

Determination of the Potential Eco-toxicological Effects in Wang-Nian River by *in Vitro* Bioassay Methods

Meei-Fang Shue^{1*}, Fu-An Chen¹, Chi-Ying Hsieh¹, Hideo Utsumi², Chau-Yang Chen¹

¹Tajen Institute of Technology, Taiwan, R.O.C.

²Faculty of Pharmaceutical Sciences, Kyushu University, Japan

E-mail: mfshue@ccsun.tajen.edu.tw

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. *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. 17 β -estradiol (10^{-9} M) and cumene hydroperoxide (2.5mM) were used as positive for estrogenicity and oxidative liver toxicity assays, respectively, while the negative control was DMSO (0.5%). The results were expressed as relative efficiency (RE %) to positive control.

The relative estrogenic efficiency of sewage samples was classified into three grades: >100, within 50-100, and <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.