

Control of mosquitoes with selective insecticides: efficacy of two birational products (kinoprene and methoxyfenozide) on reproduction of *Culex pipiens*

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Abstract:

Mosquitoes are vectors of many human diseases and cause environmental nuisances. *Culex pipiens* L. (Diptera, Culicidae) represents the most important mosquito species in Algeria. Due to secondary effects caused by conventional neurotoxic insecticides, new molecules with low ecotoxicological risks are searched. Insect growth disruptors (IGDs) represent a new class of selective insecticides that interfere with endocrine-regulated processes relatively unique to insects. In this study, we investigated the effects of a juvenile hormone analog kinoprene (LC₅₀) administered separately or in combination with a molting hormone agonist methoxyfenozide (LC₂₀) on fourth instar larvae of *Cx pipiens*. Emergence success, sex-ratio and fecundity of adults of first and second generation were investigated. The morphological abnormalities were also mentioned. Single and combined treated larvae showed various morphological aberrations such as distorted mouthparts and air tube (siphon), deformed pupa, incapability for shedding the old cuticle hence failed emergence and larva-pupa intermediates. We report a significant change in emergence success only with kinoprene at its LC₅₀, in first and second generation; it was over two and three times lower than in control series respectively. These depressive effects were increased when kinoprene was applied in combination with methoxyfenozide. The sex-ratio for LC₅₀ of kinoprene was 2:1 against only 1:1 in controls. The number of eggs laid per female (fecundity) of *Cx. pipiens* derived from fourth instars larvae treated with kinoprene were affected. Moreover, combined treatment increased this parameter. Overall data suggested that kinoprene have potential as a biorational insecticide for controlling of mosquitoes, and when combined with a molting hormone agonist it induced marked depressive effects.

Keywords: Mosquitoes, Pesticides, Insect growth disruptor, Morphological aberrations Fecundity, Sex-ratio.
