

## **Dissertation Review Form**

### **-for members of the Dissertation Commission-**

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Please write a review of the dissertation taking the following criteria into account, where appropriate:

- General remarks
  - The significance and status of the dissertation in the field
  - The sufficiency and quality of the material
  - The adequacy of the methods used
  - The validity of results
  - The logic of the dissertation's structure
  - The knowledge and use of literature in the field
  - The project's contribution to the research area
  - The author's input into the achievement of the dissertation results
  - Language
  - The shortcomings of the manuscript
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**Name of the PhD Candidate** :Ms OLESYA KOLMAKOVA

**Planned Date of Graduation** : 23 September, year: 2015

**Title of the Dissertation:** MOLECULAR GENETIC IDENTIFICATION OF  
PLANKTONIC BACTERIA IN THE YENISEI RIVER BASIN AND EXPERIMENTAL STUDY OF  
THEIR BIOGEOCHEMICAL FUNCTIONS

Would you please elaborate upon your review with reference to the above mentioned criteria in the box below. Please add extra pages if needed

- **General remarks**

*PhD thesis of Olesya V. Kolmakova is dedicated to the study of species composition of planktonic bacteria of one of the greatest world rivers (the Yenisei River) and experimental study of some biogeochemical functions of these prokaryotic organisms.*

- **The significance and status of the dissertation in the field**

*Significance of the chosen issue, scale and scope of the work performed, validity of the scientific theses, fundamental and applied significance of the conclusions make the study of the candidate an outstanding event in the field of Hydrobiology.*

- **The sufficiency and quality of the material**

*I do not have any objections concerning the methodological part, the quality of observations, essence and design of the experiments or discussion of the results. Overall, the study is of a high standard. In the Introduction O.V. Kolmakova skillfully covers the importance of the problem, aim and objectives of the study. It is well shown that the species composition of river bacteria has not been investigated previously, not to speak of the functions of individual species of bacterioplankton. Only with the development and improvement of molecular methods of uncultured species identification in the end of the last century, a breakthrough was made in this field of biological science. At the problem statement stage the advantages of next-generation sequencing in biodiversity research of environmental communities were correctly realized. Cultivation of bacterial communities in experimental mesocosms was acknowledged the best solution for analysis of nutrients consumption by individual species of water bacteria. The work plan was carefully elaborated, and the conclusions emphasize the novelty and practical implications of the study.*

- **The adequacy of the methods used**

*The quality of the presented material assures that the dissertation is of high methodological quality, and the used methods are appropriate for the set objectives. It is worth to note, that a wide range of contemporary software is used, such as QIIME, STATISTICA and Community Analysis Package.*

- **The validity of results**

*The results are well-documented and reliable. The conclusions of the dissertation correspond to the stated aim and objectives and also to the obtained results.*

- **The logic of the dissertation's structure**

*The thesis has a traditional layout and consists of Introduction, three chapters, Conclusions, Acknowledgements and References. The chapters are concluded with precise Summaries. The text is 86 pages long, includes 14 illustrations of good quality and 9 informative tables. The References section is accurately formatted and includes 140 printed publications.*

- **The knowledge and use of literature in the field**

*Kolmakova O.V. demonstrates a good knowledge of literature. A balanced amount of classic and the most recent publications in the considered field of Hydrobiology was involved.*

- **The project's contribution to the research area**

*The scope of work is impressive: 240500 nucleotide sequences of the Yenisei River bacteria are taken into consideration, whereas previously molecular genetic investigations of the river were limited to 80 sequences. The dissertation is a completed scientific investigation. At the same time, it reveals interesting and promising prospects for future development. The study is primarily of a fundamental kind; nevertheless its results and conclusions have good prospects for practical applications. For example, they can be used in mathematical modeling and management of freshwater ecosystems.*

- **The author's input into the achievement of the dissertation results**

*Kolmakova O.V. demonstrated the ability to make relevant estimations and bright generalizations. The scientific novelty is also very prominently presented. For the first time Kolmakova O.V. studied the genetic diversity of water bacteria at a long section of a river (1800 km). NGS-based studies of riverine bacteria have never been conducted on such a long section. The Yenisei River plays a key role in economic activities at a huge territory of Siberian Federal District, where more than 13% of Russian population live.*

- **Language**

*The language is clear and correct. The description of methods and results is easy and interesting to read. A clear picture of the problem, material, results and scientific importance is created. Errors of style and grammar are almost absent.*

- **The shortcomings of the manuscript**

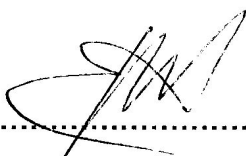
*The used terms "landscape" and "biome" are somewhat similar but not exact synonyms. The results of the dissertation give an opportunity for a more detailed discussion of freshwater ecosystem self-purification in different seasons than it was done in the study. Not all published papers are cited in the thesis. For example, there is no reference of a brilliant publication of O.V. Kolmakova in FEMS Microbiology Ecology in 2014.*

**Name of the Dissertation Commission Member :** .....

**Chair / Function :** .....

**Date :** .....

**Signature**

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*\* No signature required when submitted per email.*

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**Please send the completed form to the Head of the office of the Doctoral and Post-doctoral, Faculty Performance Evaluation Office Grigorieva O.A. e-mail: grigorieva\_00@mail.ru, tel. +7 (391) 206-22-62, address: 79/10 Svobodny pr., Room P6-16, 660041 Krasnoyarsk, Russia**