Supplementary Material:

Table S1. Classification of piperazines

Family	Compound
Benzyl piperazines	BZP(*N*-benzylpiperazine) 2C-B-BZP MDBP/MDBZP (1-(3,4-methylenedioxybenzyl)piperazine)- methylene-deoxy analogue of BZP, Piperonylpiperazine FBZP (1-(4-fluorobenzyl)-piperazine) MBZP (1-(4-methylbenzyl)-piperazine) DBZP (1,4-dibenzylpiperazina)
Phenyl piperazines	mCPP (1-(3-chlorophenyl)piperazine) pCPP 1-(4-Chlorophenyl)piperazine) mCPCPP (1-(3-Chlorophenyl)-4-(3-chloropropyl)piperazine) TFMPP (1-(3-trifluoromethylphenyl)piperazine) 1- TFMPP 2- TFMPP 3- TFMPP 4- TFMPP MePP (1-methyl-3-phenylpiperazine) MeBP (1-(3-methylbenzyl)piperazine) pMeOPP (1-(4- methoxyphenyl)piperazine) oMeOPP (1-(2-Methoxyphenyl)piperazine) pFPP (1-(4-fluorophenyl)-piperazine) DCPP (2,3-dichlorophenylpiperazine) mMPP (1-(3-Methylphenyl)piperazine) pMPP (1-(4-Methylphenyl)piperazine)

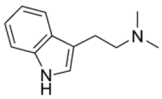
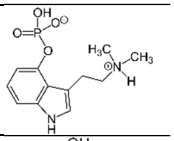
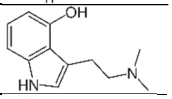
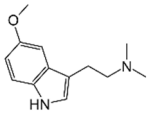
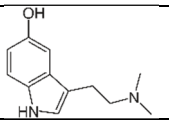
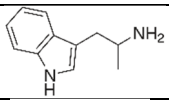
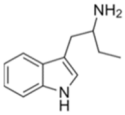
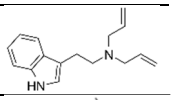
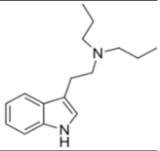
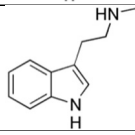
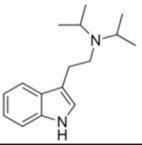
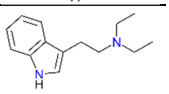
Table S2. Intoxications with piperazines.

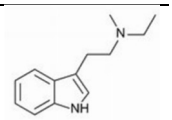
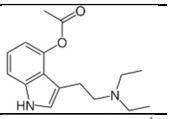
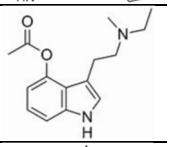
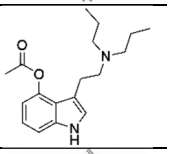
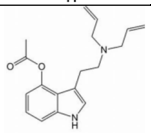
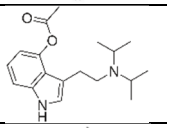
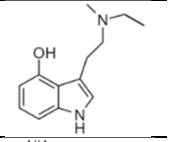
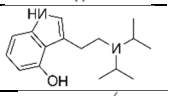
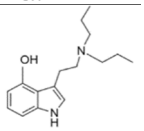
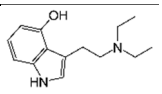
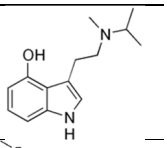
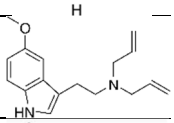
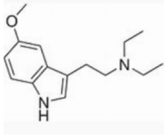
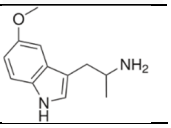
Age/sex	Quantity ingested	Compound detected in the toxicological screening	Sample	Reference
16, Female	4 tablets	BZP	n.a	[1]
17, Male	5 tablets	n.a	Serum, urine	[2]
18, Female	n.a	BZP	n.a	[1]
18, Female	4 tablets	BZP (260–270 ng/mL), TFMPP (30–60 ng/mL)	Serum	[3]
18, Female	4 tablets			
19, Male	4 tablets			
19, Female	n.a	BZP (0.20 mg/L) and metabolites	Plasma, urine, blood	[4]
20, Male	3 – 4 tablets	BZP	Blood	[5]
22, Male	3 – 4 tablets	BZP (2.23 mg/L), MDMA (1.05 mg/L)	Plasma	[4]
23, Female	n.a	BZP	Serum, plasma	[6]
25, Male	4 tablets	BZP	n.a	[1]
29, Female	3 tablets	mCPP (320 ng/mL)	Plasma	[7]
		mCPP (2300 ng/mL)	Urine	
88 patients, 15 – 42 years	aproximately 3.89 tablets	BZP	Plasma	[8]
7 patients, 18 – 23 years	3 – 9 tablets	BZP (1.3, 1.9, 1.9, and 2.5 mg/L)	Serum	[9]

