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Effect of static magnetic field (2.1 T) on antioxidative defense system in *Drosophila subobscura* (Insecta, Diptera)

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Living organisms are highly complex dynamical systems which are inextricably linked to their environment. Each individual is under influence of a complex of ecological factors (both biotic and abiotic ones). Among them, omnipresent magnetic fields represent important abiotic factor, which could affect different biological systems. Considering the increase of electromagnetic pollution, as a consequence of modernization of life, additional magnetic fields (static and alternating) are common in the living environment. Therefore, the interest for studying the biological effects of magnetic fields of different characteristics has also been increased.

Magnetic fields can affect insects, causing a wide range of responses. Some of these seem to be partly mediated through free radical reactions that are able to alter cell defense system and breakdown tissue homeostasis. Enzymes (superoxide dismutase – SOD, catalase – CAT, glutathione S-transferase – GST, glutathione reductase – GR, ascorbat peroxidase and dehydroascorbate reductase) and non-enzymatic components (glutathione, ascorbic acid and α -tocopherol) constitute the major antioxidant defense system against reactive oxygen species in insects.

The main purpose of this study was to analyze the activity of antioxidative defense (SOD, CAT, and total glutathione content - GSH) in laboratory strains of *Drosophila subobscura* (Insecta, Diptera) originating from oak and beech forests after exposure to the North (N), namely South (S) pole of static magnet (2.1 T, VINCY Cyclotron magnet).

The experimental groups were: *sham*, exposed to the N and S magnetic poles. The first instar larvae were exposed to the magnetic field for 2h. The effect of N and S magnetic poles on antioxidative defense in the homogenates of *Drosophila* adults was measured.

Exposure to static magnetic field (N and S poles) decreased SOD activity and total glutathione content and increased CAT activity in *D. subobscura* originating from oak forest. In contrast, in *D. subobscura* originating from beech forest, the N and S magnetic poles increased SOD and CAT activity, as well as decreased the total glutathione content.

According to the results, it can be stated that examined *Drosophila* adults, which the first instar larvae were exposed to static magnetic field, have specific response to the N and S magnetic poles.