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The Uptake of Endocrine Disrupting Chemicals

The excess birth control hormones that are being introduced into the environment around the world may be poisoning organisms of all types and sizes. This project was designed to test if the endocrine-disrupting chemicals being discharged into aquatic environments are being introduced into the terrestrial ecosystem. An experiment was designed to determine if Wisconsin Fast-Grow Plants would uptake 17β -estradiol from contaminated water. The chemical was successively diluted which produced four different solutions ranging in concentration from 3×10^{-3} g/L to 3×10^{-9} g/L. The plants were then grown using the water concentrated with 17β -estradiol. After growing for thirty-four days several physical characteristics were recorded including germination time, biomass, and amount of fully matured plants. It was found that 17β -estradiol delayed the initiation of germination, increased the total biomass of the samples, and reduced the amount of fully matured plants. These plants were extracted with newly created procedures using different variations of ethanol, HCl, hexane and ethyl acetate. These extracted samples were then analyzed with the use of High Performance Liquid Chromatography (HPLC). 17β -estradiol was detected in three out of four treatments ranging from 1.6 ppm to 11.36 ppm. The detection of 17β -estradiol in plants raises important questions about the potential of harmful chemicals reaching humans through the terrestrial food chain.