

## Bioassay of Estrogenic Activity of Effluent and Influent in a Farm Wastewater Treatment Plant Using an *in vitro* Recombinant Assay with Yeast Cells<sup>1</sup>

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**Objective** Environmental estrogens at an elevated concentration are known to produce adverse effects on human and animal life. However, the majority of researches have been focused on industrial discharges, while the impact of livestock wastes as a source of endocrine disruptors in aquatic environments has been rarely elucidated. In order to investigate the contribution of environmental estrogens from livestock, the estrogenic activity in water samples from a farm wastewater treatment plant was analyzed by a recombinant yeast screening method. **Methods** The extracts prepared from 15 selected water samples from the farm wastewater treatment plant, among which 6 samples were from pre-treatment section (influent) and 9 from post-treatment section (effluent), were analyzed for estrogenic activity by cellular bioassay. Yeast cells transfected with the expression plasmid of human estrogen receptor and the Lac Z reporter plasmid encoding  $\beta$ -galactosidase, were used to measure the estrogen-like compounds in the farm wastewater treatment plant. **Results** The wastewater samples from influents showed a higher estrogenic potency than the effluent samples showing a low induction of  $\beta$ -galactosidase relative to solvent control condition. By comparison with a standard curve for 17 $\beta$ -estradiol (E2), estrogenic potency in water samples from the influents was calculated as E2-equivalent and ranged from 0.1 to 150 pM E2-equivalent. The estrogenic potency in water samples from the effluents was significantly lower than that in the influents, and 7 water samples had less detectable limit in the total of 9 samples. **Conclusion** Yeast bioassay of estrogenic activity in most of the samples from the farm wastewater after disposal by traditional sewage treatment showed negative results.

**Key words:** Farm wastewater; Bioassay; Recombinant gene yeast; Environmental estrogens

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