

Thesis Title Effects of Thiamine and Riboflavin Deficiencies on
 DDT and Methyl Parathion Toxicities and on Changes
 in Drug Metabolism Induced by the Pesticides

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ABSTRACT

In many developing countries, including Thailand, deficiencies of vitamin B especially thiamine and riboflavin is still prevalent and considered one of the major public health problems in the poor agricultural community. Coincidentally, the population in these regions could also be exposed to various pesticides such as DDT and methyl parathion in their food and environment.

Research carried out in this study is designed to investigate the effects of exposure to DDT and methyl parathion on the xenobiotic metabolic/ and detoxification systems which is beleived to be the key step in the manifestation of action and/or toxicity. Moreover, the effects of DDT and methyl parathion on the above systems during thiamine and riboflavin deficiencies were also evaluated.

Xenobiotic selected for this study included: DMN,aminopyrine and aniline. Moreover, hepatic GSH content and GSH-S-transferase were also measured.

DDT pretreatment for 7 days decreased the low K_m of DMN demethylase I and aniline hydroxylase activities. DMN demethylase II responded differently, its activity was significantly increased after 3 and 14 days on DDT treatment. Aminopyrine demethylase and GSH-S-transferase were significantly increased after 3, 7 and 14 days DDT treatment. DDT had no effect on hepatic GSH content.

The effect of DDT treatment in thiamine deficient rats did not produce effect on DMN demethylase I and aniline hydroxylase, but DMN demethylase II, Aminopyrine demethylase, GSH-S-transferase and hepatic GSH content were significantly increased under this condition.

The combination of DDT treatment (1 day and 3 day) and riboflavin deficiency significantly increased DMN demethylase II and aminopyrine demethylase but had no effect on GSH-S-transferase and hepatic GSH content. DMN demethylase I and aniline hydroxylase activity were decreased under this condition.

The effect of methyl parathion treatment in thiamine deficient rats did not produce any effect on aniline hydroxylase, DMN demethylase I and II, GSH-S-transferase and hepatic GSH content but it decreased aminopyrine demethylase activity.

The combination of methyl parathion treatment in riboflavin deficient rat had no effect on DMN demethylase I and II, aminopyrine demethylase, aniline hydroxylase, GSH-S-transferase and hepatic GSH content.

LD_{50} dose of DDT was slightly decreased in thiamine and riboflavin deficiency but the LD_{50} dose of methyl parathion was slightly increased in thiamine deficiency and it was equally toxic to control and riboflavin deficiency.