Toxicological Evaluation of Novel Butenolide Pesticide Flupyradifurone Against Culex quinquefasciatus (Diptera: Culicidae) Mosquitoes

Mohamed Ahmed Ibrahim Ahmed, Christoph Franz Adam Vogel

Abstract:

The impact of increasing resistance of mosquitoes to conventional pesticides has led to investigate various unique tools and pest control strategies. Herein, we assessed the potency of flupyradifurone, a novel pesticide, on fourth instar larvae of Culex quinquefasciatus Say. Further, we evaluated the synergistic action of piperonyl butoxide (PBO) and the octopamine receptor agonists (OR agonists) chlordimeform (CDM) and amitraz (AMZ) on the toxicity of flupyradifurone in comparison with sulfoxaflor and nitenpyram to increase their toxicity on Cx. quinquefasciatus. Results demonstrated that flupyradifurone was the most potent pesticide followed by sulfoxaflor and nitenpyram. Further, the synergetic effect of PBO, CDM, and AMZ was significant for all selected pesticides especially flupyradifurone. However, AMZ had the most significant effect in combination with the selected pesticides followed by CDM and PBO. The toxicity of the pesticides was time-dependent and increased over time from 24, 48, to 72 h of exposure in all experiments. The results indicate that flupyradifurone is a promising component in future mosquito control programs.

Keywords:

flupyradifurone, Culex quinquefasciatus, mosquito control, piperonyl butoxide (PBO), octopamine receptor agonists (OR agonists)

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