DEA TOX

DRUG ENFORCEMENT ADMINISTRATION

TOXICOLOGY TESTING PROGRAM

QUARTERLY REPORT

Third Quarter – 2023

U.S. Department of Justice
Drug Enforcement Administration
Diversion Control Division
Drug and Chemical Evaluation Section

Contents

Introduction

The Drug Enforcement Administration's Toxicology Testing Program (DEA TOX) began in May 2019 as a surveillance program aimed at detecting new psychoactive substances within the United States. In response to the ongoing synthetic drug epidemic, the Drug Enforcement Administration (DEA) awarded a contract with the University of California at San Francisco (UCSF) to analyze biological samples generated from overdose victims of synthetic drugs.

In many cases, it can be difficult to ascertain the specific substance responsible for the overdose. The goal of DEA TOX is to connect symptom causation to the abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, synthetic opioids, other hallucinogens, etc.).

DEA has reached out to local health departments, law enforcement partners, poison centers, drug court laboratories, hospitals, and other medical facilities to offer testing of leftover or previously collected samples for analysis of synthetic drugs. DEA TOX is interested in patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted). DEA TOX may approve testing of unused biological samples or on occasion non-biological samples from a medical facility or law enforcement partner only.

Requests for testing may be submitted directly to DEA TOX (**DEATOX@DEA.GOV**). Upon explicit approval of the request for testing of specific samples, the originating laboratory is invited to send their samples to the Clinical Toxicology and Environmental Biomonitoring (CTEB) Laboratory at UCSF. DEA covers the full cost of analysis for each sample approved for testing. Using liquid chromatography quadrupole time-of-flight mass spectrometry, synthetic drugs identified within the samples are confirmed and quantified.

The CTEB laboratory currently maintains a comprehensive drug library consisting of 1231 drugs, of which 963 are new psychoactive substances (NPS).

This publication presents the results of cases analyzed and completed by the CTEB laboratory from July 1, 2023, through September 30, 2023. Confirmed levels denoted in the tables below with a defined range represent the low and high concentrations reported when the frequency of detection is greater than one.

Summary

Between July 1, 2023 and September 30, 2023, 119 biological samples from 113 cases originating from 16 states namely, Arizona (1), California (1), Colorado (1), Florida (19), Illinois (3), Kentucky (21), Louisiana (1), Maryland (8), Maine (2), Nebraska (17), New Mexico (1), Ohio (6), Tennessee (27), Texas (2), Utah (2), and Virginia (1) were analyzed by DEA TOX. These samples were analyzed for NPS, traditional illicit drugs (TID), prescription or over-the-counter (OTC) drugs, dietary supplement stimulants (DSS), and precursors, additives and impurities (P/A/I). The biological samples submitted consisted of 13 serum, 8 plasma, 82 whole blood, and 16 urine samples. Six drug product samples were also analyzed originating from California (1), Florida (1), Maine (2), Texas (1), and Virginia (1).

DEA TOX identified and confirmed a total of 730 drugs and metabolites that consisted of 88 NPS detections, 239 TID detections, 303 prescription or OTC drug detections, 4 DSS, and 96 P/A/I detections in biological samples during this reporting period (Fig. 1A)[1]. While some drugs identified could be placed in more than one category, for purposes of this report and for consistency, DEA TOX placed such substances in a single category only. Many prescription drugs that are commonly abused and encountered are listed as TID. Substances that are not approved by the Food and Drug Administration for medical use within the U.S. are considered NPS.

A breakdown of the 730 total drug and metabolite confirmations demonstrated 125 different drugs, which consisted of 24 NPS, 24 TID, 68 prescription or OTC drugs, 3 DSS, and 6 P/A/I (Fig. 1B).

Of the cases submitted this quarter, 43 out of the 113 cases (38.1%) detected at least one NPS. In addition, 45 out of the 113 cases (39.8%) contained fentanyl.

For the third quarter 2023, when reporting the frequency in which an NPS was identified, it will also note the number of fatal cases. For example, a frequency denoted as 12 [5] would refer to 12 total cases, of which 5 were fatal.

