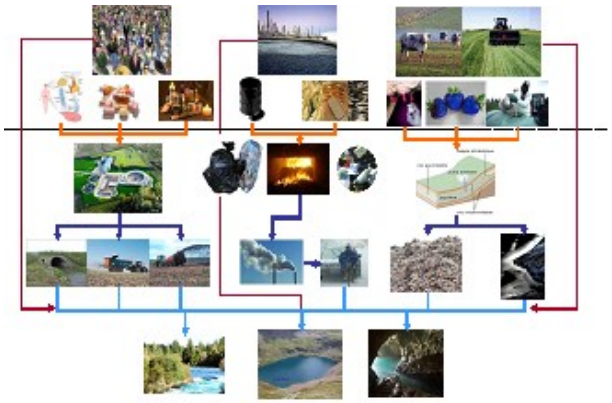
CONTEXT

Urban and environmental waters contain thousands of chemicals that can disrupt hormonal balance of living organisms and affect environmental health at low concentrations. A large number of studies have established that these micropollutants represent a hurdle in achieving a good ecological status of water bodies.

Water management is one of the World environmental priorities.

Sustainable water management requires new biotechnology based tools to provide comprehensive water diagnosis to authorities, scientists, end-users and stakeholders.

The aim of the BIOTTOPE project is to implement a new system, based on small biologic aquatic models, to assess water quality and the performance of wastewater treatment systems.



Emerging pollutants sources

CONTACTS

VERI

Chemin de la Digue
78603 Maisons-Laffitte Cedex
France
Tel : +33 (0)1 34 93 31 31
Fax : +33 (0)1 34 93 31 10
Email : luis.castillo@veolia.com
gaelle.meheut@veolia.com
www.veolia.com/en/innovation/research-innovation/

WATCHFROG
Pépinière Genopole Entreprises
4 rue Pierre Fontaine
91000 Evry
France
Tel : +33 (0)1 69 36 11 15
Fax : +33 (0)1 69 36 11 19
Email : lemkine@watchfrog.fr

www.watchfrog.fr

http://www.biottope.eu/

BIOTTOPE

LIFE11 ENV/FR742

BIological tools to Optimize Treatment Technologies to remOve micro Pollutants and Endocrine disrupters

2012—2014

WITH THE CONTRIBUTION OF THE LIFE FINANCIAL INSTRUMENT OF THE EUROPEAN UNION, GRANT LIFE11 ENV/FR/742

PROJECT DESCRIPTION

BIOTTOPE project's objectives are to increase water quality by using a new treatment technology; and to develop an automated tool for monitoring raw and treated water directly on site based on the biological impact of the chemicals.

Small aquatic models, larvae of fish and amphibians, are well documented biosensors. Very early stages of amphibian and fish, just after hatching of the eggs, are very sensitive to micropollutants. In these aquatic sentinels, the physiological targets of endocrine disruptors are tagged by fluorescent biomarkers.

The deliverable of BIOTTOPE is to create a rating system that specifies water treatments and assesses the value of produced water to favor biodiversity.

Administrative data

Project reference : LIFE11 ENV/FR/000742

Duration: 01-JUN-2012 to 31-DEC -2014

Total budget: 2,417,166.00 €

EU contribution: 1,193,583.00 €

Project location: Brussels Belgium and île de France, France.

Beneficiaries:

1. **VERI**
2. **WatchFrog**

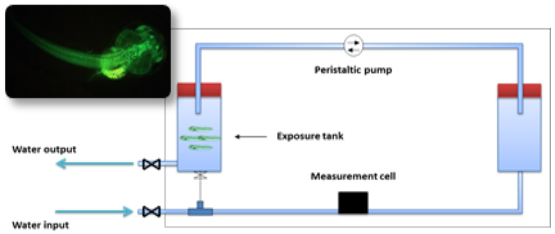
TECHNICAL DESCRIPTION

A) Micropollutants removal

Evaluation of water treatment technology based on activated carbon adsorption and on a high speed settling step (Actiflo® Carb) to remove micro-pollutants such as Endocrine Disruptors Compounds (EDCs).

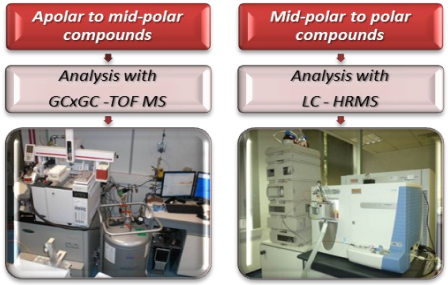
B) Water quality monitoring

B.1. To assess water quality, major biological functions targeted by contaminants are tagged with genetic fluorescent biomarkers. As an example, fish eggs production is a well-established target of chemicals affecting reproduction. Associated with fluorescence, this bio-indicator will allow quantifying the polluting potential of a mixture of contaminants. Translucency of the early larval stages of aquatic organisms allows robotized read-out of the fluorescence.



RESULTS&PERSPECTIVES

B.2. Micropollutants are analyzed with two screening techniques. Apolar and semi-polar molecules are extrated with the sensitive Stir Bar Sorptive Extraction (SBSE) and analyzed by in-line thermal desorption and comprehensive two-dimensional gas chromatography coupled to mass spectrometry (GCxGC TOF MS). Polar and mid-polar compounds are extracted with a large scale liquid/liquid extraction protocol and analysed on a LQT-Orbitrap high resolution mass spectrometer (LC -HRMS).



RESULTS

Taking into account the complexity of mixture of contaminants issued from human activities, biotechnology and robotized tools are now required to provide a continuous monitoring of the ecological value of water.

An obvious example of this value is demonstrating the capacity of tertiary treatment technologies as adsorption on activated carbon to remove micropollutants that impact the endocrine system in living organism.

Together with untargeted chemical analysis, this will allow investigating the responsibility in environmental contamination with the aim of reduction at source.