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## Research Paper

# Haemotoxic effect of sumithion on fresh water fish *Clarias batrachus*

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### Abstract

Exposure of fresh water fish, *Clarias batrachus* to 5.25 mg/L concentration of pesticide sumithion decreased the haemoglobin content, red blood cell count and haematocrit values by 25.30%, 8.90% and 14.93% within 24 hours.

**Keywords:** Sumithion, Toxicity, *Clarias batrachus*

### Introduction

The effects of pesticides on fresh water fishes in experimental laboratory conditions have been studied earlier<sup>1-6</sup>. The pesticides leach out in water areas and persist there in high quantities. Sumithion, an organophosphorus pesticide which is commonly used was selected for the experiment. Its effects on haemoglobin content (Hb), red blood cell (RBC) count and haematocrit (Hct) values in fresh water fish *Clarias batrachus*, after exposure to 5.25 mg/L of sumithion for 24 hours, are given in this paper.

### Materials and Methods

The fishes collected from the river Gomti, at Lucknow, were brought to laboratory in wide mouthed pots in natural water, washed three times in tap water and treated with 2% KMnO<sub>4</sub>, to remove external parasitic infections. Normal healthy fishes, selected for the experiment, were transferred to large glass aquaria and acclimatised for 96 hours. Water characteristics, temperature (°C), pH, alkalinity (mg/L) and hardness (mg/L) were analysed before dissolving the pesticide in water and after 24 hours by using standard methods<sup>1</sup>.

Fishes few minutes before the completion of 24 hours of pesticide treatment were taken out. Blood was collected from the live fish, by puncturing the caudal vein, in vials and thoroughly mixed with 1% ethylene diamino tetra acetic acid (EDTA). The data in respect of Hb content, RBC count and Hct were obtained by preparing dilutions and using Semi-Automatic Blood Cell Counter Boehringer Mannheim Diagnostics HC-555.

**Table 1: Water characteristics (Mean±S.D.)**

	Temp °C	pH	Alkalinity mg/L	Hardness mg/L	Dissolved Oxygen mg/L
Before dissolving the pesticide in water	20.0±1.3	7.2±0.3	115±3	120±4	7.0 ±0.4
After 24 hours of exposure	12.4±0.6	7.7±0.4	113±2	121±4	6.4±0.3

The pH of the medium increased after dissolving the pesticide in water while dissolved oxygen decreased (Table 1). Asphyxiation may be the cause of death, due to sumithion, of all the fishes just after 24 hours. Other water characteristics were almost unchanged.

Haemoglobin content, RBC count and haematocrit decreased 25.30%, 8.90% and 14.93%, respectively within 24 hours of pesticide treatment (Table-2). All the fishes become weak and anaemic and finally died.

**Table 2: Haematological parameters (Mean±S.D.)**

	Hb (gm%)	RBC Count (Million/cmm)	Hct (%)
<b>Control</b>	6.5 ± 0.9	3.2 ± 1.2	10.2 ± 1.4
<b>Treated</b>	4.9 ± 0.7	2.9 ± 0.8	8.6 ± 1.4

## Discussion

Significant changes in haematological and biochemical parameters of fresh water fishes were observed due to the effects of pesticides<sup>3,6</sup>. Organophosphorus pesticides are known to cause death due to asphyxiation<sup>2</sup>. In this study, after 24 hours, there was decrease in dissolved oxygen in water which may be one of the contributing factor for the death of fish. Haematological parameters, Hb content, RBC count and Hct decreased at the end of the experiment. Malathion treatment also decreased Hb and TEC of the fish, *Channa punctatus*. It is also indicated that sumithion has remarkable effect on the haemopoietic system of fishes and needs further investigation. The fishes were unable to adjust in the altered haemopoietic system of the body, and ultimately died<sup>7-16</sup>.

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