

Diazinon (CAS no. 333-41-5)

Tier 1 *in vivo* Test

(1) Results

Fish were exposed to concentrations of 38, 196, 598 and 952 µg/L (measured). No significant differences were observed in secondary sex characteristics and male and female hepatic vitellogenin level.

A significant decrease were observed in male and female total length, body weight, gonadosomatic index, hepatosomatic index, number of eggs, number of fertile eggs and fertility rate at 196 µg/L and higher. Motor paralysis of all fish was observed at 196 µg/L and higher.

A significant increase was observed in male and female mortality at 598 µg/L and higher.

(2) Summary

The significant decrease observed in number of eggs, number of fertile eggs and fertility rate at 196 µg/L and higher were considered adverse reproductive effects on Medaka.

While estrogenic activity of diazinon has been indicated from literature, an increase in male hepatic vitellogenin level was not observed at sublethal concentrations to suggest estrogenic effect in this study. It was not concluded that diazinon is an estrogenic compound.

The adverse exposure level of 196 µg/L was ca. 10,300 times as high as the highest environmental water concentration of 0.019 µg/L that was measured in MOE's Environmental Survey and Monitoring of Chemicals in FY2006.

The non-adverse exposure level of 38 µg/L was ca. 20,000 times as high as the highest environmental water concentration of 0.019 µg/L that was measured in MOE's Environmental Survey and Monitoring of Chemicals in FY2006.

Table 1-A Results

Measured concentration (µg/L)	Number of fish		Mortality (%)		Total length (mm)		Body weight (mg)	
	male	female	male	female	male	female	male	female
Control	10	13	9.1	0	30.7±0.4	31.7±1.7	300±46	375±57
38	12	11	0	8.3	30.0±1.1	30.6±1.2	294±36	333±42
196	11	8	8.3	33.3	28.5±0.8**	28.2±1.0**	199±20**	213±18**
598	6	4	50.0*	66.7*	29.5±0.7*	28.7±0.9**	191±14**	203±48**
952	5	5	58.3*	58.3*	28.1±1.2**	27.5±1.2**	179±19**	201±30**

Table 1-B Results (continued)

Measured concentration (µg/L)	Number of eggs (eggs/female/day)	Number of fertile eggs (eggs/female/day)	Fertility rate (%)	Gonadosomatic Index (%)	
				male	female
Control	19.7±5.9	19.3±5.7	97.9±0.7	1.2±0.2	12.9±2.1
38	18.8±4.4	18.1±4.3	96.3±0.9	0.9±0.4	12.3±1.3
196	1.1±2.4**	0.1±0.6**	11.6±6.2**	0.6±0.2*	6.8±3.5**
598	0.4±1.2**	0.2±1.1**	55.3±6.7**	0.4±0.1**	3.3±0.7**
952	0.2±1.1**	0.0±0.2**	8.8±14.3**	0.5±0.1*	6.9±2.4**

Table 1-C Results (continued)

Measured concentration (µg/L)	Hepatosomatic Index (%)		Vitellogenin (ng/mg liver)		Secondary sex characteristics	
	male	female	male	female	male	female
Control	3.6±1.0	5.8±1.5	nd	984±374	80.5±13.6	0.0±0.0
38	2.8±1.7	5.3±1.2	nd	2,670±1,940	81.8±15.8	0.0±0.0
196	1.6±0.6**	2.0±0.7**	nd	1,720±1,390	83.7±19.3	0.0±0.0
598	1.2±0.4**	2.0±0.3**	nd	577±482	89.0±16.9	0.0±0.0
952	1.5±0.6**	1.6±0.5**	nd	1,960±1,250	88.6±15.3	0.0±0.0

Table 1-D Results (continued)

Measured concentration (µg/L)	Other observations
Control	Not found
38	Motor paralysis of 12.5% fish
196	Motor paralysis of all fish
598	Motor paralysis of all fish
952	Motor paralysis of all fish

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 joint plates with papillary processes