

## **Toxicity of triclosan, an antimicrobial agent, to a nontarget freshwater zooplankton species, *Moina macrocopa***

Thilomi Samarakoon (Department of Zoology and Environmental Management, Faculty of Science, University of Kelaniya, Kelaniya, Sri Lanka)

Takeshi Fujino (Department of Environmental Science and Technology, Graduate School of Science and Engineering, Saitama University, Saitama 3388570, Japan)

Journal – Environmental Toxicology

ISSN: 1522-7278

Article publication date: 13 September 2023

### **Abstract**

The toxicity of triclosan (TCS) on the freshwater cladoceran *Moina macrocopa* was investigated by acute and chronic toxicity assessments followed by genotoxicity and oxidative stress response analyses. The 48-h LC<sub>50</sub> of TCS for  $\leq 24$ -h-old *M. macrocopa* was determined as 539  $\mu\text{g L}^{-1}$ . Chronic exposure to TCS at concentrations ranging from 5 to 100  $\mu\text{g L}^{-1}$  showed a stimulatory effect at low concentrations ( $\leq 10 \mu\text{g L}^{-1}$ ) and an inhibitory effect at high concentrations ( $\geq 50 \mu\text{g L}^{-1}$ ) on growth, reproduction, and population-growth-related parameters of *M. macrocopa*. The genotoxicity test results indicated that TCS concentrations ranging from 50 to 100  $\mu\text{g L}^{-1}$  can alter individuals' DNA. Analysis of the antioxidant enzymes catalase (CAT) and glutathione s-transferase (GST) demonstrated increased levels of these enzymes at high TCS concentrations. Our results indicated that TCS concentrations found in the natural environment have minimal acute toxicity to *M. macrocopa*. However, TCS at even low concentrations can significantly affect its growth, reproduction, and population-growth-related characteristics. The observed responses suggest a hormetic dose–response pattern and imply a potential endocrine-disrupting effect of TCS. Our molecular and biochemical findings indicated that high concentrations of TCS have the potential to induce oxidative stress that may lead to DNA alterations in *M. macrocopa*.

### **Citation**

Hemant Pandit Borase, Rekha S. Singhal, Satish Vitthal Patil, Copper oxide nanoparticles exhibit variable response against enzymatic toxicity biomarkers of *Moina macrocopa*, Environmental Science and Pollution Research, 10.1007/s11356-023-30145-z, (2023)

### **Publisher**

Wiley