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The Determination of Thiourea and Nickel Cloride LC_{50} Concentration on the Species of Acanthodiaptomus Denticornis and *Cyclops vicinus* (Copepoda)

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Abstract: In this study search for LC_{50} concentration thiourea and nickel chloride (cancerogen) on *Acanthodiaptomus denticornis* and *Cyclops vicius* (Copepoda) have been investigated. A solution in different concentration has been put into an environment of, 15 cc containing 10 individual and by observing for 24 h, the death rate has been investigated and by using the control group, 15 sperate test have been made for each different test and by having the varage number of them, the death rate in each concentration has been calculated. As a result the LC_{50} concentration has been determined.

Key words: Thiourea and nickel cloride, concentration, *Cyclops vicinus*

Introduction

Metal concentrations may be elevated in the aquatic environment due to human activity. Natural populations in polluted areas are thus subjected to selective pressures to develop increased resistance to these metals (Klerks and Levinton, 1993a; Bachiorri *et al*., 1991; Klerks and Levinton, 1993b). The ultimate aim of ecotoxicological studies is to predict how natural populations respond to contaminant exposure. In this context it is often assumed that laboratory and field organisms will respond identically towards a certain contaminant. Chapman (1983) identified acclimation and adaptation as factors that may produce differences in tolerance in laboratory tests are conducted with non-acclimated organisms.

Now-a-days, canserogen substances are quite important for human health and increased day by day. These substances can be taken either directly or through food.

Studies about effect on aquatic organisms species of some metals have been by Barata *et al*. (2002), Blackmore and Wang (2002), Vigano (2000), Bagarinao (1992), Münzinger and Monicelli (1992).

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The canserogen substances in food are becoming to be quite dangerous risk factor for human life. The high solubility of Thiourea and Nickel chloride in cold water makes important aspect for us to study *Acanthodiaptomus denticornis* and *Cyclops vicinus* species which are important foods for fishes.

Materials and Methods

Adults of *Acanthodiaptomus denticornis* and *Cyclops vicinus* were used in experiments. Concentration by degrees raised. Experiment medium that ten placed 15 cc substance. Every concentration were agained, 15 time. For every concentration were used group control non canserogen substances also.

Complete of experiments were did in rom hot and adult Copepoda growed in laboratory and collect from Hazar Lake. For every concentration established average death measure after 24 h. LC_{50} estimate did with regression analysis.

Death number and Thiourea concentrations used for *Acanthodiaptomus denticornis* species given, in below.

Concentration (x)	Used individual number (n)	Death number
0.0012	150	35
0.0014	150	42
0.0017	150	60
0.0018	150	71
0.0020	150	79
0.0030	150	90
0.0050	150	115

Results

Concentration for *Acanthodiaptomus denticornis* species began 0,0012 thiourea and 0,00003 Nickel chloride (Table 1-4).

Table 1: Regression straight of Thiourea to *Acanthodiaptomus denticornis* species

Lograthmic concentration x	Examined individual number n	Death rate p	Estimated probit y	Working probit y	Weight w
1.079	150	23.33	4.5	4.3	87.1
1.146	150	28	4.6	4.4	90.0
1.230	150	40	4.7	4.7	92.4
1.255	150	47.33	4.7	4.9	92.4
1.301	150	52.66	4.8	4.9	94.1
1.477	150	60	5.2	5.2	94.1
1.699	150	76.66	5.8	5.7	75.4

x	y	w	wx	wx^2	wy	wxy
1.079	4.3	87.1	94	101.4	374.5	404.1
1.146	4.4	90.0	103.1	118.2	396	453.8
1.230	4.7	92.4	113.7	139.8	434.3	534.2
1.255	4.9	92.4	116	145.5	452.8	568.3
1.301	4.9	94.1	122.4	159.3	461.1	599.9
1.477	5.2	94.1	139	205.3	489.3	722.7
1.699	5.7	75.4	128.1	217.6	429.8	730.2
		∑625.5	∑816.3	∑1087.1	∑3037.8	∑4013.2

$$b = \frac{\sum W \sum wxy - \sum wx \sum wy}{\sum W \sum wx^2 - (\sum wx)^2} \qquad b=2.2$$

$$a = \frac{\sum Xy}{\sum w} - \frac{b \sum w}{\sum w} \qquad a = 2$$

$$LC_{50} = \text{antilog}\ \frac{(7\text{-}a)}{6.10000} = \text{antilog}\ \frac{(7\text{-}2)}{2,2.10000}$$

$$LC_{50} = 0.000100052$$

Death number and Nickel chloride concentrations used for *Acanthodiaptomus denticornis* species given, in below

Concentration (x)	Used individual number (n)	death number
0.00003	150	38
0.00005	150	45
0.00008	150	62
0.00010	150	80
0.00020	150	94
0.00040	150	112