Fig. 1A Detection frequency

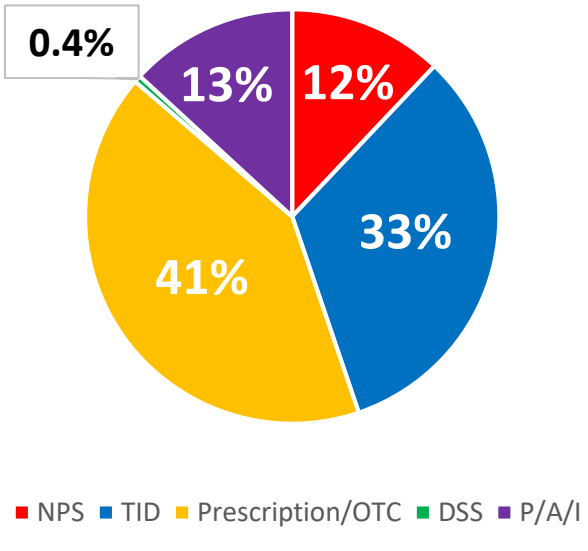
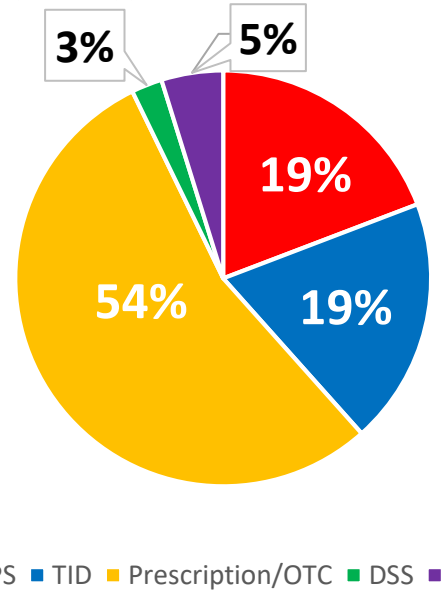


Fig. 1B Types of Drugs Detected



New Psychoactive Substances

DEA TOX confirmed 88 detections comprising of 21 NPS[§] (Table 1) from six different classes of drugs (Figure 2A) in biological samples in the third quarter of 2023. The total encounters for each NPS class are summarized in Figure 2B. An additional three NPS detections from drug products are described in Table 6.

