

Comparative analysis of transcriptome from different sympatric morphs of Dolly Varden *Salvelinus malma* from the Kronotskoe Lake

E.A. Konorov¹, V.O. Burskaya², I.V. Artyushin¹, V.A. Scobeyeva¹, G.N. Markevich³, N. Osman⁴, S.V. Nuzhdin⁴

¹ *Moscow State University, Moscow, Russia*

² *Skolkovo Institute of Science and Technology, Moscow, Russia*

³ *Kronotsky Nature Reserve, Yelizovo, Russia*

⁴ *Molecular and Computational Biology, University of Southern California, Los Angeles, USA*

* e-mail: skobei-khanum@yandex.ru

Key words: sympatric morphs, *Salvelinus malma*, transcriptome

Motivation and Aim: Some different morphs of Dolly Varden *Salvelinus malma* inhabit Lake Kronotskoe (Russia, Kamchatka). They differ more or less in head proportions, feeding, timing, and place of spawning, but can not be separated by mtDNA markers [1]. We obtained transcriptome from 5 morphs and tried to establish phylogenetic relations among morphs and compare the expression level of assembled transcripts.

Methods and Algorithms: Reads from each individual were assembled separately with Trinity. Only 17 specimen were assembled with reasonable quality and were taken for analysis. All transcripts were blasted against *Salmo salar* mRNA and only sequences with 1 reciprocal hit were selected and filtered for median coverage 40. We found 130 genes common for all 17 specimen and built phylogenetic tree with STAR. Differential expression were measured with edgeR. Reads were mapped on the assembly of specimen with best quality, transcript abundance were estimated with utilites from Trinity package and salmon. 117 transcripts were found over- or underexpressed (FDR < 0.005, logFC < 2) and were taken for analysis of GO enrichment.

Results: 117 transcripts differentially expressed between morphs were found, most of them with undefined onthology. Transcripts form two groups – one is overexpressed in dwarf morph and the other – in white, nosute and big-mouth forms. No transcripts of suitable quality were obtained from long-headed morph. Phylogenetic analysis of 130 transcripts produced moderately supported tree with separate branch including most transcripts of dwarf morph.

Conclusion: Only dwarf morph of Kronotskoe lake Dolly Varden demonstrates moderate genetic separation.

References

1. Senchukova A.L., Muge N.S., Pavlov S.D. et al. (2013) On the origin of charrs of the genus *Salvelinus* of the Kronotskoe Lake and their relationships with other charr populations of the Kamchatka peninsula. J. Ichthyol. 53:840.