Validation for an Enzyme-Linked Immnunoabsorbent Assay for Analysis of Occupational Exposure to Pyrethroid Deltamethrin

The standard calibration curve for Pyrethroid Deltamtrhin was developed by using an enzyme-linked immunosorbent assay (ELISA). The major metabolite of deltamethrin, 3-phenoxybenzoic acid (3-PBA), was detected and standardized to further quantify the amount of metabolites of urine samples in occupational exposure to deltamethrin. The assay was based on the protocol of Lee et al (2002) and Shan et al (2004). The results of performance of coating antigen (Cag06) and antibody (Ab-294) were approximately 0.25 ug/L and 1/4000 dilution, respectively. The assay parameters followed a four-parameter logistic equation. The concentration at 50% inhibition (IC50%) for standard deltamethrin was 0.48 µg/L and a limit of detection (LOD) was 0.1 µg/L. This study spiked urine samples with different concentrations of 3-PBA. The IC50% for spiked recovery was 0.60 µg/L and a limit of quantification (LOQ) was 0.1-0.2 µg/L. The percentage of spike recovery of 5, 25, and 50 ug/L were 101.3 ± 11.4, 104.8 ± 6.9, and 93.9 ± 11.9, respectively. The pilot study collected urine samples of five pyrethroid deltamethrin applicators. The urine samples will be analyzed by ELISA method. Finally, the results will be validated and compared with the LC-MS.