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Insecticidal Activities of the Enantiomers of Asymmetric 1-[1-(6-Chloro-3-pyridyl)ethyl]-2-nitroiminoimidazolidine against American Cockroach, Cucurbit Leaf Beetle, Green Rice Leafhopper and Green Peach Aphid Following Injection, Dipping and Spraying

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Abstract:
The title compound Me-IMI has been reported to show enantioselectivity in terms of binding affinity and nerve blocking activity *in vitro*. Here we examined the behavior of the optical isomers *in vivo*. Each enantiomer was highly insecticidal when administered to the leaf beetle by dipping or the green rice leafhopper and peach aphid by spraying at concentrations of 1.6–8 ppm. The minimum lethal doses (MLDs in nmol) of the (*S*)- and (*R*)-isomers for the American cockroach following injection were also similar at 30 and 42, respectively, and these values dropped markedly to 0.93 and 0.83 on addition of the synergists piperonyl butoxide and NIA 16388. The MLD values of (*S*)- and (*R*)-nicotines were 490 and 320 without the synergists. For nicotine, the synergistic effect was small and these values were lowered only slightly to 310 and 160.

Keywords:
American cockroach, asymmetric chloronicotinyl insecticide, enantioselectivity, imidacloprid, nicotine, synergist

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