

Evaluation of drinking water purification processes by micro-pollutant detection using a comprehensive LC/Orbitrap mass spectrometry approach

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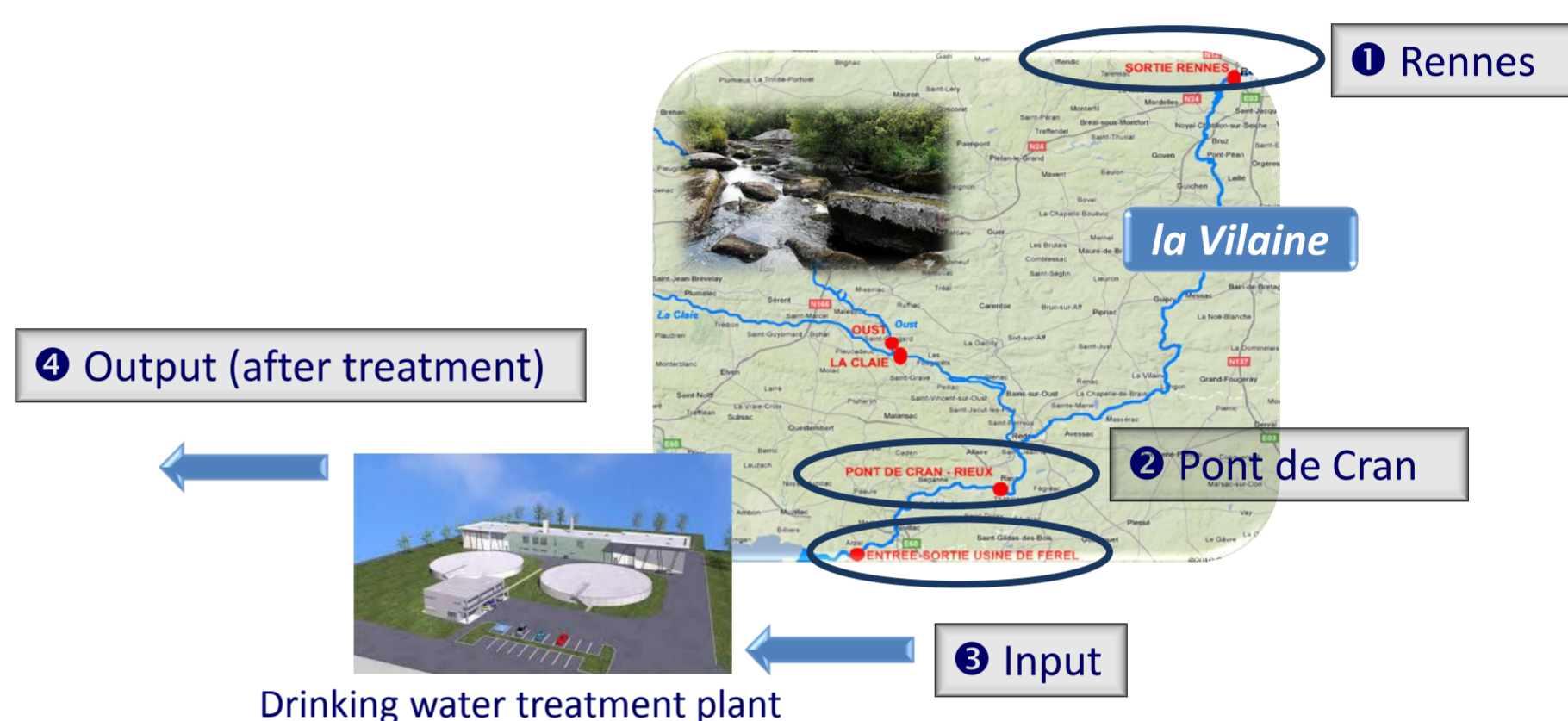
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INTRODUCTION

- Industrial waste, phytosanitary compounds and drugs often pollute environmental waters at the origin of drinking water. The presence of all these compounds at different concentrations in natural resources is a real environmental and public health concern.

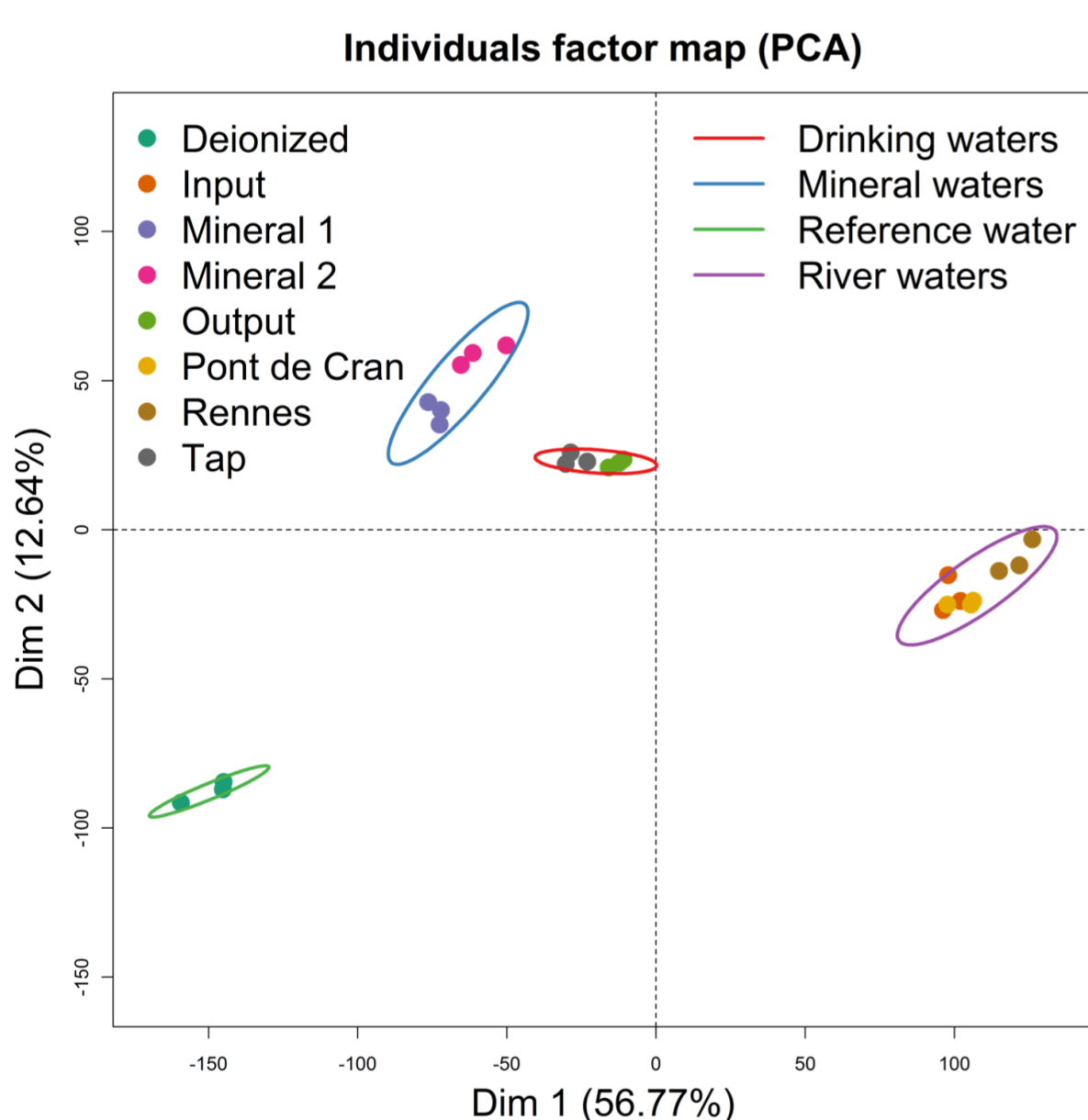
MATERIAL & METHODS

- Samples were taken upstream of a drinking water treatment plant located in Brittany (France) and after water treatment processes.
- Two mineral waters and a sample of tap water were also analyzed and a deionized water was used as reference.
- The monitoring of water quality by a global untargeted metabolomic approach was performed by high resolution mass spectrometry (Orbitrap™ technology) and electrospray ionization fitted with a liquid chromatography device.



RESULTS

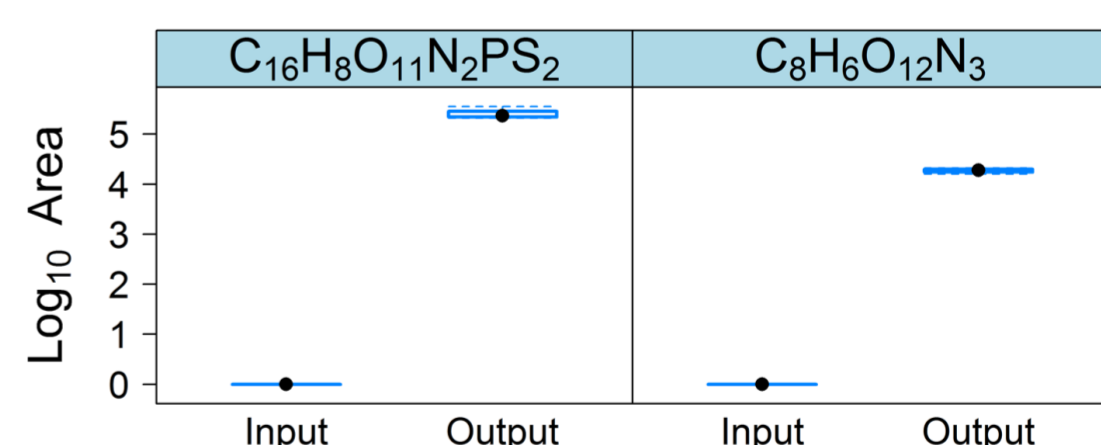
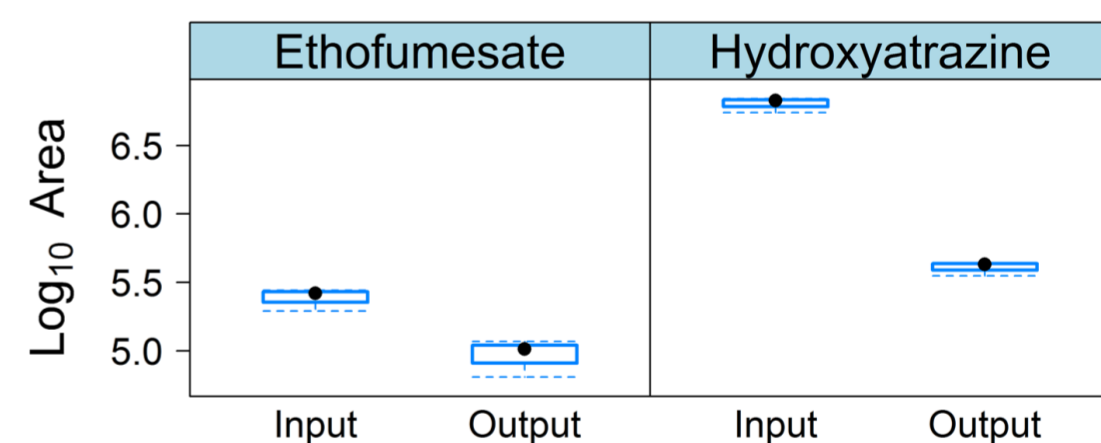
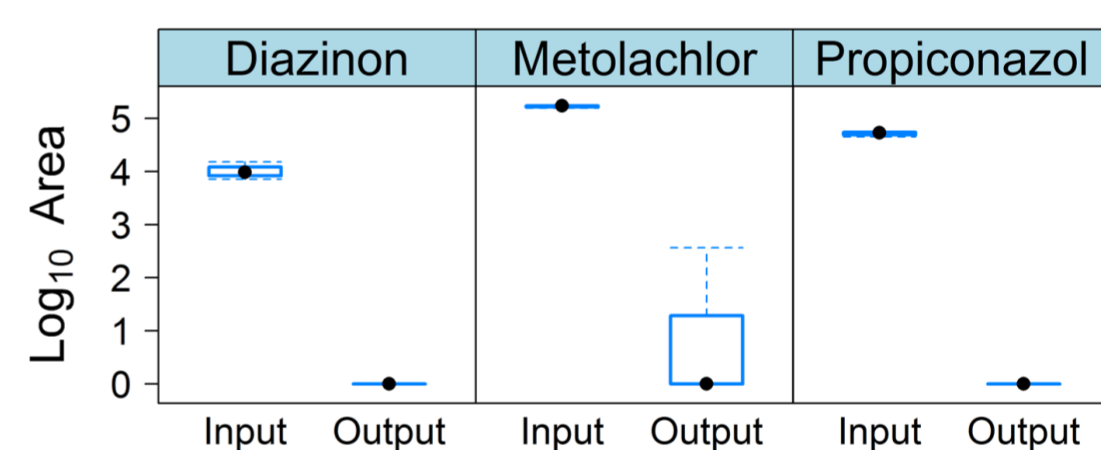
- Multivariate analysis clusters waters according to their status: river, drinking or mineral water.



- 32 pollutants are removed by the treatment

- 5 pollutants are partially removed

- New by-products are detected after the treatment



CONCLUSION

- River, drinking and mineral waters have distinct metabolic fingerprints that would require more samples to be characterized.
- The water treatment seems to produce several by-products detected at ultra-trace levels. The corresponding metabolic signals need to be further investigated for identification.
- 37 pollutants are detected using an untargeted metabolomic approach. This procedure is well adapted to explore water quality and direct prevention policies.

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