Human health risk assessment of selected endocrine disrupting phenolic compounds in potable water and treated wastewater effluent in the Western Cape, South Africa

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Abstract

Water resources are under threat by industrial and agricultural pollution due to the release of organic contaminants such as phenol into water bodies. This reduces water quality, thereby decreasing the availability of clean water. Samples of the Stellenbosch wastewater treatment plant effluent tap water, and four brands of bottled water were analyzed for the two phenolic compounds; 4-CP and 2,4-DCP using the HPLC/DAD. The phenolic compounds were both below the regulatory limits in all the samples analyzed. The concentrations of 2,4-DCP in the WWTP effluent, tap water and bottled water brands 'A', 'B', 'C'and 'D' ranged from; ND-5.40×10^{-6}, ND- 1.90×10^{-5}, ND-1.31×10^{-5}, 3.68×10^{-6} - 1.37×10^{-5}, ND-6.85×10^{-6} and 6.28×10^{-6} - 1.47×10^{-5} respectively. Corresponding values for 4-CP were 4.04×10^{-6} - 5.61×10^{-5}, 9.96×10^{-6} - 1.90×10^{-5}, ND-5.81×10^{-6}, ND-6.95×10^{-6}, ND-9.78×10^{-6} and 8.90×10^{-7} - 6.74×10^{-6} (mg/L) respectively.

Keywords: Endocrine disruptors, 4-CP, 2,4-DCP, waste water effluent, bottled water, tap water