

003728

EFFECTS OF WATER TEMPERATURES ON THE ACUTE
TOXICITY OF LEAD TO GIANT FRESHWATER PRAWNS,

MACROBRACHIUM ROSENBERGII DE MAN

by

CHERID KALAYANAMITR

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE
(ENVIRONMENTAL BIOLOGY)



in the

FACULTY OF GRADUATE STUDIES

of

MAHIDOL UNIVERSITY

1983

อธิบดีมหาวิทยาลัย

จาก

มหาวิทยาลัยมหิดล

ABSTRACT

Effects of water temperatures on the acute toxicity of lead to gaint freshwater prawns, Macrobrachium rosenbergii de Man, were investigated using bioassay studies under laboratory conditions. The 24-, 48-, 72-, and 96-hr. LC_{50} values of the prawns (acclimatized at 22°C) tested at temperatures of 22° and 32°C were 275.1, 272.1, 256.2 and 245.0 mg/1 Pb, and 191.1, 151.2, 123.5 and 105.2 mg/1 Pb, respectively. The 24-, 48-, 72-, and 96-hr. LC_{50} values of the prawns (acclimatized at 27°C) tested at temperatures of 22°, 27°, and 32°C were 236.0, 220.6, 214.5 and 208.6 mg/1 Pb; 290.8, 259.5, 243.7 and 233.4 mg/1 Pb; and 270.3, 234.2, 211.0 and 198.7 mg/1 Pb, respectively. The 24-, 48-, 72-, and 96-hr. LC_{50} values of the prawns (acclimatized at 32°C) tested at temperature of 32° and 22°C were 314.1, 297.1, 279.1 and 261.3 mg/1 Pb, and 235.1, 203.0, 179.8 and 152.3 mg/1 Pb, respectively.

The effects of water temperatures on the acute toxicity of lead to the prawns were highest at 10°C - temperature change, followed by 5°C - temperature change and unchanged temperature.

The prawns were exposed in 23.34 mg/1 Pb, which is 10% of the 96-hr. LC_{50} values observed from previous treatment at the test temperature of 27°C, for 6 weeks. Lead accumulations from weeks 1 to 6 were 0, 14.3, 20.4, 22.8, 29.5 and 33.1 µg/g wet weight, respectively. The lead level in the prawns increased as the exposure time increased, and decreased to undetectable level within a week after they were transferred to clean water. Lead level in the control group was nil for 8 weeks.