

The presented paper shall summarize process and results achieved during a behavioural study of cognitive abilities of rats, in particular of space orientation ability and balance ability. The space orientation ability was examined in the course of task of searching a hidden object in the Morris water maze whereas a modified beam balance test was to prove the latter ability. In the experiment there were employed 30-days old Wistar rats, further divided into the groups according to examined factors. Such factors comprise living environment of the rats, short-time hypoxic stress, anaesthesia applied and impact of order of an experimental day on the performance. Influence of the aforementioned factors on examined cognitive abilities was assessed both upon each of such factor separately and on the basis of mutual interaction among such factors.

The recorded results show high variability which is more apparent from the descriptive statistics and relatively often in such behavioural studies cases. Neither the t-test nor single-factor analyses of variance were able to prove the influence of either environmental factor or hypoxia factor on the cognitive abilities as statistically relevant. The influence of performance in dependence on a tested individual was ascertained as statistically relevant ( $p < 0,001$ ). When the multidimensional and multi-factor analyses of the total amount of data were employed, the following factors proved to be statistically relevant: order of an experimental day ( $p < 0.0001$ ), type of environment ( $p = 0.0072$ ) and level of hypoxia sustained ( $p = 0.0001$ ). In relation to the data gained by examination solely in the Morris water maze also the influence of interaction of environmental factor and hypoxia factor ( $p = 0.0215$ ) showed to be as statistically relevant.