9th ICEEE – 2018 International Conference on
"Climatic Change and Environmental (Bio) Engineering"
22nd - 24th of November, 2018
Budapest, Hungary

ESTROGENIC ACTIVITY IN AQUATIC ENVIRONMENTAL SAMPLES ASSESSED BY IN VITRO ASSAYS

Boglárka JOÓ[1], Judit PLUTZER[2], Hosam E.A.F. BAYOUMI HAMUDA[1]

[1]Óbuda University, Budapest, Hungary
[2]National Public Health and Medical Office Service, Budapest, Hungary

The aquatic environment is particularly sensitive to the impacts of pollutants. Effluents from municipal and industrial wastewater treatment plants, and agricultural run-off and drainage add numerous exogenous compounds to the aquatic ecosystem. (Xeno)estrogens are believed to reach the aquatic environment mainly by means of municipal and industrial sewage outfalls. However, agricultural drainage may also be a route for (xeno)estrogens to enter the aquatic system. Numerous natural and anthropogenic substances are known to exhibit estrogenic activity. Estrogenic activity in the aquatic environment has primarily been ascribed to the natural steroids, 17β-estradiol (E2), estrone (E1) and estriol (E3), and the synthetic estrogen, 17α-ethinylestradiol (EE2), used in contraceptives and all being excreted by women and ending up in domestic sewage. To a lesser extent xenoestrogenic chemicals, such as alkylphenols and bisphenol A, may also contribute to the estrogenic activity in the aquatic environment. This has led to efforts of finding simple, sensitive and specific *in vitro* tests for rapid screening of samples from wastewater and surface waters for their estrogenic activity. Already existing in vitro assays (e.g., Yeast-based reporter gene assay: *Yeast estrogen screen* (YES)) for screening of the estrogenic activity of single compounds have therefore been applied to environmental samples. However, yeast has a number of advantages over other systems including the absence of endogenous steroid hormone receptors and consequent lack of complex interactions between the estrogen receptor (ER) and other receptors. This study gives an evaluation of the existing *in vitro* techniques for determination of estrogenic activity in various environmental samples. The existing knowledge on the potentials and limitations of these techniques will be presented with the aim of finding the optimal methods for monitoring the estrogens in the environment of wastewater and surface water.

Keywords: *Estrogenic activity, aquatic environment, in vitro assays, estrogen receptor, Yeast estrogen screen*

Corresponding address:
Miss Name: Boglárka JOÓ
Institute of Environmental Engineering
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
H-1034 Doberdó Út 6.
Budapest, Hungary
Telephone: +36 1 666-5941,
Fax: +36 1 6665909
E-mail: boglarkajoo00@gmail.com