Sulfamethoxazole (CAS no. 723-46-6)

Tier 1 *in vivo* Test

(1) Results

Fish were exposed to concentrations of 0.987, 3.38 and 10.2 mg/L (measured). No significant differences were observed in mortality, gonadosomatic index, male hepatosomatic index, secondary sex characteristics and female hepatic vitellogenin level.

At 3.38 mg/L and higher, a significant decrease in total number of eggs and number of fertile eggs was observed.

At 10.2 mg/L, a significant increase in male hepatic vitellogenin level and fertility index was observed, and a significant decrease in female hepatosomatic index was observed

(2) Summary

Estrogenic activity of sulfamethoxazole has been indicated from literature. In this study, an increase in male hepatic vitellogenin level was observed at sublethal concentrations to suggest estrogenic effect. But this increase was as small as about twice the lower limit of quantification, thus inconclusive.

The adverse exposure level of 3.38 mg/L was ca. 17,800 times as high as the highest environmental water concentration of 0.19 μg/L that was measured in MOE's Environmental Survey and Monitoring of Chemicals in FY2014.

The no observed adverse effect level of 0.987 mg/L was ca. 5,200 times as high as the detection limit of environmental water concentration of 0.19 μg/L for MOE's Environmental Survey and Monitoring of Chemicals in FY2014.

Table 1-A Results

Measured concentration (mg/L)	Number of tested fish		Total length (mm)		Body weight (mg)		Total length (mm)	
	male	female	male	female	male	female	male	female
Control	12	12	0	0	35.0±0.6	35.1±0.6	435±27	504±17
0.987	12	12	0	0	35.3±1.2	36.0±0.2	468±57	514±5.3
3.38	12	12	8.3	0	34.8±0.8	35.9±0.7	435±4.6	541±15
10.2	12	12	8.3	0	36.5±1.1	36.1±0.5	511±55	536±27

Statistical analysis was not carried for total length and body weight.

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	24.8±1.3	24.7±1.3	99.6±0.4	0.86±0.088	9.5±1.2
0.987	20.9±2.4	20.2±2.5	96.6±1.9	0.84±0.10	9.2±0.65
3.38	19.0±0.7 *	18.1±0.7 *	95.4±2.9	0.82±0.071	9.2±1.3
10.2	18.0±2.2 *	16.2±3.8 *	89.0±12 *	0.82±0.083	9.8±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	2.1±0.14	5.4±0.24	nd	1,100±248	131±8.5	0±0
0.987	2.0±0.15	4.5±0.52	1.3±0.9	1,380±261	132±9.8	0±0
3.38	2.1±0.40	4.6±0.48	1.7±1.0	1,570±325	130±13	0±0
10.2	2.0±0.33	4.4±0.57 *	2.1±1.9 *	1,460±461	125±10	0±0

Table 1-D Results (continued)

Measured concentration (mg/L)	Other observations
Control	Not found
0.987	Not found
3.38	Not found
10.2	Not found

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