Effect of mosquito larvicide Abate® on the developmental stages of the Asian common toad, *Bufo melanostictus*

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ABSTRACT

Exposure to chemical contaminants has been identified as a key factor causing widespread mortalities and malformations in amphibians world over. We examined the effect of exposure to commonly used mosquito larvicide, Abate® which has temephos as the active ingredient, on the Asian common toad, *Bufo melanostictus*, under laboratory conditions. The LC₅₀ values of 16.56 ppm and 17.03 ppm were obtained when one-day old tadpoles (Gosner stage 21-24) and one-week old tadpoles (Gosner stage 25) were exposed to Abate for two weeks, respectively. Chronic exposure to Abate at effective field concentrations used in mosquito control programmes (WHO recommended doses) had a significant effect on the survival of egg stage (Gosner stages 12-14), and one day old tadpoles but not on one week old tadpoles. Tadpoles exposed to Abate grew larger and had a longer larval period and the difference in the duration of larval period was statistically significant. Tadpoles also developed malformations such as rotation of bones, micromelia of the limb bones, hemimelia of femur, skin webbing in the hind limbs and ectrodactyly. Edemas were also observed in the exposed tadpoles. Exposure to all concentrations of Abate had a significant effect on the survival, growth and development of malformations in the early tadpole stages compared to the control group. The reduction in survival was not significant when older tadpoles of one week post-hatch were exposed, although they developed malformations and their larval period was prolonged significantly compared to the control group. Thus, the study shows that Abate is lethal to the early stages of the Asian common toad but the toxicity decreased as the tadpoles grow older.

Key words: temephos, amphibians, survival, growth, malformations