Effects of space station conditions on resting egg survivorship and parameters of life cycle in *D. magna*

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Dormancy is a widespread adaptation protected many species of animals and plants in harsh environmental conditions within months or even hundred years. This can be perspective for long-term transportation of ecosystem elements in space missions when renewable source of food and an efficient method to recycle oxygen are required. Effect of space station conditions such as space radiation, strong magnetic/electric fields and microgravity on resting stages has not been studies yet. We examined life cycle parameters in a cladoceran *D. magna* after one month exposition as resting eggs at the Russian segment of International Space Station **(ISS)**. The reference group were kept in laboratory at the same temperature (20^oC), moister (50%), and packed in the same material (polyethylene zipped bags). The samples from orbit in 10 days after delivering to the Earth were transported to laboratory for detailed analyses of their reactivation patterns, life span parameters and productive/reproductive potential.

We found statistically significant differences between *D. magna* from orbit and control in reactivation, maturation time and the first clutch size. Animals exposed at orbit demonstrated lower level of reactivation and less fitness to high productive conditions they were cultivated than in reference group. In offspring of ISS treated female about 50 % of males appeared and no one in control. Embryos of *D. magna* from orbit showed significantly higher sensitiveness to the fungal parasite (*Pitium daphniarum*) than embryos from the reference group. Environmental stress accepted by ISS-treated embryo, than transformed life cycle parameters in post-diapausing animals and finally as maternal effects influenced offspring reproduction. For animals treated during dormancy state such effects were obtained at first. Discovering of similar responses in other species exposed at space station conditions can be important for transportation and following cultivation at planetary stations of ecological life supporting system. Role of space radiation, strong magnetic/electric fields and microgravity in these resting stage transformations is discussed. This study was supported by Russian-Japan grant N 05-04-50914, RFBR grant 04-04-49121. VA got a fellowship from Max-Planck Institute of Limnology, Germany.