

Cyanazine (CAS no. 21725-46-2)

Tier 1 *in vivo* Test

(1) Results

Fish were exposed to concentrations of 0.110, 0.349 and 1.02 mg/L (measured). No significant differences were observed in fertility rate, male and female total length, body weight, hepatic vitellogenin, secondary sex characteristics and male gonadosomatic index.

A significant decrease was observed in male and female hepatosomatic indexes at 0.349 mg/L and higher.

At 1.02 mg/L, reduced feeding behavior, lack of coordination, floating near the surface and bleeding were observed in male and female, and a significant decrease was observed in number of eggs, number of fertile eggs and female gonadosomatic index.

(2) Summary

The significant decrease observed in number of eggs and number of fertile eggs at 1.02 mg/L were considered adverse reproductive effects on Medaka.

While antiestrogenic activity of cyanazine has been indicated from literature, a decrease in female hepatic vitellogenin level was not observed at sublethal concentrations to suggest antiestrogenic effect in this study. It was not concluded that cyanazine is an antiestrogenic compound.

The adverse exposure level of 1.02 mg/L was ca. 408,000 times as high as the highest environmental water concentration of 2.5 ng/L that was measured in MOE's Environmental Survey and Monitoring of Chemicals in FY2006.

Table 1-A Results

Measured concentration (mg/L)	Number of fish		Mortality (%)		Total length (mm)		Body weight (mg)	
	male	female	male	female	male	female	male	female
Control	12	12	0	0	35.4±0.61	36.4±0.46	476±8.9	592±18
0.110	12	12	0	0	34.6±0.42	35.8±0.30	437±31	546±15
0.349	12	11	0	8.3	35.3±1.1	35.8±0.95	483±50	515±28
1.02	11	11	8.3	8.3	34.4±0.76	35.0±1.0	419±40	470±49

Table 1-B Results (continued)

Measured concentration (mg/L)	Number of eggs (eggs/female/day)	Number of fertile eggs (eggs/female/day)	Fertility rate (%)	Gonadosomatic Index (%)	
				male	female
Control	20.1±4.9	18.1±4.2	90.4±3.3	0.71±0.085	10±1.7
0.110	13.6±3.3	11.6±3.6	84.6±6.6	0.67±0.038	10±1.6
0.349	14.0±5.1	11.5±5.8	79.8±19	0.67±0.11	8.3±0.93
1.02	7.8±5.1*	6.3±5.5*	71.1±20	0.55±0.080	7.6±0.88*

Table 1-C Results (continued)

Measured concentration (mg/L)	Hepatosomatic Index (%)		Vitellogenin (ng/mg liver)		Secondary sex characteristics	
	male	female	male	female	male	female
Control	2.3±0.34	4.8±0.72	1.9±2.8	2,360±617	98±9.9	0
0.110	2.2±0.34	4.2±0.30	nd	2,570±528	99±9.1	0
0.349	1.8±0.18*	3.4±0.69*	nd	2,550±896	96±5.9	0
1.02	1.7±0.14*	3.5±0.33*	nd	2,860±679	94±23	0

Table 1-D Results (continued)

Measured concentration (mg/L)	Other observations
Control	Not found
0.110	Not found
0.349	Not found
1.02	Reduced feeding behavior, lack of coordination, floating near the surface, bleeding, etc.

Data show mean ± SD (standard deviation)

Statistically significant differences from control group (**p<0.01, *p<0.05)

nd: not detected (below detection limit of vitellogenin: 1ng/mg liver)

(-): not measured

Secondary sex characteristics: number of papillary processes