Figure 2A. Number of Substances Identified for Each NPS Class

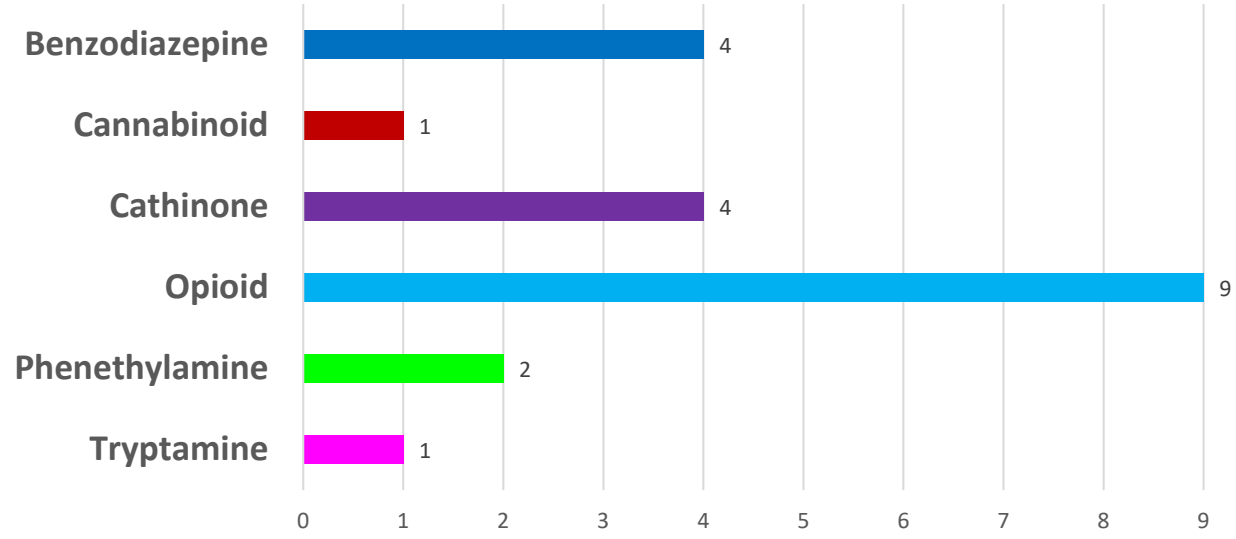


Figure 2B. Total Encounters for Each NPS Class

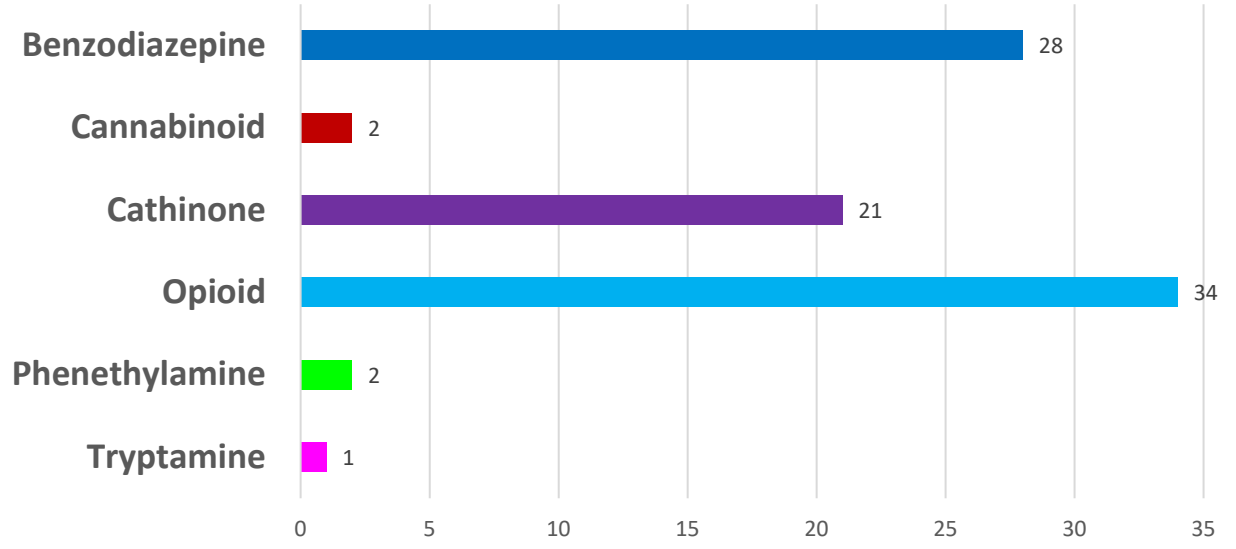


Table 1. NPS detected in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq. [Fatal]	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Benzo-diazepine (4)	8-Amino Clonazolam	4 [4]	TN (4)			2.1-16.3	
	Clonazolam	2 [2]	TN (2)			0.4-0.8	
	Bromazolam	17 [15]	KY, MD (2), TN (13), UT	93.7		0.2-435	1030
	Etizolam	1 [1]	TN			0.2	
	Flubromazepam	4 [4]	MD (2), TN (2)			1.5-17.6	
Cannabinoid (1)	11-nor-9-carboxy-delta-8-THC	2 [0]	KY (2)	1440	477		
Cathinone (4)	Eutylone	2 [2]	TN (2)			1.1-4.9	
	N-Cyclohexylmethylone	1 [1]	FL			679	
	N,*N*-Dimethylpentylone	9 [9]	FL (7), MD, TN			18.9-586	
	Pentylone	9 [9]	FL (7), MD, TN			1.8-671	
Phenethyl-amines (2)	2C-B-Fly	1 [1]	FL			0.2	
	3C-B-Fly	1 [1]	FL			0.2	
Tryptamines (1)	*N*,*N*-Dimethyltryptamine	1 [0]	IL				18.1

