



B157 The Detection of Toxic Adulterants in Seized Drug Exhibits in Kentucky and Vermont

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After attending this presentation, attendees will be able to describe the number and variety of adulterants encountered in seized drugs in Kentucky and Vermont in the United States.

This presentation will impact the forensic science community by providing data on the prevalence of toxic and non-toxic adulterants in drug evidence seized from March 2015 through May 2017.

Cutting agents are constantly changing over time, increasing the risks to the user's health caused by the compound's interactions. Many laboratories in the United States perform seized drug analysis by an acid/base extraction of drug evidence. This may result in toxic adulterants being removed before the analytical phase. Also, most laboratories will report on only controlled substances in the Drug Enforcement Administration (DEA) list (Schedules I to IV) or per their state regulations. Both factors lead to under-reporting of other substances that may contribute to the adverse effect profile of illicit drug use.

Two hundred aliquots from seized drug exhibits from Kentucky and 315 samples from Vermont were received dissolved in methanol or ethanol and were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), followed by Liquid Chromatography/quadrupole Time-Of-Flight/Mass Spectrometry (LC/qTOF/MS) after dilution (1:100) of the neat sample in mobile phase. The samples were received deidentified, but were assigned an in-house identifying number, linked to the date of receipt for analysis by the originating lab and the zip code or county of origin.

Overall, the most prevalent toxic adulterant found was caffeine (31.0%), followed by quinine/quinidine (24.7%), levamisole (11.6%), acetaminophen (8.2%), and procaine (8.2%). In Kentucky, levamisole (18.0%) was the most prevalent toxic adulterant detected, followed by caffeine (15.0%), diphenhydramine (14.0%), quinine/quinidine (11.0%), and lidocaine (8.0%), while in Vermont, the most prevalent was caffeine (46.2%), followed by quinine/quinidine (37.7%), procaine (16.0%), carisoprodol (15.0%), and diltiazem (10.3%).

The seized drugs of abuse identified overall were as follows: heroin (117 samples), cocaine (85 samples), methamphetamine (61 samples), fentanyl and analogs (40 samples), MDA/MDMA (4 samples), and U-47700 (4 samples). Heroin was primarily adulterated with caffeine (50.4%) and quinine/quinidine (41.8%), as well as fentanyl and analogs (caffeine in 74.0% of the samples, quinine/quinidine in 51.6% of the samples). Cocaine was primarily adulterated with caffeine (35.2%) and levamisole (28.2%). Caffeine was also the main adulterant identified in U-47700 samples (75.0% of the samples). The methamphetamine samples were less adulterated in general; the most prevalent adulterants identified in those samples were diphenhydramine and caffeine in 6.5% and 4.9% of the samples, respectively. The four MDA/MDMA samples identified in this batch were not adulterated.

In Kentucky, the majority of the samples were methamphetamine, of which some were adulterated with diphenhydramine (6.5%) or caffeine (4.9%), and cocaine mostly adulterated with levamisole (33.3%), caffeine and diphenhydramine (22.2%). By contrast, in Vermont, most of the samples were heroin adulterated with caffeine (48.9%) and quinine/quinidine (41.6%), and cocaine adulterated with caffeine (58.0%), quinine/quinidine (29.0%), and procaine (25.8%).

Knowledge concerning the toxic adulterants is important for the management of acute intoxications and also in criminal investigations, helping in the identification of routes of trafficking; however, common reporting practices frequently do not provide information regarding the prevalence of these toxic adulterants.

Seized Drug, Cutting Agents, Toxicity