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INCIDENCE OF SELECTED ENDOCRINE DISRUPTING ESTROGENS IN WATER BODIES OF HYDERABAD AND ITS RELATION TO WATER QUALITY PARAMETERS

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Abstract

Environmental persistence of endocrine disrupting estrogen chemicals (EDC) subsequent to endocrine function even at nanogram concentration in environmental matrices has garnered significant global attention due to their possible disruptive effects in an intact organism, or its progeny. An attempt was made in present study to investigate the occurrence of two estrogens viz. natural (estriol, E3) and synthetic (17 α -ethynylestradiol, EE2) in the surface water bodies of Hyderabad, India. All the studied water bodies documented the presence of both the estrogens at alarming concentrations (E3, 104-370 ng/L; EE2, 98-350 ng/L). Among the six water bodies, highest level of synthetic estrogen was found in Pedda Cheruvu, while, relatively higher concentrations of natural estrogen was observed in Alwal Tank. The presence of estrogens in water bodies might be attributed to environmental changes, socio-economic development, wide spread use of birth control pills, direct release of agricultural and farm waste, surface runoff, industrial and agricultural activities etc. Compared to natural estrogen, synthetic estrogen was observed at higher concentrations in water bodies which receive domestic sewage, mostly from middle income groups. Natural estrogen was found at higher concentrations in the water bodies which receive water from agricultural activities. Multiple linear regression analysis (2-tailed significance; 99% confidence) was employed to predict the concentration of estrogens based on the physico-chemical parameters of the water bodies. Surface plots were used to evaluate the functional role of estrogens and water quality parameters. To the best of our knowledge, this report is the first study on the monitoring of estrogens in Indian water bodies.

Key words: 17 α -ethynylestradiol (EE2); direct competitive enzymatic-immunoassay, estriol (E3), estrogens, physico-chemical parameter

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