Table 1 (Continued). NPS in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq. [Fatal]	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Opioid (9)	Furanyl UF-17	1 [1]	MD			38.4	
	Metonitazene	3 [3]	TN (3)			0.2-3.6	
	Mitragynine	7 [4]	CA, FL, KY (2), TN (3)	117		0.6-1560	1010
	7-OH Mitragynine	4 [1]	CA, KY (2), FL	46.5		51.8-66.6	5120
	N-Desethyl Isotonitazene	7 [7]	MD, TN (6)			0.7-290	
	N-Methyl Norfentanyl	1 [0]	UT				24.3
	N-Pyrrolidino Etonitazene	1 [1]	TN			8.8	
	para-Fluorofentanyl	4 [4]	FL, TN (3)			0.4-19.5	
	Despropionyl *para*-fluorofentanyl	3 [3]	TN (3)			0.2-0.7	
	Protonitazene	1 [1]	TN			1.2	
	Tianeptine	2 [1]	TN, VA	4240		31.3	

* CA – California; FL – Florida; IL – Illinois; KY – Kentucky; MD – Maryland; TN – Tennessee; UT – Utah; VA – Virginia

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Traditional Illicit Drugs

DEA TOX confirmed 239 detections of 17 TIDs[§] (Table 2) in biological samples in the third quarter of 2023. Two additional TID detections from drug products are described in Table 6.

Table 2. TID Detected in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Amphetamine (3)	4-OH Methamphetamine	2	UT, KY				152-1760
	Amphetamine	6	UT, KY, TN (4)			43.9-333	771-6310
	Methamphetamine	26	FL (3), KY, NE (7), TN (14), UT			3.1-9580	7220-102000
	MDMA	2	KY, IL	1630			1020
	HMMA	1	KY				162
Arylcyclo-hexylamine (2)	Ketamine	8	CA, FL, IL, KY, OH (2), TN (2)	7.8-136	814	41.4-5530	156-32300
	PCP	1	MD			22.2	
Cannabinoid (1)	11-nor-9-carboxy-delta-9-THC	9	FL, IL, KY (5), OH, TX	71.1		30-133	
	Delta-9-THC	1	FL			9.1	
Cocaine (1)	Benzoylecgonine	24	FL (4), IL, KY (4), MD (3), NE (6), TN (6)	534	32.4	0.3-1200	
	Cocaethylene	5	FL, NE (3), TN				
	Cocaine	16	FL (2), IL, KY, MD (2), NE (5), TN (5)	1.4		0.3-168	
	Ecgonine Methyl Ester	19	FL (3), IL, KY (2), MD (2), NE (6), TN (5)	NQ			

Table 2 (Continued). TID in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Opioids (8)	Beta-hydroxy Fentanyl	14	FL, KY, MD, NE, NM, TN (8), UT	2.1		0.3-10.7	63.8
	Codeine	2	UT, LA			1.8	23.2
	Fentanyl	45	CA, FL (4), IL, KY (4), MD (2), ME, NE (10), NM, TN (20), UT	16.0-26.6	0.9-3.3	1.1-76.3	57.5-439
	Norfentanyl	37	CA, FL (3), KY (5), MD (2), NE (9), NM, TN (15), UT	0.4-7.7	0.8-1.5	0.2-20.7	254-5230
	Hydrocodone	2	IL, TN			2.4	2010
	Hydromorphone	5	IL, KY, LA, TN, UT			1.6-3.1	42.7-361
	Morphine	6	IL, KY, TN (3), UT			0.9-3.0	53.6-1750
	Oxycodone	3	KY, LA, TN			3.1-73.2	
	Tramadol	1	TN			0.7	
Stimulant Alkaloids (1)	Nicotine	2	AZ, NE	NQ			
	Cotinine	1	TX	NQ			
Tryptamines (1)	Psilocin	1	FL			101	

* CA – California; FL – Florida; IL – Illinois; KY – Kentucky; LA – Louisiana; MD – Maryland; ME – Maine; NE – Nebraska; NM – New Mexico; OH – Ohio; TN – Tennessee; UT – Utah;

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine; NQ – not quantified

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Prescription and Over the Counter Drugs

DEA TOX confirmed 303 detections of 57 prescription or OTC drugs§ (Table 3) in the third quarter of 2023. Drugs for the prescription/OTC drugs panel are not typically quantitated unless specifically requested thus "Confirmed Levels" are not provided.

