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PAPER

**Acute Toxicity and Sub-lethal Effects of Chlorpyrifos to Three Larvivorous Fish, *Poecilia reticulata*, *Aplocheilus dayi*, and *Rasbora daniconius***

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The insecticide belonging to the organophosphate group, chlorpyrifos 40 % EC, is reported to be highly toxic on fish and it is under restricted usage globally. This chemical is used by Dry Zone chena cultivators and hence, there is a possibility of contaminating the bordering water sources rich with larvivorous fish by tracer amounts of this chemical.

Two naturally occurring fish species, *Aplocheilus dayi* (nalahandaya) and *Rasbora daniconius* (dandiya) and introduced fish species, *Poecilia reticulata* (wild guppy) are among the potential larvivorous fish in Sri Lanka. The present study was carried out to find out; acute toxicity of chlorpyrifos 40% EC (commando™), to *Aplocheilus dayi*, *Rasbora daniconius* and *Poecilia reticulata*, effects of sub-lethal concentrations of chlorpyrifos on offspring production and on histological alterations in the gill structure. The exposure media contained a series of concentrations (50, 5, 0.5 and 0 µg/l) of chlorpyrifos 40 EC in glass aquaria.

Based on the mortality data, LC<sub>50</sub> (24 hr) value of chlorpyrifos 40 EC for *Aplocheilus dayi*, *Rasbora daniconius* and *Poecilia reticulata* was estimated as 0.514µg/l, 0.472 µg/l and 0.882µg/l respectively. It was also revealed that chlorpyrifos 0.5 µg/l of sub-lethal level to *P. reticulata* has induced production of hatchlings (mean number of 15 hatchings per female per day) whereas no production of hatchings was observed in other treatments during the exposure period. Histopathological study of the gills exposed to 5 and 50 µg/l of chlorpyrifos for 48 hr showed hypertrophy of gill arches, lifting and degeneration of lamella epithelium, degeneration of gill filaments and vasodilation in the lamella axis of both *Rasbora daniconius* and *Poecilia reticulata*.

This study concludes that LC<sub>50</sub> values vary for three fish species tested and *Poecilia reticulata* is more resistant than the other two species. The sub-lethal levels of contaminants of chlorpyrifos 40EC cause histological and physiological aberration in freshwater fish.

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