Determination of the Potential Eco-toxicological Effects in Wang-Nian River by \textit{in Vitro} Bioassay Methods

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The eco-toxicities including estrogenic activity and oxidative liver injury of sewage from Wang-Nian River, Pingtung County, Taiwan, ROC were investigated in this study. \textit{In vitro} bioassays for endocrine disruptors (EDs) and oxidative liver injury were carried out using human breast cancer cell line, MCF-7 and MVLN, and human hepatoma cell line, HepG2. There were 36 samples collected 18 sites in February, 2001. After treatment through solid-phase extraction (SPE) with Sep-Pak RP-18 cartridges, the samples were subjected to in-vitro bioassay measurement. 17β-estradiol (10^{-9} \text{ M}) and cumene hydroperoxide (2.5mM) were used as positive for estrogenicity and oxidative liver toxicity assays, respectively, while the negative control was DMSO (05\%). The results were expressed as relative efficiency (RE \%) to positive control.

The relative estrogenic efficiency of sewage samples was classified into three grades: \textgreater 100, within 50-100, and \textless 50. Their occurrence ratio was 11 \%, 61\%, 28\%, respectively. In addition, MVLN cells possess higher tolerance toward the toxicity of environmental samples than that of MCF-7 cells. Upon oxidative liver toxicity, all samples (five-fold condensed) were found TBARs positive effects ranged from 37.4 to 264\%, and about 33\% of the samples exceeding 100\%. There was only 33\% of samples were found LDH positive ranged from 18 to 42\%. In this preliminary results indicate that reactive oxygen substances (ROS) and non-ROS cytotoxic substances were present in sewage samples of Wang-Nian River.