

ACUTE TOXICITY OF HYDROCORTISONE ACETATE TO *DAPHNIA MAGNA*

A. L. Zelenyj
zelenuj82@gmail.com

The Department of Hygiene and Trophylactic Toxicology,
Danylo Halytsky Lviv National Medical University, Lviv, Ukraine

Hydrocortisone Acetate (CAS 50-03-30) is used in medical practice in pure form and in the form of esters (acetate, butyrate, hemisuccinat etc.) intravenously and intramuscularly (in doses of 50–1500 mg) and locally (at the joint cavity, externally as 0.5–2.5 % ointment or cream on the skin and mucous membranes of the eye). The purpose of this work was to investigate the acute citotoxicity of hydrocortisone whom allowable contents (maximum permissible concentrations) in environment are not determined in Ukraine. Testing in conditions *in vitro* is included in the list of required methods for assessing the potential hazards of chemicals on human health and the environment.

Acute toxicity tests were conducted exposing 24-hour-old *Daphnia magna* Straus (180 daphnids) to six concentrations of hydrocortisone acetate: 0,012; 0,025; 0,05; 0,1; 0,25; 0,5 mg/L. The tests were performed at a temperature of 19–21 °C, the pH of water was 7,2–7,3.

The frequency of mortality were recorded after 1, 6, 24, 48, 72 and 96 hours of exposure and were used to calculate medium lethal concentration LC_{50} . The metod of estimating the LC_{50} included the two-parameter probit metod.

The mortality of *Daphnia magna* during 1–6 hours were absent regardless of hydrocortisone concentrations. The 24 h mortality were 10–63 % and frequency increased with increasing input concentration ($r=0,86$; $P<0,01$). The mortality determined at 48 h were 83 % at the 0,012 mg/L and 100 % at all other concentrations. 100 % of dead daphnids were determined at 72 and 96 h of medicine exposure. The 24 h LC_{50} values is 0.275 mg/L. Control cultures were viable during the experiment.

Hydrocortisone toxicity to *Daphnia magna* Straus, obviously, caused such its contraindications as body fluid retention, increasing the tissue alkalinity and metabolic disorder for potassium and sodium.

To research acute toxicity of hydrocortisone to *Daphnia magna* Straus and calculate 24 h LC_{50} (0,275 mg/L). The results suggest that hydrocortisone introducing in natural waters at concentrations more than 0,012 mg/L is harmful to aquatic biota.