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Determining 17,-Estradiol Levels in Natural Water Sources

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Poster Presentation P45

DETERMINING 17,-ESTRADIOL LEVELS IN NATURAL WATER SOURCES

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Endocrine disrupting chemicals (EDCs) have become an increasing concern. These chemicals may mimic hormones and can disrupt the normal functioning of the endocrine system. If they are present in wastewater, they are often not removed by wastewater treatment processes. Therefore, as wastewater treatment effluent is released to the environment, these compounds may cause adverse affects in wildlife, such as a change of gender in various aquatic species or an increase in sterility. Because they are also seldom removed in drinking water purification, humans may also be affected through exposure to these compounds in drinking water from surface water sources. Previous studies show levels of EDCs in several water sources in the microgram per liter range. It is not yet known what levels of EDCs will pose a threat to the ecosystem or what levels should be considered safe for human consumption. However, studies indicate that even these low levels of EDCs can be detrimental. Of particular concern are synthetic estrogens originating from pharmaceutical sources, for instance, the oral contraceptive. Two compounds have been analyzed: 17 β -estradiol and 17 α -estradiol. To test for these compounds, water samples were collected from two locations on Sugar Creek, filtered, concentrated through solid-phase extraction, derivatized into their trimethylsilyl ethers, and analyzed by gas chromatography and mass spectrometry with electron impact ionization and selected ion monitoring. Our results show that 17 -estradiol is present in these samples at the nanogram per liter level.