Table 2: Regression straight of Nickel clorür to *Acanthodiaptomus denticornis* species

Lograthmic concentration x	Examined individual number n	Death rate p	Estimated probit y	Working probit y	Weight w
0.477	150	25.33	4.6	4.4	90
0.699	150	30	4.6	4.5	90
0.903	150	41.33	4.7	4.8	92.4
1	150	53.33	4.8	5	94.1
1.3	150	62.66	5.1	5.3	95.1
1.6	150	74.66	5.8	5.7	79.39

x	y	w	wx	wx^2	wy	wxy
0.477	4.4	90	42.9	20.5	396	188.9
0.699	4.5	90	62.9	44	405	283
0.903	4.8	92.4	83.4	75.3	443.5	400.5
1	5	94.1	94.1	94.1	470.5	470.5
1.3	5.3	95.1	123.6	160.7	540.0	659.2
1.6	5.7	75.39	120.6	193	429.7	687.6
		∑536.99	∑527.5	∑587.6	∑2648.7	∑2685.7

b=1.2 a=3.7

$$LC_{50} = \frac{(6\text{-}3.7)}{1,2.100000} = 1,000044134$$

$$LC_{50} = 0,00001$$

Death number and Nickel chloride concentrations used for *Cyclops vicinus* species given, in below

Concentration (x)	Used individual number (n)	death number
0.0013	150	47
0.0015	150	56
0.0017	150	67
0.0018	150	73
0.0020	150	80
0.0030	150	98

Table 3: Regression straight of Thiourea to *Cyclops vicinus* species

Lograthmic concentration x	Examined individual number n	Death rate p	Estimated probit y	Working probit y	Weight w
1.11	150	31.33	4.62	4.5	90.0
1.18	150	37.33	4.72	4.7	92.4
1.23	150	44.66	4.82	4.9	94.1
1.25	150	48.66	4.87	5.0	95.1
1.30	150	53.33	4.97	5.0	95.5
1.48	150	65.33	5.46	5.4	90.078

x	y	w	wx	wx^2	wy	wxy
1.11	4.5	90	99.9	110.9	405	499.5
1.18	4.7	92.4	109	128.7	434.3	512.5
1.23	4.9	94.1	115.7	142.4	461	567
1.25	5	95.1	118.9	148.6	479.5	594.4
1.30	5	95.5	124.2	161.4	477.5	620.7
1.48	5.4	87.1	128.9	190.8	470.3	696.1
		∑554.2	∑696.6	∑882.8	∑2723.6	∑3440.2

b = 2.7 a = 1.5

$$LC_{50} = \text{antilog}\ \frac{(6\text{-}1.5)}{2,7.10000} = 1,0003836$$

$$LC_{50} = 0,0000100038$$

Death number and Nickel chloride concentrations used for *Cyclops vicinus* species given in below

Concentration (x)	Used individual number (n)	death number
0.0004	150	40
0.0006	150	50
0.0008	150	63
0.0009	150	78
0.0010	150	89
0.0020	150	101

Table 4: Regression straight of Nickel clorür to *Cyclops vicinus* species

Lograthmic concentration x	Examined individual number n	Death rate p	Estimated probit y	Working probit y	Weight w
0.602	150	26.66	4.5	4.3	87.15
0.778	150	33.33	4.7	4.5	92.41
0.903	150	42	4.8	4.8	94.11
0.954	150	52	4.9	5	95.15
1	150	59.33	4.9	5.2	95.15
1.301	150	67.33	5.6	5.4	83.68

Table 4: Continuous

x	y	w	wx	wx^2	wy	wxy
0.602	4.3	87.15	52.46	31.58	374.75	225.60
0.778	4.5	92.41	71.89	55.93	415.85	323.53
0.903	4.8	94.11	84.98	76.74	451.73	407.91
0.954	5.0	95.15	90.77	86.60	475.75	453.86
1	5.2	95.15	95.15	95.15	494.78	494.78
1.301	5.4	83.68	108.87	141.64	451.87	587.88
		∑547.65	∑504.12	∑487.64	∑2664.73	∑2493.56
b= 1.72			a= 3.29			

$$LC_{50} = \text{antilog} \frac{(6-3.29)}{1,72.100000}$$

LC_{50} = 0,0000100003628

According to death rates, concentration increased periodical. LC_{50} concentration for *Acanthodiaptomus denticornis* established 0,01862 thiourea and 0,000825 Nickel chloride. Concentration for *Cyclops vicinus* species began 0,0013 thiourea and 0,00004 Nickel chloride. According to death rates, concentration increased periodical. LC_{50} concentration for Cyclops vicinus established 0,00646 thiourea and 0,000363 Nickel chloride.

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