis of polymorphism in wild populations.

The methods are adequate and well described. The author's contribution to the wet part and the bioinformatics is clearly stated. The balance between the main text and supplements is well though-over.

The obtained results are actual and important. In particular, the candidate has demonstrated that the generational mutation rate in *S. commune* exceeds that of most plants and fungi (which partially explains the high level of polymorphism, although the comparison of the Russian and American populations has yielded some paradoxical results and hence the issue is not settled), and selection indeed acts on somatic mutations (as shown by the comparison of the mutation rates in thick and narrow tubes. As expected, homologous recombination predominantly occurs at areas with relatively low polymorphism level. Some of negative results described in Ch. 4 and 5 are not reflected in the Conclusions section; I think they are interesting enough (even if not final) to warrant being mentioned.

The author has published a first-author paper on the direct topic of the dissertation (in *Mol. Biol. Evol.*, IF=16,2), and one more first-author paper (in *Biology Direct*, IF=4.5). Hence the publication requirements of the Life Sciences Program are fulfilled. Nothing is said about conferences; this needs to be addressed during the defense.

Provisional Recommendation

I recommend that the candidate should defend the thesis by means of a formal thesis defense

I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report

The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense