

# PRIORITIZATION OF PHARMACEUTICAL CONTAMINANTS IN THE ENVIRONMENT AFTER EVALUATION OF 10 YEARS IN-HOUSE MONITORING DATA FOR ANALYTICAL METHOD UPGRADE

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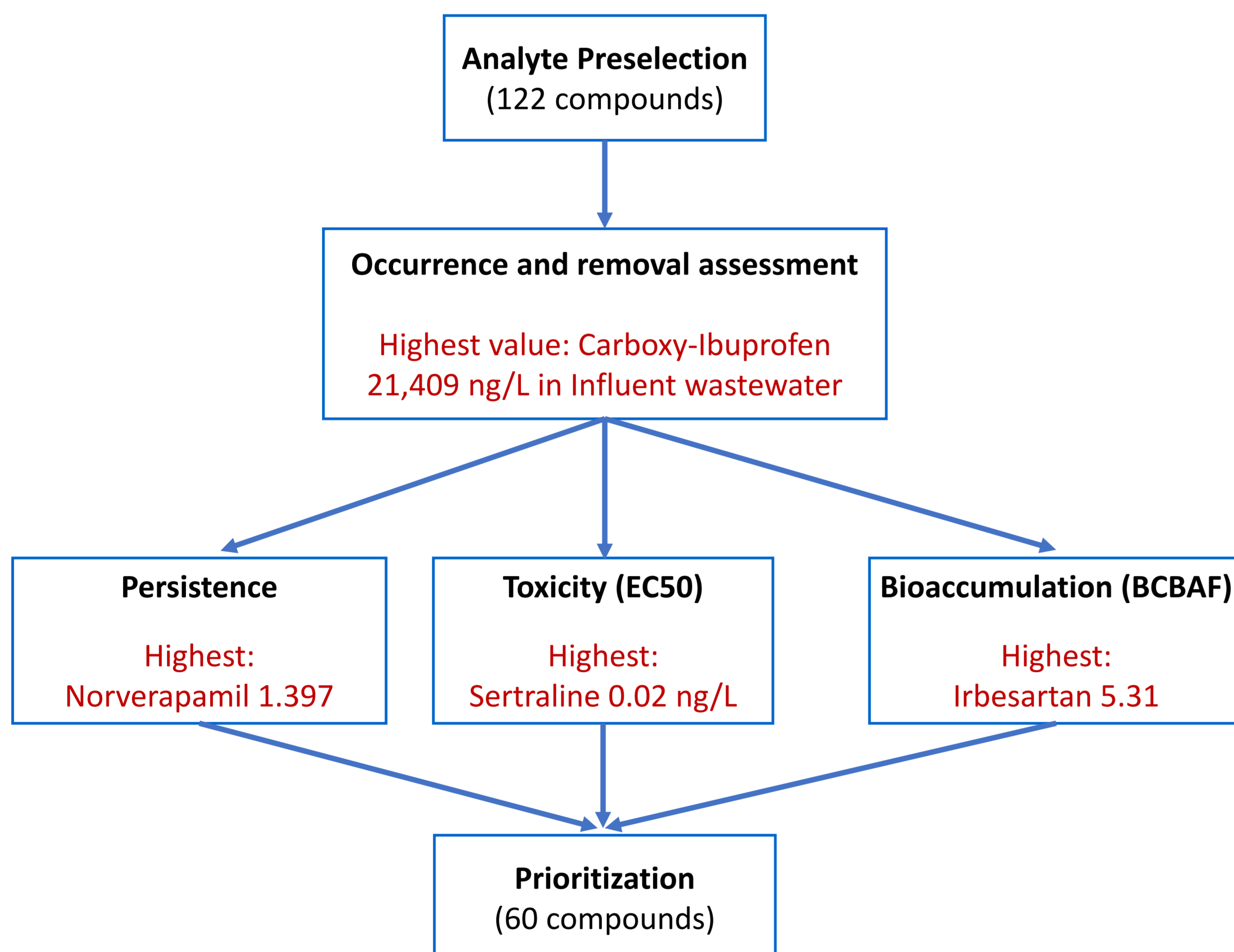
## INTRODUCTION

In the last years, one of the main concerns about environment contamination has been the presence of the so-called **emerging pollutants**. In order to monitor these compounds in environmental matrices, including natural and wastewater, specific analytical methodologies need to be developed.

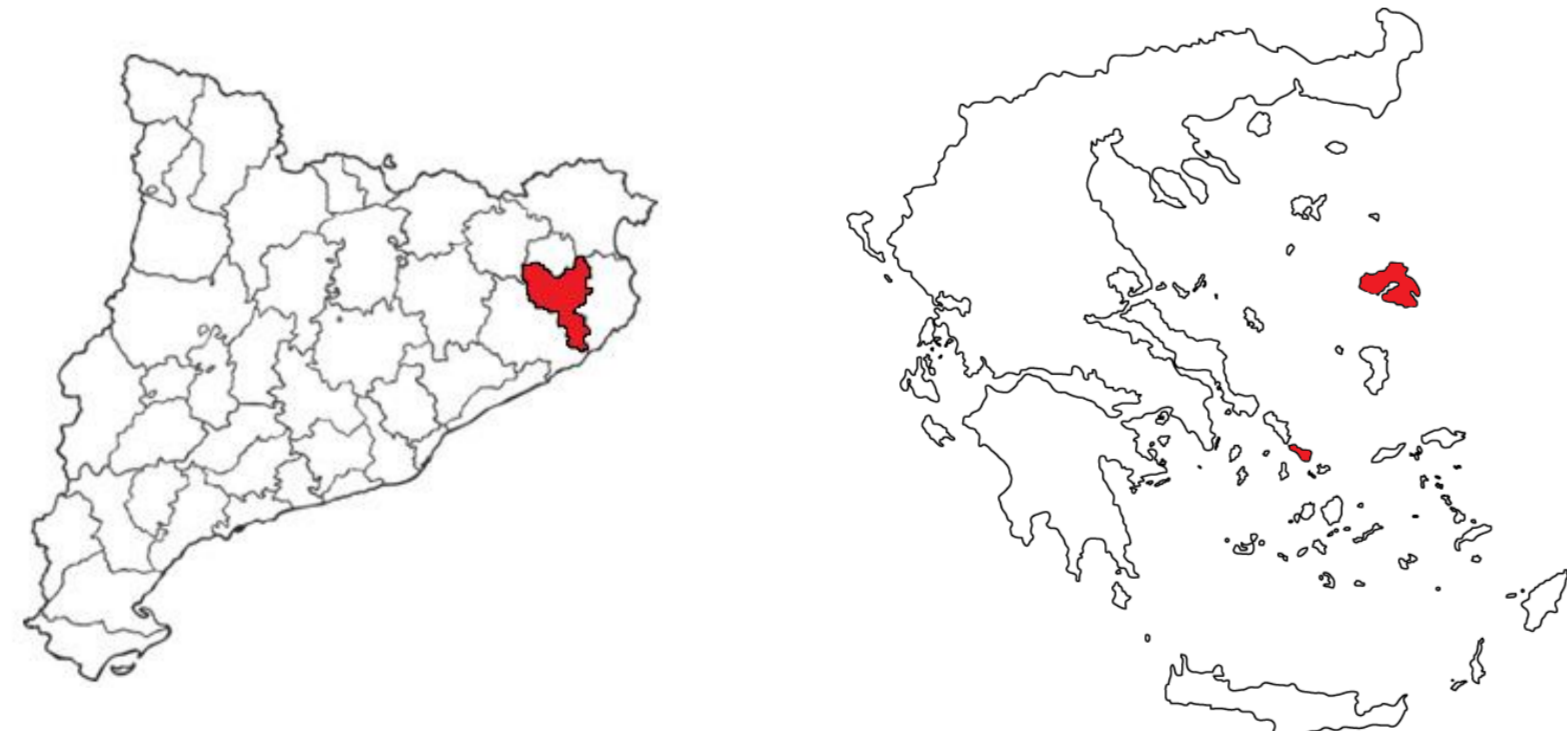
The **target methodologies**, with a preselection of the compounds of interest, are the commonly applied analytical strategies. However, some of the target compounds can eventually not be detected in the samples while some could remain unspotted. While in the later years non-target and suspect screening methodologies (where no standards are required), have gained importance in order to cover a broader set of compounds, they can provide only semiquantitative information or tentative identification of the molecules. Therefore, target methodologies are still the best option to perform a monitoring, and, selecting the analytes correctly it's essential. This goal can be accomplished through a **prioritization strategy**, as we do in this work for pharmaceutical active compounds (PhACs).

## MATERIALS AND METHODS

### A. SELECTING THE MOST RELEVANT PhACs



### B. SAMPLING CAMPAIGNS



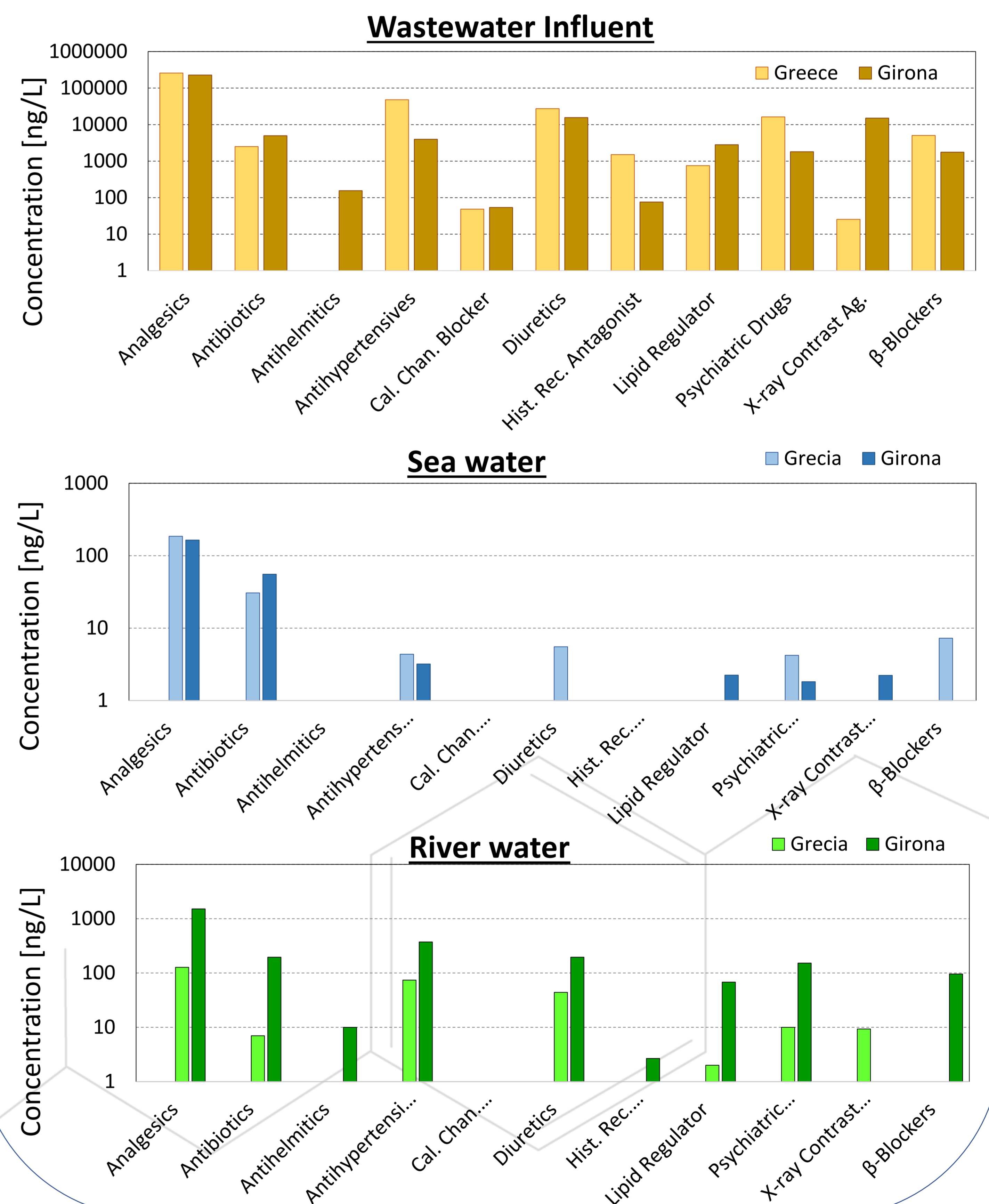
Sample	Girona (Spain)	Tinos and Lesbos (Greece)
Influent wastewater	WWTP Girona (101.852 inhabitants) Composite sample	WWTP Antissa (1700 inhabitants) 3 days composite sample
Effluent wastewater	WWTP Girona (101.852 inhabitants) Composite sample	-
River water	Ter River Upstream and downstream WWTP Grab samples	Voulgaris River Downstream WWTP Grab samples
Sea	Mediterranean Sea Near the mouth of Ter River Grab samples	Mediterranean Sea Taken from Tinos Grab sample

## RESULTS

### A. SELECTED COMPOUNDS

Therapeutic Class	Number of Compounds	Number of TPs
Antibiotics	20	4
Analgesics	13	3
Psychiatric Drugs	11	5
β-Blockers	5	1
Antihypertensives	3	0
Diuretics	2	0
Lipid regulator	2	0
Anthelmintic	1	0
X-ray contrast agent	1	0
Calcium Channel Blocker	1	0
Histamine Receptor Antagonist	1	0
<b>Total</b>	<b>60</b>	<b>13</b>

### B. SAMPLING CAMPAIGNS



## CONCLUSIONS

- After the prioritization process, **60 analytes** were selected and the **analytical methodologies have been upgraded** to analyze them in the same method
- 90% of the selected compounds** were detected in the samples from **Girona** and **85% in Greece**
- The **river samples** taken after the wastewater treatment plant in Spain have higher concentrations of Pharmaceutical Active Compounds compared to Greece. The **difference is about 1 order of magnitude** for almost all the therapeutic classes.
- The therapeutic class having **higher concentrations** was the **analgesic** in all the matrixes (Wastewater influent and effluent; sea and river water) in both countries