n.a.: not available

Table S3. Examples of natural and synthetic tryptamines

TRYPTAMINES

Commum Name	Abbreviation	Molecular formula	Chemical Structure
Natural Origin Tryptamines			
Dimethyltryptamine	DMT	$C_{12}H_{16}N_2$	
Psilocybin		$C_{12}H_{17}N_2O_4P$	
Psilocin	4-OH-DMT	$C_{12}H_{16}N_2O$	
5-Methoxy-*N*,*N*-dimethyltryptamine	5-MeO-DMT	$C_{13}H_{18}N_2O$	
5-Hydroxy-*N*,*N*-dimethyltryptamine	Bufotenine	$C_{12}H_{16}N_2O$	
Tryptamines of Synthetic Origin			
α-methyltryptamine	α-MT	$C_{11}H_{14}N_2$	
α-ethyltryptamine	α -ET	$C_{12}H_{16}N_2$	
N,*N*-diallyltryptamine	DALT	$C_{16}H_{19}N_2$	
Dipropyltryptamine	DPT	$C_{16}H_{24}N_2$	
N-methyltryptamine	NMT	$C_{11}H_{14}N_2$	
Diisopropyltryptamine	DiPT	$C_{16}H_{24}N_2$	
Diethyltryptamine	DETECTIVE	$C_{14}H_{20}N_2$	

N-methyl-*N* ethyltryptamine	MET	$C_{13}H_{18}N_2$	
4-acetoxy-*N*,*N*-diethiltryptamine	4-AcO-DET	$C_{16}H_{22}N_2O_2$	
4-Acetoxy-*N*-methyl-*N*-ethyltryptamine	4-AcO-MET	$C_{15}H_{20}N_2O_2$	
4-Acetoxy-*N*,*N*-dipropyltryptamine	4-AcO-DPT	$C_{18}H_{26}N_2O_2$	
4-Acetyloxy-*N*,*N*-diallyltryptamine	4-AcO-DALT	$C_{18}H_{22}N_2O_2$	
4- acetoxi-*N*,*N*-diisopropyltryptamine	4-AcO-DiPT	$C_{18}H_{26}N_2O_2$	
4-Hydroxy-*N*-methyl-*N*-ethyltryptamine	4-OH-MET	$C_{13}H_{18}N_2O$	
4-hydroxy-*N*,*N*-diisopropyltryptamine	4-OH-DiPT	$C_{16}H_{24}N_2O$	
4-Hydroxy-*N*,*N*-dipropyltryptamine	4-OH-DPT	$C_{16}H_{24}N_2O$	
4-hydroxy-*N*,*N*-diethyltryptamine	4-OH-DET	$C_{14}H_{20}N_2O$	
4-hydroxy-*N*-methyl-*N*-isopiltryptaline	4-OH-MiPT	$C_{14}H_{20}N_2O$	
5-Methoxy-*N*,*N*-diallyltryptamine	5-MeO-DALT	$C_{17}H_{22}N_2O$	
5-Methoxy-*N*,*N*-diethyltryptamine	5-MeO-DET	$C_{15}H_{22}N_2O$	
5-Methoxy-α-methyltryptamine	5-MeO-α-MT	$C_{12}H_{16}N_2O$	

