

PhD Thesis Acceptance Report
Research Discipline Council of Biological Sciences
Jagiellonian University in Kraków

Candidate's name and surname: Evgenii Baiakhmetov

PhD Thesis Title: Inferring hybridisation and introgression processes within *Stipa* (Poaceae)

Thesis Supervisor: prof. dr hab. Marcin Nobis

Assistant Supervisor / Second Supervisor/ Co-supervisor (if applicable): dr Polina D. Gudkova

Reviewer: dr hab. Anna Jakubska-Busse, prof UWr

THESIS EVALUATION

1. **Scientific merit of the thesis**

a. Originality of the research (25-200 words):

The genus *Stipa* (Poaceae) is one of the very difficult taxonomically taxa, due to the large and poorly recognized range of phenotypic plasticity and the ease of forming hybrids. The taxonomy of genus *Stipa*, especially the number of species, remains controversial and much debated due to the fluent boundaries between the taxa. In the light of problem with determining the actual number of species, the integrative approach to the taxonomy of the genus *Stipa*, presented in Evgenii Baiakhmetov's PhD thesis, taking into account the phenomenon of hybridization and introgression, combining modern genetic methods with the analysis of morphometric data, seems to be an excellent solution. It should be emphasized that the doctoral dissertation of the Candidate's for the first time provides a large-scale genomic data comprising the first nuclear and mitochondrial genomes for resolving phylogenetic and hybridisation issues within *Stipa*. Therefore, I consider that the thesis comprehends original research and brings original quite relevant data on this topic.

b. Scientific merit of the chapters / articles (25-200 words):

The dissertation is based on three research papers that were published in the journal with regard to impact indicators and have undergone a rigorous process prior to being accepted for publication. The author of the dissertation presented his research in two articles published in Scientific Reports (IF 4.379) and one published in BMC Plant Biology (IF 4.14). The texts of all publications are clear and perfectly prepared, the introductions and discussions are consistent and necessary. In all of these papers, Mr. Evgenii Baiakhmetov is the first author and at the same time one of the corresponding authors. The authors' contributions at the end of the articles show that his role as an author in these publications was significant, both in designing and in analysing and interpreting the data. The candidate has performed field research, revised herbarium materials and performed the taxonomic identification, collected samples and performed the molecular analysis, as well as written and reviewing manuscripts. In my opinion, these publications prove the high scientific level of the doctorate.

2. **Substantial merit of the thesis**

(ability to introduce the research topic and clarity of research hypotheses, the choice of research methods and statistical tools for data analysis, presentation and critical analysis of

the research data, the ability to discuss research data and the theoretical background, clarity and quality of the conclusions) (25-200 words):

The research topic of Evgenii Baiakhmetov's PhD thesis is current and relevant in the context of up-to-date research in plant taxonomy. In the "Introduction" the author briefly introduced the topic of the thesis in a taxonomic context. It then presents i) The dissertation objectives, ii) Methodological framework, iii) Data acquisition, iv) Data analysis. Moreover, three published articles were presented in their original version. The goals and methods are clearly described and the author presents ideas and knowledge with sufficient theoretical background. The goals have been achieved and the research methods are adequate to the goals and hypotheses formulated in the work. The thesis has been completed with final conclusions and perspectives based on these three works. This is the first study of the taxonomically problematic genus *Stipa* to use Diversity Arrays Technology (DART) - a hybridization-based genotyping method that uses microarray technology to identify and type DNA polymorphism, that generated the statistically best-supported reconstruction of its phylogeny. The results support the hypothesis that hybridisation is a significant mechanism driving evolution in the genus *Stipa*. According to my opinion and experience, the doctoral thesis is of a very high standard. The topics of all articles are topical and relevant to modern research into the taxonomy of the genus *Stipa*.

3. **Layout and register**

(layout, register and the clarity of the language, the quality of the visual material etc.) (25-200 words):

The presentation and editorial standard of Evgenii Baiakhmetov's PhD thesis are also very high. The dissertation is generally very well written and the English language is fluent. The quality of the graphical material is also quite high. Tables and figures are clear, well designed and very professionally prepared, with good legends of figures.

4. **Critical notes**

As it is written about the *Stipa* taxonomy: "Generally, there are only few morphological characteristics with a persistent nature. Such a limited set of data complicates establishing reliable boundaries between species" (page 3). Wouldn't it be better to distinguish species complexes (aggregates) in the light of the high morphological plasticity of the genus *Stipa* than to describe individual species that are difficult to distinguish morphologically in practice?

5. **Final grade** (justification 25-200 words):

Overall, the PhD thesis by Evgenii Baiakhmetov represents an important scientific contribution to the validation and improvement of the *Stipa* genus classification system. It should be noted that the results of the Candidate's research have been published in well-known and highly rated scientific journals. Reported publications indicate that the candidate has achieved their goals, and the current results open the way to far-reaching research goals for the future. The thesis meets all the criteria of a doctoral dissertation. In my opinion, this thesis is ready to be defended before the appropriate committee.

I, hereby, declare that the reviewed PhD thesis by [Evgenii Baiakhmetov] meets the criteria pursuant to art. 187 of Act of 20 July 2018 The Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended) and request that the Research Discipline Council of Biological Sciences of the Jagiellonian University in Kraków accepts [Evgenii Baiakhmetov] for further stages of doctoral proceedings in the field of exact and biological sciences, in the discipline of biological sciences.

YES

I, hereby, request that the thesis is accepted with distinctions. Justification (25-200 words)

In my opinion, the scientific quality of PhD thesis by Evgenii Baiakhmetov, particularly important results of the three individual articles are clearly above average. Also, due to the very high quality and originality of the works and their publication in prestigious magazines, I strongly encourage you to grant him a distinction.

YES

Wrocław, 16th of May 2022

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date



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Reviewer's signature

INFORMATION FOR THE REVIEWER:

A digital copy should be sent to:
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A duly signed original should be sent to:

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