

Determination of organochlorine pesticide and polychlorinated biphenyl as pops residues in freshwater animals in Thailand during 2017-2018

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Abstrak

A rapid multiresidue method for the determination of 22 organochlorine pesticides and 7 polychlorinated biphenyl compounds as POPs contaminant was described. It involved the application of modified QuEChERS procedure followed by gas chromatography electron capture detector (GC ECD) analysis. The limits of detection (LOD) and quantification (LOQ) of the developed and validated method in fish tissue were 3 g/kg and 10 g/kg, respectively.

The following validation parameters were within acceptable range: specificity and selectivity, linearity, accuracy and precision (at levels: 10, 15 and 50 g/kg, the recovery test values were between 70 and 120% and HorRat 2, except hexachlorobenzene and methoxychlor). The application of the method was verified by analyzing a total of 182 freshwater animal samples produced and collected in Thailand during 2017-2018. Detectable POPs residues were found in 1.6% (3 shrimp samples) of the animal samples. One of the positive samples was contaminated with pp DDE which was DDT metabolite (<10g/kg). Two shrimp samples presented residue of PCB52 congener (<10 and 30 g/kg). No sample had contamination higher than the extraneous maximum residue limit (EMRL) set by Ministry of Public Health of Thailand and Codex. Based on the most risky freshwater animal, primary risk assessment using shrimp daily intake of Thai population data has shown that DDT and PCB compounds contained in shrimp are unlikely to pose any health risk to Thai consumers.