INTERACTION OF THE SLEEPING CHIRONOMID WITH MICROORGANISMS*: "UCHI-SOTO"* IN THE WORLD OF ANHYDROBIOSIS.

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Origin of anhydrobiosis in the larvae of the sleeping chironomid *Polypedilum vanderplanki* represents unique example of set of evolutionary events in a single species, resulted in acquiring new ability allowing survival in extremely changeable environment. Complex comparative analysis of the genome of *P. vanderplanki* resulted in discovery of a set of features, including existence of the set of unique clusters of genes contributing in desiccation resistance. Surprisingly, in several cases, the genes mainly contributing to the formation of the molecular shield in the larvae are sleeping chironomid-specific and have no homology with genes from other insects, including *P. nubifer* – a chironomid from the same genus. *Polypedilum* midges are active bacterial feeders and at least several genes (including intrinsically disordered proteins) are likely to be arisen from horizontal gene transfer (HTG) from soil and water microorganisms. The genome of *P. vanderplanki* has low number of transposable elements. We currently assume that the majority of the genomic rearrangements increasing the chance of HTG is a result of desiccation-driven nuclear DNA damage. In average, number of obvious HGT in *P. vanderplanki* genome is moderate, but in many cases, the corresponding genes are highly active in the process of anhydrobiosis and likely to contribute to the adaptive processes (eliminating of consequences of excessive oxidative stress, preventing denaturation of the proteins, nucleotides metabolism, etc.) associated with anhydrobiosis. Another set of data from recent experiments with artificially sterilized larvae of P. *vandeprlanki*, suggesting that associated microorganisms contribute to the resistance of the rehydrating larvae to exogenous parasite fungi. Finally, there is an evidence that association with the larvae of *P. vanderplanki* has a potential to provide protection against complete desiccation to at least several species of microorganisms otherwise sensitive to water loss.