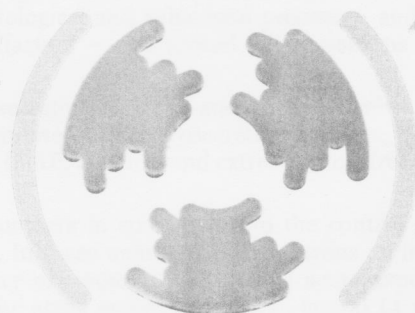


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THE RESPONSE OF A1 DORSO-MEDIAL AND L1 DORSO-LATERAL GYPSY MOTH NEUROSECRETORY NEURONS AFTER ACUTE EXPOSURE TO MAGNETIC FIELDS

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Abstract.

The effect of magnetic fields on the physiology of neuroendocrine system and developmental processes in insects are poorly examined. Neurohormones are synthesized and secreted in neurosecretory neurons. Insects' neuroendocrine system, via neurohormones, regulates the basic life processes and reacts quickly to environmental changes including magnetic fields effects.

The aim of our work was to overview specific and non specific responses to the acute effects of magnetic fields on different neurosecretory neurons. Neurohormones synthesized in A1 and L1 neurosecretory neurons represent the major regulatory proteins of all biochemical, physiological and behavioral processes, and trophic factors regulating the synthesis of juvenile hormones (allatotrophic factors – synthesized in A1 neurons and allatostatic factors – synthesized in L1 neurons) (Veelaert et al, 1995).

The morphometric changes (the size of neurosecretory neurons and nuclei, number of nucleoli in nuclei) and number of protocerebral dorso-medial A1 and dorso-lateral L1 neurosecretory neurons, were analyzed in *Lymantria dispar* larvae after a 3 day exposure to strong static (SMF, 235 mT) and extremely low frequency magnetic fields (ELF MF, 2 mT).

A decrease of all analyzed morphometric parameters in comparison to the control group of caterpillars were showed after acute exposure to SMF and ELF MF. In these neurosecretory neurons an increase in amount of large grained neurosecretory material was observed after exposure to SMF, while acute exposure to ELF MF led to a decrease in amount of neurosecretory material. The acute exposure of dorso-lateral L1 neurosecretory neurons to SMF did not influence all analyzed morphometric parameters, while ELF MF has increased the number and size of neurosecretory neurons. Significant decrease was observed in the size of L1 nuclei. After exposure to both magnetic fields in cytoplasm of L1 neurons a large amount of large grained neurosecretory material was present.

References:

- [1] Veelaert D., Tobe S.S., Yu G.G., Schoofs L., Loof A.D. (1995). Allatostatic and allatotrophic factors in the brain of desert locust *Scistocerca gregaria*. *Belgic Zoologist* 125, 243-249.