



### **K32 Forensic Entomotoxicology: A Study in the Deposition of Amphetamines Into the Larvae of the Black Blow Fly, *Phormia regina***

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The goal of this presentation is to better understand the potential implications of using insects as a toxicological specimen.

This presentation will impact the forensic community and/or humanity by helping to build a database to better understand the utility using insects as a toxicological specimen.

Due to events in severe decomposition, either no soft tissue remains on which to perform a toxicological analysis or putrefactive fluids complicate and interfere with the analysis of the soft tissues. The purpose of this experiment was to study the trends in the deposition of amphetamines into the larvae of the black blow fly, *Phormia regina*, in order to better understand the value of entomological evidence as toxicological specimens. Drug deposition was analyzed by linear regression to find a correlation between whole larvae drug concentration and food source drug concentration. *P. regina* larvae were raised at 21°C on pork homogenized with three concentrations of ephedrine (36.5, 73, 146 mg/kg), methamphetamine (1.5, 3, 6 mg/kg), and fenfluramine (25, 50, 100 mg/kg). The middle dosage of each drug reflected the LD<sub>50</sub> of the drug in rabbits. At the end of the feeding stage, the larvae were harvested, washed, and frozen. Ten larvae were subsequently homogenized, diluted in 2 ml water, and subjected to a liquid-liquid extraction. The extracted drugs were derivatized with HFBA and analyzed by GC/MS. In the concentration ranges investigated, the concentrations of ephedrine, methamphetamine, and fenfluramine found in the larvae correlated with the concentration of the drug in the food source ( $R^2 = 0.9081$ ,  $0.9886$ , and  $0.8302$  respectively). Fenfluramine was the only drug which biotransformed in the larvae to a known metabolite, norfenfluramine. The concentrations of fenfluramine and norfenfluramine were added to reflect the total concentration of "fenfluramine" extracted from the larvae. As a result, the concentration of total fenfluramine in the larvae was found to correlate more strongly ( $R^2 = 0.9107$ ) with the concentration of drug in the food source. The data showed that with increasing concentrations of drug in the food source, the more drug that was accumulated in the larvae and subsequently extracted.

**Entomology, Toxicology, Amphetamines**