Akkarasiri Sangsawang 2014: Acute Toxicity of Carbosulfan and Chlorpyrifos to Glochidia of Freshwater Mussel *Hyriopsis bialata* Simpson, 1900. Master of Science (Biology), Major Field: Biology, Department of Zoology. Thesis Advisor: Associate Professor Uthaiwan Kovitvadhi, Ph.D. 83 pages.

The acute toxicity of a carbosulfan and chlorpyrifos to glochidia of the freshwater mussel (*Hyriopsis bialata* Simpson, 1900) was evaluated under static conditions in dechlorinated tap water. The median effective concentrations (EC_{50}) of carbosulfan at 24 and 48 h were greater than 0.10 mg/L. The no observed effect concentration (NOEC) was 0.10 mg/L at 48 h and the lowest observed effect concentration (LOEC) was greater than 0.10 mg/L at 48 h. The EC_{50} of chlorpyrifos at 24 and 48 h were 0.083 (0.079-0.087) and 0.078 (0.062-0.092) mg/L, respectively. The NOEC was 0.05 mg/L at 48 h while the LOEC was 0.07 mg/L at 48 h. The EC_{50} of a combined exposure to carbosulfan and chlorpyrifos (expressed as chlorpyrifos concentration) at 48 h was 0.15 mg/L. In a separate experiment the effect of water hardness on carbosulfan, chlorpyrifos, and a combined exposure to carbosulfan and chlorpyrifos were assessed using glochidia exposed to either standard reconstituted soft water, moderately-hard water, or hard water. There was no effect of the water hardness on the survival of glochidia at 24 and 48 h during carbosulfan toxicity test. The chlorpyrifos 48 h EC_{50}s in soft water, moderately-hard water, and hard water were 0.18 (0.17-0.19), 0.11 (0.10-0.12), and 0.16 (0.11-0.19) mg/L, respectively. The result indicates that the lowest water hardness resulted in the highest survival of glochidia, whereas an increase to moderate water hardness resulted in significantly decreased survival of glochidia (P<0.05). In addition, the EC_{50}s of a combined exposure to carbosulfan and chlorpyrifos at 48 h in soft water, moderately-hard water, and hard water were 0.13 (0.12-0.14), 0.14 (0.13-0.16), and 0.067 (0.060-0.086) mg/L, respectively. The result indicates that the combined toxicity was lowest at low and moderate water hardness, whereas an increase to hard water hardness resulted in a decreased survival of glochidia.

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