

OCCURRENCE OF HORMONES IN THE SCHELDT ESTUARY: AN ANALYTICAL CHALLENGE!

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In recent years, scientific concern, public debate and media attention has risen about the presence of natural and synthetic compounds in the environment. This is due to the observation that low environmental concentrations may affect human and wildlife.

The aim of the presented study was to develop and evaluate analytical approaches for the detection of different groups of endocrine disrupting chemicals in environmental matrices, e.g. water, sediments, suspended solids and biota. More specific, the aim was to develop analytical methods for the detection of these compounds in the low ng.l^{-1} or ng.g^{-1} level.

At first, the issue of endocrine disruption will be introduced. This study was carried out within an interdisciplinary research project, Endis-Risks (<http://www.vliz.be/projects/endis>). This four-year project focused on the distribution, exposure and effects of endocrine disrupting chemicals in the Scheldt Estuary (B-NI). In this presentation, the emphasis will be laid on the detection of estrogens. In order to understand the possible risks of the environmental occurrence of these compounds, their chemistry, their use, their potential for endocrine disruption and their environmental occurrence will be presented.

Next, the development and validation procedure for the analytical methods that enable (routine) analysis of environmental samples for estrogens in concentrations in the low ng.l^{-1} or ng.g^{-1} range will be described. The methods included speedisk or ASE extraction and detection with gas chromatography coupled to multiple mass spectrometry (GC-MS²).

Finally, the results of a four-year-(2002-2005) research on the occurrence of oestrone (E1), estradiol (E2) and ethinylestradiol (EE2) in the Scheldt Estuary will be presented. Similar to what has been reported for fresh water environments and waste waters, it was demonstrated that estuarine waters and the associated suspended matter and sediments are contaminated with the same estrogenic compounds and within the same order of magnitude. Oestrone (E1), the degradation product of E2, the most important female hormone was detected most frequently and in the highest concentrations. Low ng.l^{-1} and ng.g^{-1} of E1 and β -E2 (β isomer of E2) were detected both in water, sediment and suspended matter samples, whereas concentrations of EE2 were below the limit of quantification (LOQ).