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Method Development for Comprehensive Extraction and Analysis of Marine Toxins: Liquid-Liquid Extraction and Tandem Liquid Chromatography Separations Coupled to Electrospray Tandem Mass Spectrometry.

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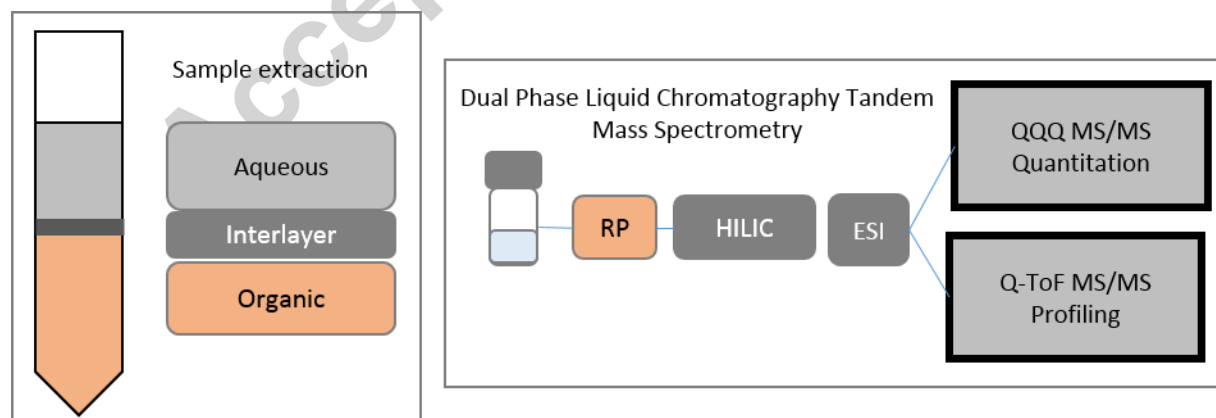
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Abstract

A variety of toxins are produced by marine and freshwater microorganisms that present a threat to human health. These toxins have diverse chemical properties and specifically, a range of hydrophobicity. Methods for extraction and identification of these toxins are often geared toward specific classes of toxin depending on the sample type. There is a need for a general method of toxin extraction and identification for screening samples where the likely toxin content is not known *a priori*. We have applied a general method for metabolite extraction to toxin containing samples. This method was coupled with a simple dual liquid chromatography approach for separating a broad range of toxins. This liquid chromatography approach was coupled to triple quadrupole and quadrupole time-of-flight MS/MS platforms. The method was testing on a fish matrix for recovery of palytoxin as well as marine corals for detection of natural mixtures of palytoxin analogues. The recovery of palytoxin was found to produce a linear response (R^2 of 0.95) when spiked into the fish matrix with a limit of quantitation of 2.5 ng/ μ L and recovery efficiency of 73% +/- 9%. The screening of corals revealed varying amount of palytoxin, and in one case, different palytoxin structural analogues. This demonstration illustrates the potential utility of this method for toxin extraction and detection.

Graphical abstract



Abbreviations

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