

Effects of Temperature on the Toxicity of M-Parathion, Chlorpyrifos, and Pentachlorobenzene to *Chironomus tentans*

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Abstract. This study examined the influence of temperature (10, 20, and 30°C) on the acute toxicity and accumulation of two organophosphate (OP) insecticides and a narcotic chemical to the midge (*Chironomus tentans*). OP insecticides used in this study included chlorpyrifos and m-parathion, and pentachlorobenzene was the chosen narcotic. Chlorpyrifos was the most toxic chemical tested, followed by m-parathion and then pentachlorobenzene. A positive correlation was found between temperature and toxicity for each of the chemicals tested. A reverse trend was noted for total OP insecticide body residues with decreased concentrations found at the higher temperatures. Pentachlorobenzene body residues remained constant at all temperatures. All three chemicals showed increased uptake rates at 20 and 30°C in comparison to 10°C. The noted decrease in midge body residues at the higher temperatures for the OP insecticides was contributed to increased biotransformation and elimination rates at the higher temperatures. Overall, temperature had a greater influence on OP toxicity than for pentachlorobenzene, and this may be due to accelerated biotransformation of the OPs to more toxic o-analog metabolites at the higher temperatures.