

Oestrogenic activity in drinking waters from a rural area in the Waterberg District, Limpopo Province, South Africa

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Abstract

In South Africa, limited data are available regarding possible oestrogenic activity in the aquatic systems and especially drinking water. Water in the rural areas is often contaminated with a complex mixture of toxic compounds originating from nearby industries, agriculture and households. In these rural areas the only access to drinking water is boreholes, natural springs and rivers. Thus human exposure to environmental contaminants in drinking water is potentially high. Two rural communities near Mokopane in the Waterberg district of the Limpopo Province were selected in order to screen for oestrogenic activity in drinking water sources in a rural area. Eleven 1 l water samples (Molekane n= 4; Sekuruwe n= 7), were collected in prepared glass bottles and extracted on a SPE C18 cartridge and reconstituted into ethanol. The recombinant yeast oestrogen screen was used to determine the oestrogenic activity in the extracts. 17 β -estradiol (E2) was used as a positive control and the results were expressed as estradiol equivalents (EEq). The EEq of the water from both the communities ranged between 0.63 - 2.48 x10⁻⁹ g/l. These concentrations are similar to other studies conducted in Korean river waters in rural and city areas and Flemish surface waters. The recombinant yeast screen confirmed oestrogenic activity in the drinking water samples; further investigation is necessary to determine the source of the contamination and association with impaired growth.

Keywords: recombinant yeast screen, oestrogenic activity, water, rural, Limpopo, South Africa