

HABILITATION THESIS REVIEWER'S REPORT

Masaryk University

Applicant

Mag.biol. Mag.biol. Dr.techn. Simon Karl-Maria Rasso
Rittmann, Bakk.biol

Habilitation thesis

Physiology and biotechnology of archaea

Reviewer

Prof. Dr. Ing. Petra Patáková

Reviewer's home unit, institution

Department of Biotechnology, University of Chemistry
and Technology Prague

Dr. Rittmann's habilitation thesis is based on 12 publications, to which he contributed significantly and which share a common field of research—the physiology and biotechnology of archaea. The thesis itself consists of a brief introduction to the topic, a description of the main methods used, a presentation of the most important results, their discussion, and a conclusion. The 12 publications mentioned are then listed in an appendix. The quality of the journals, in which the candidate has published, ensures that the articles have been peer-reviewed properly.

The topic of the habilitation thesis is well chosen and the field of study opens up a whole range of possibilities for the future, not only for research but also for industrial applications. The habilitation thesis is written in a readable form and demonstrates the candidate's professional erudition and insight. The published articles attached in the appendix clearly demonstrate the candidate's scientific contribution in the field. His contribution to the individual publications is documented too.

Overall, I consider the habilitation thesis to be very good.

Reviewer's questions for the habilitation thesis defence

- 1) In connection with your research into the production and excretion of amino acids, have you ever tested the production of dipeptides or similar substances (secondary metabolites) in archaea? Can it be assumed that dipeptides would form when using N₂ as a nitrogen source?
- 2) During methane production in a biogas plant, a limiting factor restricting the concentration of methane in biogas may be a lack of hydrogen for hydrogenotrophic methanogenesis. Can you imagine using archaea to boost hydrogen production in a biogas plant? I mean whether archaea could supplement the microbial consortium in dark fermentation, which is mainly carried out by bacteria. My question is based on the

fact that *Pyrococcus furiosus*, also belonging to archaea, is already used for hydrogenases production. So why not use it directly for hydrogen production?

Conclusion

The habilitation thesis entitled "Physiology and biotechnology of archaea" by Simon Karl-Maria Rasso Rittmann **fulfils** requirements expected of a habilitation thesis in the field of Microbiology.

Date: August 19, 2025

Signature: