

# Organophosphate Flame Retardants Contamination in Surface Water and Sediment from the Coastal Area of Hong Kong

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## INTRODUCTION

Organophosphate flame retardants (OPFRs) have been defined as emerging environmental contaminants. The high demand for OPFRs and the restricted use of polybrominated diphenyl ethers led to the rapid increase in the production and consumption of OPFRs. OPFRs are not chemically bonded to the applied products, resulting in their release into the environment through abrasion and volatilization. OPFRs can persist in the environment and have been detected in water, sediment, and biota. Additionally, OPFRs have been proven to have endocrine-disrupting properties, neurotoxicity, and carcinogenicity to organisms, posing a substantial threat to the ecosystem. However, studies on the contamination levels and profile of OPFRs in surface water and sediment are still limited in some regions (e.g. Hong Kong).

## METHODS

For more details of the sample processing, please refer to the linked file in QR code.



## ACKNOWLEDGEMENT

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## RESULT & DISCUSSION

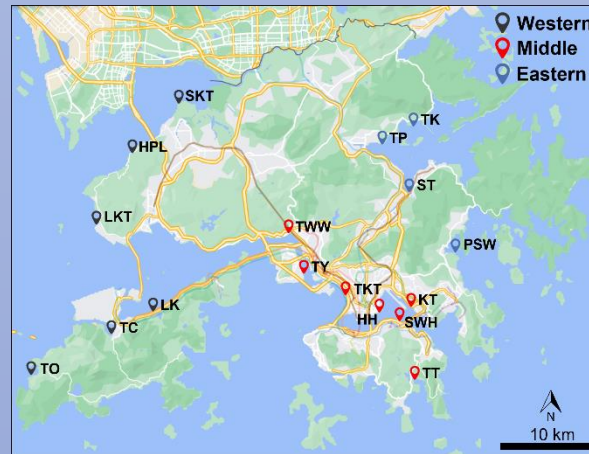


Figure 1. Sampling locations in Hong Kong coastal area

- OPFRs were detected from all seventeen locations in the coastal area of Hong Kong (Figure 1).
- The concentration of OPFRs in surface water ranged from 30.88 to 1011.81 ng L<sup>-1</sup> and in sediment from 9.62 to 544.53 ng g<sup>-1</sup> (Figure 2).
- Tris (2-chloroisopropyl) phosphate (TCPP) and tributyl phosphate (TBP) are the dominant OPFRs found in Hong Kong (Figure 3).
- The  $\Sigma$ OPFRs in surface water and sediment posed a moderate to high risk to the ecosystem system (Figure 4).

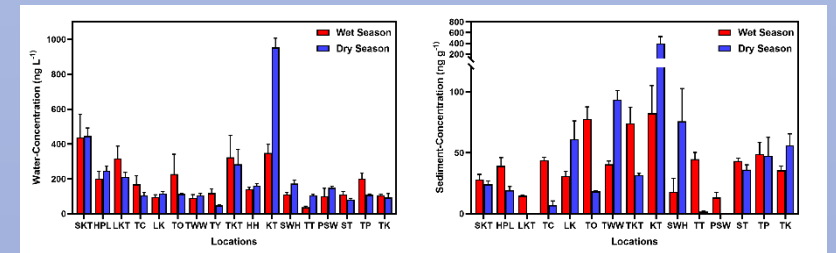


Figure 2. The concentration of OPFRs in surface water and sediment sample from seventeen locations in dry and wet season.

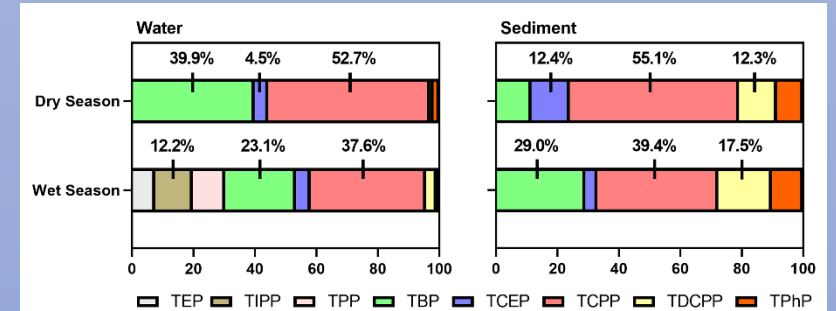


Figure 3. The composition of OPFRs in surface water and sediment samples from seventeen locations in dry and wet season.

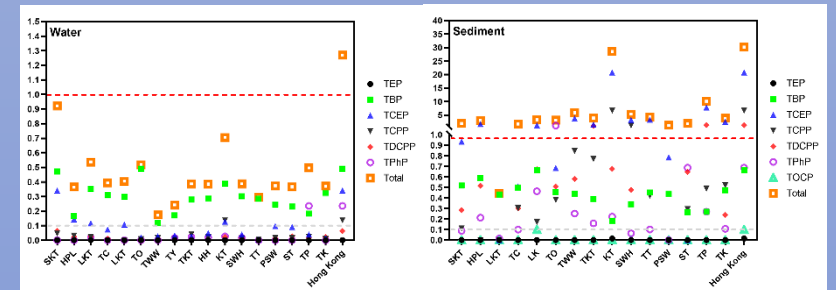


Figure 4. Ecological risk assessment of OPFRs in surface water and sediment samples from seventeen locations.