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In-vitro study of esterase enzymes in relation to cypermethrin resistance in the larvae of the mosquito, *Culex pipiens*

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Double reciprocal plots of esterase activity in larval homogenate of *Culex pipiens* from susceptible and cypermethrin-selected generations toward 1-naphthyl acetate as substrate were carried out. These plots enable Michaelis - Menten constant (K_m) and maximum velocity (V_{max}) to be evaluated. Data of the kinetic constants for the hydrolysis of 1-naphthyl acetate (1-NA) indicated that the Michaelis - Menten constants, (K_m values) were 2.01×10^{-4} , 1.9×10^{-4} , 2.17×10^{-4} , 1.9×10^{-4} , 1.8×10^{-4} , 1.93×10^{-4} and 1.96×10^{-4} M for 1-NA hydrolyzing esterases for 1-naphthyl acetate hydrolyzing esterase from 4th instar larvae of *C. pipiens* homogenates of S-strain, cypermethrin-selected generations (G_0 , G_3 , G_5 , G_7 , G_9 and G_{10}), respectively. The corresponding V_{max} values were 11.05, 14.47, 23.87, 35.71, 72.99, 144.93 and 217.39 nmol substrate hydrolyzing/min/mg protein. The enzymatic half-life ($t_{0.5}$) values were 12.06, 9.1, 6.3, 3.69, 1.71, 0.92 and 0.62 (Min (mg protein/ml)), respectively. Values of K_m , V_{max} and $t_{0.5}$ obtained from the homogenate of S-strain and the corresponding values of cypermethrin-selected generations in relation to cypermethrin resistance were discussed.

Biography

Ezzeldin H A is a professor of pesticide science in the Department of Plant Protection, Faculty of Agriculture, Assiut University, Egypt. He completed his PhD project in 1997 at Chiba University, Japan in the field of pesticide toxicology. He is interested in biochemistry and the role of different enzymes in conferring resistance to different pests. He has published more than 20 research papers and attended about 8 international conferences.

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