

Determination of organochlorine pesticides in shrimp by gas chromatography-mass spectrometry using a modified QuEChERS approach

ABSTRACT

Pacific white shrimp (*Litopenaeus vannamei*) collected during dry and rainy seasons from three different states in Malaysia were analyzed for nine organochlorine pesticides (OCPs) (α-HCH, β-HCH, γ-HCH, δ-HCH, trans-chlordane, cis-chlordane, p,p-DDE, p,p-DDD and p,p-DDT) using QuEChERS sample preparation method and GC-MS SIM with split/splitless injection mode. The efficiency of combination of primary and secondary amine (PSA) and octadecyl (C18) at 25 mg of PSA and 25 mg of C18 per mL of shrimp extract as the clean-up sorbent to remove matrix interferences was evaluated. By combining PSA and C18, matrix interferences such as gamma-tocopherol and cholesterol were not able to be eliminated. Good separation and high recoveries which ranged from 90 to 105% with associated RSD < 15% were obtained for all OCPs at 3675 ng/g. No significant difference in recoveries due to seasonal variation for studied OCPs, except for α-HCH, β-HCH, γ-HCH and p,p-DDT were obtained. The limits of detection and quantification ranged from 0.3 to 4.5 ng/g and 3 to 15 ng/g, respectively. The linearity for matrix matched standard calibrations was >0.99.

Keyword: QuEChERS; GC-MS; Shrimp; Recoveries; Organochlorines