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МАТЕРИАЛЫ КОНФЕРЕНЦИИ И ШКОЛЫ

COMPARISON OF THE ENZYMOLOGICAL PARAMETERS OF CHOLINESTERASES OF THE NERVOUS TISSUE AND THE HOMOGENATE OF THE COTTON SCOOP HELICOVERPA (HELIOTHIS) ARMIGERA HBN

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One of the key problems of comparative neurochemistry is the comparison of the catalytic characteristics of enzymes of the nervous system of animals at different levels of evolutionary development, which is well illustrated by studies of cholinesterases (ChE) of various origins. For a number of years, comprehensive studies have been carried out on the properties of the ChE of the cotton scoop Helicoverpa (Heliothis) armigera Hbn.. Their caterpillars damage more than 120 species of cultivated and wild plants. The practical goal of such studies is to search for new highly selective ganglion blockers of cholinesterase data of these insect pests that do not adversely affect the cholinergic system of humans and mammals in the biocenosis. The cotton scoop revealed two cholinesterase – acetylcholinesterase (AChE) of the neural chain and butyrylcholinesterase (BChE) of the whole body. A comprehensive study of substrate-inhibitory specificity using modern concepts of inhibition by high concentrations of substrates, as well as the study of the antienzyme action of 57 irreversible phosphoroganic inhibitors, showed the unique enzymatic properties of scoop enzymes compared to cholinesterase of a number of arthropods and some mammals, which confirms a number of evolutionary concepts in development choline system and neurohumoral regulation of homeostasis. The study of their substrate specificity revealed, with a qualitative similarity of the enzyme characteristics of AChE and BChE, scoops with "reference" erythrocyte AChE and serum BChE, a distinctive peculiarity of the properties of these enzymes. So, scoop's AChE hydrolyzed butyrylthiocholine at a measurable rate, and for scoop's BChE, the kinetic parameters were independent of the structure of the acyl part of the substrate molecule. Phenylphosphonic acid derivatives turned out to be highly selective inhibitors.

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