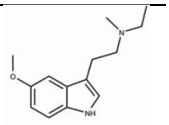
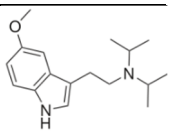
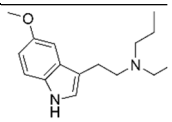
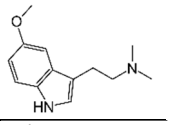
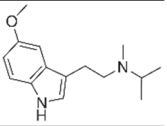
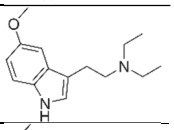
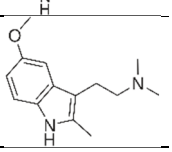
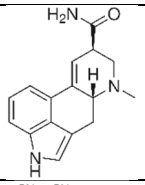
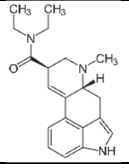
5-Methoxy-*N*-methyl-*N*-ethyltryptamine	5-MeO-MET	$C_{14}H_{20}N_2O$	
5-Methoxy-*N*,*N*-diisopropyltryptamine	5-MeO-DiPT "Foxy Methoxy"	$C_{17}H_{26}N_2O$	
5-Methoxy-*N*,*N*-dipropyltryptamine	5-MeO-DPT	$C_{17}H_{26}N_2O$	
5-methoxy-*N*,*N*-dimethiltryptamine	5-MeO-DMT	$C_{13}H_{18}N_2O$	
5-methoxy-*N*-methyl-*N*-isopiltryptaline	5-MeO-MiPT "Moxy"	$C_{15}H_{22}N_2O$	
5-Methoxy-*N*,*N*-diethyltryptamine	5-MeO-DET	$C_{15}H_{22}N_2$	
5-Methoxy-*N*,*N*-trimethyltryptamine	5-MeO-TMT	$C_{14}H_{20}N_2O$	
	Ergolines		
(8β)-9,10-Didehydro-6-methyl-ergoline-8-carboxamide	LSA	$C_{16}H_{17}N_3O$	
9,10-didehydro-*N*,*N*-diethyl-6-methylergoline-8β-carboxamide	LSD	$C_{20}H_{25}N_3O$	

Table S4. Classes of SCRA and their chemical characterization

Category	Structure	Examples of compounds
Classical cannabinoids	Similar to THC	HU-210; HU211; AM-906; AM-411
Non-classical cannabinoids	Cyclohexylphenols	CP compounds: CP-47,497 and analogues;
Hybrid cannabinoids	Share similarities with classical and non-classical cannabinoids	AM-4030
Aminoalkylindoles	Assimilar to THC	WIN 55,212-2; AM-1241, UR-144, 5F-APICA; compounds of the JWH family
Eicosanoids	Structures analogous to endocannabinoids	methanandamide
Others	Other structures; Diapyrazoles, naphtaylpyrroles and naphthylmethylindenes	SR141716A; SR144528