Table 3. Prescription or OTC drugs detected in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq.	States Found*
Amphetamine (1)	Pseudoephedrine	4	FL, TN (3)
Anesthetic (2)	Lidocaine	9	FL (2), IL, MD (2), NE, OH, TN (2)
	Medetomidine	1	MD
Antibiotic (2)	Levofloxacin	2	TN (2)
	Sulfamethoxazole	3	IL, KY, NE
Anticoagulant (1)	Warfarin	1	TN
Anticonvulsant (6)	Carbamazepine	1	FL
	Gabapentin	10	NE (2), TN (8)
	Lamotrigine	2	IL, OH
	Levetiracetam	2	MD, NE
	Oxcarbazepine	1	FL
	Topiramate	1	TN
Antidepressant (10)	Amitriptyline	5	FL, IL, KY, NE, TN
	Citalopram	6	NE, TN (4), UT
	Fluoxetine	4	FL, MD, ME, OH
	mCPP**	7	FL (2), KY (2), NE, OH, TX
	Mirtazapine	4	MD, NE, TN, UT
	Norfluoxetine**	3	FL, MD, OH
	Nortriptyline**	3	IL, KY, NE
	Paroxetine	1	TN
	Protriptyline	2	KY (2)
	Sertraline	4	KY, OH, TN (2)
	Trazodone	11	FL (2), KY (3), MD, NE (2), NM, OH, TX
	Venlafaxine	1	TN

**Compounds are expected metabolites of parent drugs, as follow:

Expected Metabolite	Parent Drug
mCPP	Trazodone
Norfluoxetine	Fluoxetine
Nortriptyline	Amitriptyline

Table 3 (Continued). Prescription or OTC drugs in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq.	States Found*
Antihistamine (5)	Chlorpheniramine	2	FL, KY
	Diphenhydramine	21	FL, IL, KY (2), LA, MD, NE, TN (13), TX
	Doxylamine	4	FL, KY (2), NE
	Hydroxyzine	5	KY, MD, OH (2), TN
	Promethazine	3	KY (2), TN
Antipsychotic (5)	Aripiprazole	2	TN (2)
	Chlorpromazine	1	KY
	Haloperidol	3	KY, MD, NE
	Olanzapine	4	KY, NE, TN (2)
	Quetiapine	1	FL
	Risperidone	1	MD
Anxiolytic (1)	Buspirone	1	MD
Barbiturate (1)	Butalbital	1	KY
Benzodiazepine (7)	7-amino Clonazepam**	7	IL, KY, LA, NE, TN (3)
	Alpha-hydroxy Alprazolam**	5	FL, TN (4)
	Alprazolam	9	FL (2), TN (7)
	Chlordiazepate	1	FL
	Clonazepam	3	IL, NE, TN
	Desalkylflurazepam	1	OH
	Diazepam	5	FL (2), KY, TN (2)
	Lorazepam	4	IL, KY (2), MD
	Midazolam	11	CA, KY (7), NM, OH, TN
	Nordiazepam**	7	FL (2), KY, MD, TN (3)
	Oxazepam**	5	FL (2), MD, TN, UT
	Temazepam**	4	FL, MD, TN, UT
Cardiovascular (8)	Amiodarone	1	KY
	Atorvastatin	1	NE
	Atropine	4	FL, OH, TN, TX
	Carvedilol	1	TN
	Clonidine	1	TN
	Labetalol	1	TN
	Lisinopril	1	TN
	Metoprolol	1	KY

**Compounds are expected metabolites of parent drugs, as follow:

Expected Metabolite	Parent Drug
7-Amino Clonazepam	Clonazepam
Alpha-Hydroxy Alprazolam	Alprazolam
Nordiazepam	Diazepam

Expected Metabolite	Parent Drug
Oxazepam	Diazepam
Temazepam	Diazepam

Table 3 (Continued). Prescription or OTC drugs in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq.	States Found*
Cough Suppressant (2)	Dextromethorphan	4	FL, KY (2), TN
	Dextrorphan	4	FL, KY (2), TN
Muscle Relaxant (3)	Baclofen	3	FL, NM, TX
	Cyclobenzaprine	4	CO, KY (2), MD
	Methocarbamol	3	KY, TN, UT
Opioid (3)	Buprenorphine	5	KY (2), ME, TN (2)
	EDDP**	6	MD, TN (4), TX
	Methadone	5	MD, TN (4)
	Naloxone	27	FL (8), KY (2), MD (3), NE (3), TN (11)
	Norbuprenorphine**	2	ME, TN
Pain Reliever (1)	Acetaminophen	30	FL (3), IL, KY (7), MD, ME, NE (5), NM, TN (8), TX, UT (2)

