K17 Simultaneous Extraction of Pesticides From Human Adipose Tissues and GC/MS Detection

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After attending this presentation, attendees will understand the value of retaining alternative tissues for postmortem toxicological analyses.

This presentation will impact the forensic community and/or humanity by demonstrating the utility of alternative postmortem tissue analysis in determining defensible cause of death. The objective of this presentation is to relate experiences regarding use of adipose tissue, as a supplement to blood and other organs, for the postmortem identification of pesticides.

A modified method is presented[1] for the efficient extraction of pesticides from human adipose tissue. The procedure combines purification, extraction on Extrelut column and GC/MS analysis.

5 g adipose tissue pesticide free homogenate was spiked with 2.8 mcg/g of a mix of pesticides (73 ng/mL Dichlorvos, Fludioxonil, Methiocarb, Methomil, Chlorpyrifos, Thiamethoxam, Tebufenpyrad, Tebuconazol, Quinoxyfen, Pyrimethanil, Penconazol). The mixture was vortexed for 15 seconds and 10 g of anhydrous sodium sulphate and 0.5 g of tartaric acid added.

The homogenate was extracted three times with petroleum ether, followed by evaporation of the ether layer at room temperature under N_2. The residue was reconstituted in 20 mL of petroleum ether, filtered, and extracted with 5 mL of acetonitrile saturated with petroleum ether.
100 mL of a 5% NaCl aqueous solution was added to the acetonitirile/ether phase and extracted with an additional 10 mL of petroleum ether. The extract was again evaporated at room temperature under N_2.

5.5 g of florisil was activated (120°C, 30 min), and placed in an Extrelut column (Merck). The extract was reconstituted with 2.5 mL of petroleum ether and added to the column. The column was then eluted with 50:50 ethyl ether/petroleum ether and the eluate evaporated at room temperature under N_2. The residue was then reconstituted and injected into a GC/MS-EI operating in full scan mode.

This extraction procedure for pesticides in human adipose tissue was evaluated on the basis of accuracy, reproducibility, and chromatographic profile. The method is simple and rapid and produces relatively clean extracts, suitable for gas chromatography/mass spectrometry full scan EI analysis. The acidic purification/solid-phase extraction provided best compromise between recovery and chromatographic profile.

References:

1 Locani O.L.; Perkins de Piacentino A.M.; Ginesín L.M., Mangas L., Matrices Alternativas: Tejido Adiposo una Matriz de Eleccion, Cuadernos de Medicina Forense, 2005: 2 (3): 29-40

Adipose Tissue, Alternative Tissue, Pesticide

 ** Presenting Author*