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Effects of Cypermethrin on Isolated Frog Sciatic Nerve: An Ultrastructural Study

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Abstract: Aim: Cypermethrin is a potent representative of the type 2 pyrethroid insecticides. This study aimed to investigate the ultrastructural effects of cypermethrin on isolated frog sciatic nerve. Materials and Methods: 28 Rana ridibunda frogs were chosen and randomly divided into four groups (n = 7). After decapitation, sciatic nerves were isolated. All nerves except the control group were exposed to 2.5 µM cypermethrin in Ringer´s solution for 30 (group 1), 45 (group 2) and 60 (group 3) minutes, respectively. Tissue samples were evaluated by transmission electron microscope. Results: Degeneration in the myelin sheath and axon, decrease in the number of microtubules and neurofilaments, and evident damage in mitochondria were observed in all treated groups. Conclusions: Our findings suggest that cypermethrin affects both the myelin sheath and the axon in all groups, thereby impairing the nerve impulse conduction. In addition to these findings, notable degeneration of mitochondria and decrease in numbers of microtubules may also play an important role in this nerve conduction impairment.

Key Words: Cypermethrin, frog, sciatic nerve, ultrastructure

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