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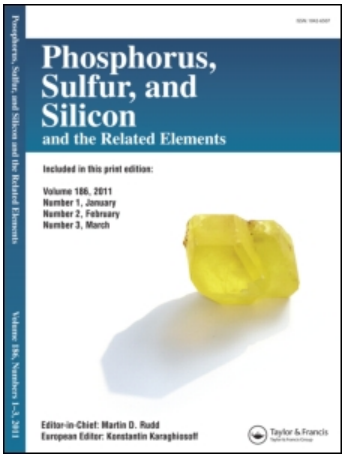

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Metabolism and Interaction with Esterases of O-Ethyl-S-(Methoxycarsonalmethylmercaptomethyl)Methylphospho-Nodithioate

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METABOLISM AND INTERACTION WITH ESTERASES OF O-ETHYL-S-(METHOXYCARBONALMETHYLMERCAPTOMETHYL)METHYLPHOSPHONODITHIOATE

T.A.MASTRYUKOVA, A.E.SHIPOV, G.V.ZHDANOVA, Yu.S.KAGAN, E.A.YERSHOVA, M.A.KLISENKO, G.A.ODOYEVA, G.F.MAKHAYEVA, and M.I.KABACHNIK
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Metabolism of an effective insecticide and acaricide $Me(EtO)P(S)SCH_2SCH_2COOMe$ (I) (I) in rat and American cockroach was investigated. For this purpose the metabolites of oxidative activation and hydrolytic detoxication of (I) - $Me(EtO)P(O)SCH_2SCH_2COOMe$ (II), $Me(EtO)P(O)SCH_2S(O)CH_2COOMe$ (III), $Me(EtO)P(S)SCH_2S(O)CH_2COOMe$ (IV) and $Me(EtO)$-$P(S)SCH_2SCH_2COOH$ (V) were synthesized.

A lower toxicity of (I) to mammals (LD_{50} 320 mg/kg, mise and 140 mg/kg, rats) compared to that of $Me(EtO)P$-$(S)SCH_2C(O)NHCH_2COOEt$ (its metabolism was studied earlier (2); LD_{50} 140 and 46 mg/kg) was shown to be accounted for not only by its easy carboxyesterase hydrolysis, but also by a high affinity of (I) and its metabolites (II) and (III) towards blood components. This affinity promotes the inhibition of erythrocyte AChE and thus the waste of the compounds at these sites of losses. The effect limits peneration of the inhibitors to brain and reduces their total toxicity. Metabolism of (I) in American cockroach proceeds similarly, but the main reason of its low toxicity (LD_{50} 350 mcg/g) is a rapid carboxylesterase catalyzed hydrolysis.

(1) T.A.Mastryukova et al., Izv. Acad. Nauk SSSR. Ser. khim., 1979, 673.
(2) Yu.S.Kagan et al., Izv. Acad. Nauk SSSR. Ser. biol., 1982, 242.

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