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KEY WORD: SODIUM NITRITE / METHYL PARATHION / METHEMOGLOBINEMIA / CHOLINESTERASE ACTIVITY
SUGALLAYA CHAROENSRI : SUBLETHAL EFFECT OF SODIUM NITRITE AND/OR METHYL
PARATHION IN CROSSBRED CATFISH (*Clarias macrocephalus* VS *Clarias gariepinus*). THESIS
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The sublethal effects of sodium nitrite and/or methyl parathion in crossbred catfish(*Clarias macrocephalus* vs *Clarias gariepinus*) were studied. Treatments consisted of control, sodium nitrite (6.25-150 mg/litre), methyl parathion (0.125-4.0 mg/litre) and the combination of 0.25 mg/litre methyl parathion and sodium nitrite (12.5-150 mg/litre). Brain and whole blood cholinesterase activities, methemoglobinemia and hematological changes were investigated in all crossbred catfish having been previously exposed to these chemicals for 24 hours. Significant decrease ($p<0.001$) in whole blood and brain cholinesterase activities were observed in all methyl parathion exposed catfish. There was good correlation ($r = 0.967$) between percent inhibition of whole blood and brain cholinesterase activities and the reduction of enzyme activity was also found to be dose dependent. No hematological changes were found in the methyl parathion treated groups. However, the groups exposed with sodium nitrite, percentage of hemoglobin in the methemoglobin form was increased significantly ($P<0.01$). Sodium nitrite had no effect on the activity of cholinesterase. At concentration up to 50 mg/litre, sodium nitrite caused a significant reduction ($p<0.05$) of hematocrit and hemoglobin and caused a significant decrease ($p<0.05$) in red blood cell number at concentration of 100 and 150 mg/litre.

The combined effect of 0.25 mg/litre methyl parathion and various concentration of sodium nitrite (25-150 mg/litre) was also studied. At highest concentration of sodium nitrite, the combination of sodium nitrite with methyl parathion resulted in significant increase ($p<0.05$) in methemoglobin formation. No significant difference ($p>0.05$) of whole blood and brain cholinesterase activities between the group treated with 0.25 mg/litre of methyl parathion and the group treated with sodium nitrite plus 0.25 mg/litre of methyl parathion. Compared with the control, the mixture of 0.25 mg/l methyl parathion and 75-150 mg/litre of sodium nitrite caused significant decreasing ($p<0.05$) of hematocrit and hemoglobin value. Moreover, at concentration up to 50 mg/litre of sodium nitrite caused a significant decrease ($p<0.05$) in red blood cell number.

The results from these studies showed that the intoxication from the two chemicals can cause also different physiological changes in crossbred catfish. The severity of sodium nitrite intoxication can be increased by methyl parathion exposure. It is possible that the reduction process of methemoglobin to normal hemoglobin could be inhibited by methyl parathion was also discussed.

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