Abstract

Environmental contamination becomes a major problem worldwide due to ubiquitous chemicals from agricultural, industrial, and household discharge as well as natural products. Using many animal models and various techniques, researchers have revealed several mechanisms of actions that have been postulated to impair normal physiological function, however, is discrepancy between laboratory and field study is still exist. This study was designed to investigate if there are any indicators implying that reproductive potential of fish collected from the so-called “Bung Kaen Na Korn” (KNK) which used to be collecting area for waste water and it is still vulnerable to be exposed to household discharge. In addition, KNK has a history of high mortality of fish in the reservoirs a few times. Bung Kang Num Ton (KNT) was used to be a controlled site since situate in a much less dense community without any evidence of high mortality. Nile tilapia (*Oreochromis niloticus*) and Silver barb (*Puntius gonionotus*) were chosen as animal model. Plasma steroids, eg. testosterone, 11keto-testosterone and 17β-estradiol, triiodotyronine and tetraiodotyronine were measured. Gonadosomatic index (GSI) and Liversomatic index (LSI) were also recorded as well as morphological and histological of the liver. Selected heavy metals were also analyzed. Testosterone and 17β-estradiol concentrations were highly varied while 11keto-testosterone concentration in the male of tilapia was consistently higher than silver barb. There were no differences of T3 and T4 concentration as well as for GSI and LSI indices. Selected heavy metals include Pb, Cd, Zn, Ni, and Cu bioconcentrations in a pooled liver and gonad were similar between two reservoirs, 0.006-0.011 mg/g dry weight of Pb, and 0.002-0.003, 0.074-0.085, 0.011-0.013 and 0.005-0.044 mg/g dry weight, respectively. In addition, there was no evidence of pesticides bioaccumulation except for 4,4 DDD which found in pooled liver tissue in very small amount, but it was not detected in pooled water sample and pooled sediment sample collected from both lakes.

Evidence of blood congestion found only in tilapia liver coincide with histological evidence revealed sign of cell death, vacuole and disappearance of hepatic lobule and hepatic cell shrinkage was not correlated with selected environmental parameters in this study.

In summary, there is no clear evidence suggesting an impaired reproductive performance based on our primary results. Evidence of selected heavy metal bioconcentration suggesting a vulnerability of consumer for metal toxicity. Even though those heavy metal concentration is not too high, a possibility of biomagnification is still exist. These pose interesting scenario for further investigation. Furthermore, cause of observed blood congestion and abnormal cell morphology remain to be identified.