* CA – California; CO – Colorado; FL – Florida; IL – Illinois; KY – Kentucky; LA – Louisiana; MD – Maryland; ME – Maine; NE – Nebraska; NM – New Mexico; OH – Ohio; TN – Tennessee; TX – Texas; UT – Utah

**Compounds are expected metabolites of parent drugs, as follow:

Expected Metabolite	Parent Drug
EDDP	Methadone

Expected Metabolite	Parent Drug
Norbuprenorphine	Buprenorphine

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Dietary Supplement Stimulants

DEA TOX confirmed 4 detections of 3 DSS (Table 4) in biological samples in the third quarter of 2023. An additional NPS detection from a drug product is described in Table 6.

Table 4. DSS Detected in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq.	States Found*
Stimulant Alkaloid	Yohimbine	1	FL
Methyl Xanthine	Caffeine	2	AZ, NE
Phenethylamine	Hordenine	1	KY

*AZ – Arizona, FL – Florida, KY – Kentucky, NE – Nebraska

Precursors/Additives/Impurities

DEA TOX confirmed 96 detections of 6 P/A/I§ (Table 5) in biological samples in the third quarter of 2023.

Table 5. P/A/I Detected in Biological Samples – Third Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Adulterant (4)	Levamisole	7	FL (2), IL, NE (3), TX			0.3-13000	
	Phenacetin	1	NE			198	
	Quinine	21	KY, MD, NE, NM, OH (2), TN (15)	1.6-13.5	7.3-18.6	0.6-4130	436
	Xylazine	20	FL, MD, NE, TN (17)			0.6-116	
Impurity (1)	*N*,*N*-dimethyl amphetamine	11	FL, NE (4), TN (5), UT			0.2-22.3	88
Precursor (1)	4-ANPP	36	CA, FL (3), MD, NC, NE (9), TN (20), UT	1.9		0.3-24.2	17.1-369

*CA – California; FL – Florida; IL – Illinois; KY – Kentucky; MD – Maryland; ME – Maine; NE – Nebraska; NM – New Mexico; OH – Ohio; TN – Tennessee; TX – Texas; UT – Utah

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Drug Products

DEA TOX confirmed 7 detections of 6 drugs (Table 6) in 6 drug product samples analyzed in the third quarter of 2023.

Table 6. Drugs Detected in Drug Products – Third Quarter 2023

Drug Class	Drug Subclass	Drug	Freq.	States Found*	Level
New Psychoactive Substances	Cathinone (1)	N,N-Dimethylpentylone	1	FL	440ng
	Opioid (2)	Mitragynine	1	CA	140mg
		7-OH Mitragynine**	1	CA	1.2mg
		Tianeptine	1	VA	1.0g
Traditional Illicit Drugs	Cannabinoid (1)	Delta-9-THC	1	ME	2.2g
	Stimulant Alkaloid (1)	Nicotine	1	ME	370mg
Dietary Supplements and Stimulants	Alkaloid Stimulant (1)	Yohimbine	1	CA	640ug

*CA – California; FL – Florida; ME – Maine; VA – Virginia

**7-OH Mitragynine is an expected metabolite of Mitragynine.

Select Drug Product Exhibits:

Table 7. Drug Product Exhibit #1: Total Exhibit Weight: 39.8mg

Drug Class	Drug	State Found*	Confirmed Levels: µg of drug/gram of drug product	Actual Amount within Drug Product
NPS	N,N-Dimethylpentylone	FL	110 µg/g	440 ng

Table 8. Drug Product Exhibit #2: Total Exhibit Weight: 8.7629g (15 Pills, Including capsules)

Drug Class	Drug	State Found*	Confirmed Levels: ng of drug/gram of drug product	Actual Amount within Drug Product
NPS	Tianeptine	VA	120 mg/g	1.0 g

