

Pharmaceuticals, hormones, plasticizers, and pesticides in drinking water

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Abstract

Humans are exposed to endocrine disrupting compounds (EDCs) in tap water via drinking water. Currently, most of the analytical methods used to assess a long list of EDCs in drinking water have been made available only for a single group of EDCs and their metabolites, in contrast with other environmental matrices (e.g., surface water, sediments, and biota) for which more robust methods have been developed that allow detection of multiple groups. This study reveals an analytical method of one-step solid phase extraction, incorporated together with liquid chromatography-tandem mass spectrometry for the quantification of multiclass EDCs (i.e., pharmaceuticals, hormones, plasticizers, and pesticides) in drinking water. Fifteen multiclass EDCs significantly varied in amount between field samples ($p < 0.05$), with a maximum concentration of 17.63 ng/L observed. Daily exposure via drinking water is unlikely to pose a health risk (risk quotient < 1). This method serves as an analytical protocol for tracing multiclass EDC contamination in tap water as part of a multibarrier approach to ensure safe drinking water for good health and well-being. It represents a simpler one-step alternative tool for drinking water analysis, thereby avoiding the time-consuming and expensive multi-extraction steps that are generally needed for analyzing multiclass EDCs.

Keywords: Endocrine disrupting compound (EDC); Health risk assessment; SPE-LC-MS/MS; Tap water; Water security.