Table S5. Phencyclidine-type substances

Abbreviation (common name)	**Chemical name**
Ketamine	2-(2-Chlorophenyl)-2-(methylamino)cyclohexan-1-one
PCA	1-Phenylcyclohexan-1-amine
PCP (phencyclidine)	1-(1-phencyclohexyl) piperidine
PCE (eticyclidine)	*N*-ethyl-1-phenylcyclohexylamine
PCPr	*N*-Propyl-1-phenylcyclohexylamine
PCiP	1-Phenyl-*N*-(propan-2-yl)cyclohexan-1-amine
PCPy, PHP (rolicyclidine)	1-(1-phenylcyclohexyl) pyrrolidine
PCMo	1-(1-Phenylcyclohexyl)morpholine
TCP (tenocyclidine)	1-[1-(thiophen-2-yl)cyclohexyl]piperidine
TCPy	1-[1-(Thiophen-2-yl)cyclohexyl]pyrrolidine
2-MeO-PCP	2-methoxy-phencyclidine
3-OH-PCP (3-hydroxyphencyclidine	3-[1-(Piperidin-1-yl)cyclohexyl]phenol
3-OH-PCE	3-[1-(Ethylamino)cyclohexyl]phenol
3-MeO-PCE (methoxieticyclidine)	2-(3-methoxyphenyl)-2-(ethylamino)cyclohexane
3-MeO-PCP (3-methoxyphencyclidine)	1-[1-(3-methoxyphenyl)cyclohexyl]piperidine
3-MeO-PCPy (3-methoxyrolicyclidine)	1-[1-(3-Methoxyphenyl)cyclohexyl]-pyrrolidine
3-MeO-PCPr	2-(3-Methoxyphenyl)-2-(propylamino)cyclohexane
4-Me-PCP	1-[1-(4-Methylphenyl)cyclohexyl]piperidine
4′-Me-PCP	4-Methyl-1-(1-phenylcyclohexyl)piperidine
4-MeO-PCP (methoxydine)	1-[1-(4-methoxyphenyl)cyclohexyl]piperidine
5-MeO-PCP (5-methophencyclidine)	1-[1-(5-methoxyphenyl)cyclohexyl]piperidine
MXE (methoxetamine)	2-(3-Methoxyphenyl)-2-(ethylamino)cyclohexan- 1-one

Table S6. Case report intoxications with phencyclidine-type substances**.**

Age/sex	Via of administration	Case report	Detected compound	Quantity	Symptoms	Reference
126 patients, median age of 22 years	>50% nasally and oral	Non-fatal	Mostly just Ketamine, but in other cases co-ingested alcohol (10.3 %), ecstasy (6.4 %), and methamphetamine (6.0 %).	Not mentioned	The most common symptoms were hypertension and tachycardia. Other symptoms were nausea or vomiting, dysuria, abdominal tenderness, abnormal LFTs, dilatation of the CBD, cystitis, chronic abdominal pain and psychiatric concerns.	[10]
17, male	Nasally	Non-fatal	MXE	Not mentioned	Reduced level of consciousness, severe truncal ataxia, dysarthria, dysdiadochokinesis, incoordination and horizontal nystagmus.	[11]
45, male	Oral	Non-fatal	4-MeO-PCP and ethanol	Not mentioned	Disorientation, hypersalivation, tremors and occasional myoclonic jerks, scanning speech with dysarthria, and nystagmus in all directions of lateral gaze	[12]
54, male	Oral	Fatal	4-MeO-PCP and 4-HO-MET	Blood- 8,200 ng/mL Urine-140 mg/L Gastric contents-280 mg	Not mencioned	[12]
17, male	1º time: Oral 200 mg 2º time: Nasally 50mg	Non-fatal	3-MeO-PCP	1º time: Blood-71.1 ng/mL Urine-706 ng/L 2ºtime: Not mentioned	Hypertension, tachycardia and neurological manifestations such as confusion, hypertonia, nystagmus and agitation	[13]
29, male	Not mencioned	Fatal	3-MeO-PCP	139 ng/mL of 3-MeO-PCP, with 4.1 mg/L of	Congested lungs and distended bladder	[12]

		diphenhydramine and 100 ng/mL of amphetamine

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1. Gee, P.; Richardson, S.; Woltersdorf, W.; Moore, G. Toxic effects of BZP-based herbal party pills in humans: A prospective study in Christchurch, New Zealand. *N. Z. Med. J.* **2005**, *118*, 1–10.
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