Table 9. Drug Product Exhibit #3: Total Exhibit Weight: 15.3888g

Drug Class	Drug	State Found*	Confirmed Levels: ng of drug/gram of drug product	Actual Amount within Drug Product
NPS	Mitragynine	CA	9.3 mg/g	140 mg
NPS	7-OH Mitragynine**		76.7µg/g	1.2 mg
DSS	Yohimbine		41.7µg/g	0.64 mg

**7-OH Mitragynine is an expected metabolite of Mitragynine.

Table 10. Drug Product Exhibit #4: Total Exhibit Weight: 7.9038g (Liquid Recovered from Device)

Drug Class	Drug	State Found*	Confirmed Levels: ng of drug/gram of drug product	Actual Amount within Drug Product
TID	Nicotine	ME	47 mg/g	370 mg

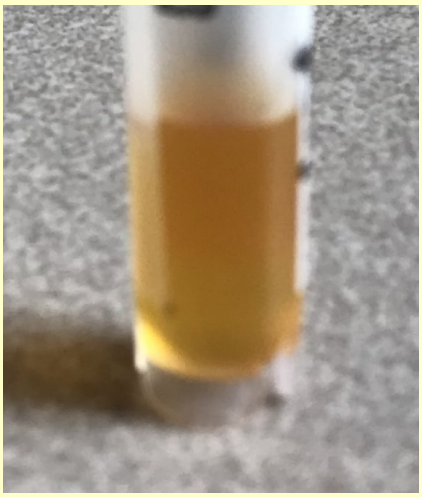
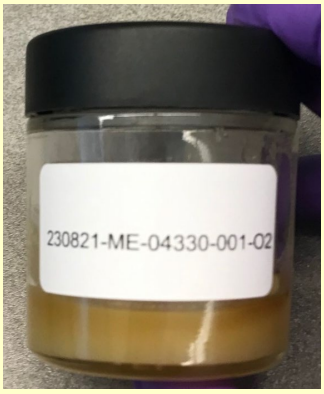


Table 11. Drug Product Exhibit #5: Total Exhibit Weight: 23.1847g (Paste Recovered from Jar)

Drug Class	Drug	State Found*	Confirmed Levels: ng of drug/gram of drug product	Actual Amount within Drug Product
TID	Delta-9-THC	ME	96 mg/g	2.2 g



*CA – California; FL – Florida; ME – Maine; TX – Texas; VA – Virginia

Contact Information

We invite medical and law enforcement facilities to contact our program if you encounter an overdose of a suspected synthetic drug and desire to have any leftover biological samples (blood preferred) analyzed further for such synthetic substances.

- **Sample Qualifications:**
  - Patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted).
- **How to Contact Us and Send Your Samples:**
  - Once the above qualifications are satisfied:
    - Email **DEATOX@DEA.GOV** with a brief description of the case (including initial toxicology screen and history) and a request for testing.
    - DEA will respond to each inquiry, and if approved, will send the instructions for packing and shipping of sample(s) to UCSF.
      - The main reason for disapproval of a case would be the identification of substances including methamphetamine, heroin, fentanyl, cocaine, LSD, PCP etc. in a routine toxicology screening at your facility.
      - This program's goal is to connect symptom causation to abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, fentanyl-related substances, other hallucinogens etc.).
  - Ensure that you de-identify and label the sample with a numerical value, sex, date of birth or age, and the date and time the sample was collected in accordance with the labeling instructions (sent with shipping instructions).
  - Keep a master list of the patients and the numerical values you allocated to each sample at your institution.
- **Cost of Sample Analysis:**
  - DEA will cover the full cost of testing the patient samples.
    - The sender will only be responsible for paying for packing and shipping samples to UCSF.
- **Turn-around Time:**
  - Results are expected within three to four weeks of receipt of the sample at UCSF except in rare occurrences when a novel substance is identified.

Public Domain Notice

Suggested citation:
U.S. Drug Enforcement Administration, Diversion Control Division (2023). DEA *TOX: Quarterly Report – Third Quarter 2023*. Springfield, VA.

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This report was produced in conjunction with the CTEB laboratory at UCSF.

Clinical Toxicology
and Environmental Biomonitoring Laboratory

DEA PRB-2023-28-3rdQtr