

AT-A-GLANCE: NEW PSYCHOACTIVE SUBSTANCES IN CANADA - 2022

HEALTH CANADA
DRUG ANALYSIS SERVICE

PUBLIC HEALTH AGENCY OF CANADA

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Health Canada's Drug Analysis Service (DAS) operates laboratories across Canada that analyze suspected illicit drugs seized by Canadian law enforcement agencies and samples submitted by public health partners. DAS data is solely based on samples submitted to our laboratories and as such, samples analyzed by DAS may not be completely representative of drug seizure in Canada, including substances circulating on the market. DAS data should therefore be used with caution when determining trends or drawing conclusions about the type and nature of substances circulating in the illicit market. The data below represent the number of times a substance was identified in submitted samples. A single sample may contain more than one substance. Categorization of substances is based on the [Controlled Drugs and Substances Act \(CDSA\)](#).

New Psychoactive Substances in Canada 2022

SUMMARY

- The Drug Analysis Service identified 29 new psychoactive substances (NPS) in 2022.
- In total, there were 8 hallucinogens, 7 sedative/hypnotics, 5 stimulants, 4 cannabinoids, 2 dissociatives, 2 opioids and 1 other substance.
- 14 NPS were identified in samples submitted by law enforcement agencies from Ontario, 8 from British Columbia, 3 from Alberta, 3 from Quebec and 1 from Saskatchewan. No NPS were initially identified in the other provinces and territories.
- In 2022, the benzodiazepine Desalkylgidazepam emerged as the most commonly identified NPS.

AIM

The aim of this report is to describe NPS that emerged in Canada in 2022 based on samples submitted to the Drug Analysis Service (DAS) by law enforcement agencies and public health partners.

NEW PSYCHOACTIVE SUBSTANCE – DEFINITION

For the purpose of this report, a new psychoactive substance (NPS) is defined as a substance that has the potential to induce psychoactive effects and that has been identified in Canada for the first time in sample submitted to DAS for analysis by law enforcement agencies and public health partners. These substances may be dangerous compounds. It is important to note that these substances may not be regulated or controlled in Canada and comprehensive information regarding their toxicity may not always be readily accessible, thereby posing potential risks to the Canadian population and more specifically people who use drugs.

DATA LIMITATIONS

This report is based on data made available by the Drug Analysis Service (DAS), which analyses suspected illicit drugs seized by Canadian law enforcement agencies and samples submitted by public health partners. Some limitations govern the present data. First, law enforcement agencies submit samples for laboratory analysis based on investigation needs and orientations. Thus, analyzed samples may not be completely representative of substances circulating on the market as a number of factors may influence substances submitted by Canadian law enforcement agencies. Additionally, DAS' mandate is to report substances that are controlled under the Controlled Drugs and Substances Act. As such, it is possible that not all noncontrolled substance were reported.

DATA ANALYSIS

Results of analyzed samples submitted by Canadian law enforcement agencies and public health partners are reported in a centralized database called the Laboratory Information Management System (LIMS). The presented data were retrieved from the LIMS and covers the period between January 1, 2022 and December 31, 2022, inclusively. NPS identifications are defined as the identification of a substance in a unique sample.

The analysis of presented data was performed in R4.0.2. Data wrangling and visualization was performed using the tidyverse package [1].

NEW PSYCHOACTIVE SUBSTANCES IN CANADA IN 2022

- Between January 1st, 2022 and December 31st, 2022, the Drug Analysis Service identified 29 new psychoactive substances (NPS) in samples submitted by Canadian law enforcement agencies, including 4 cannabinoids, 2 dissociatives, 2 opioids, 8 hallucinogens, 7 sedatives/hypnotics and 5 stimulants (Table 1).
- Of the 29 NPS, 19 of them are controlled under the *Controlled Drugs and Substances Act (CDSA)* and one (Medetomidine) is regulated under the *Food and Drugs Act and Regulations* and is currently approved in Canada for veterinary use only (Table 2).

Table 1. Number of new psychoactive substances by class (2022)

Pharmacological Class	Chemical Class	Count (n)	Percent (%)
Cannabinoid	Cannabimimetics Class	4	13.8
Dissociative	Ketamine Class	2	6.9
Hallucinogen	Lysergic Acid (LSD) Class	2	6.9
	Phenethylamines (Main) Class	2	6.9
	Tryptamine Class	4	13.8
	<i>Total</i>	8	27.6
Opioid	Opioid Class (Non-Fentanyl, Non-Opiates)	2	6.9
Sedative/Hypnotic	Benzodiazepine (BZD) Class	4	13.8
	Quinazolinone (Quaalude) Class	2	6.9
	Cutting Agent	1	3.4
	<i>Total</i>	7	24.1
Stimulant	Amphetamine / Methamphetamine (Sub) Class	1	3.4
	Cathinone (Sub) Class	4	13.8
	<i>Total</i>	5	17.2
Other Substances	Precursor / Key Intermediate / Reagent	1	3.4
Grand Total	-	29	100.0

Table 2. New psychoactive substances in Canada (2022)

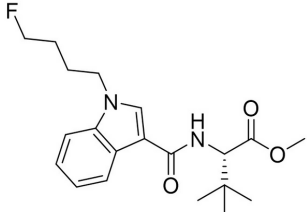
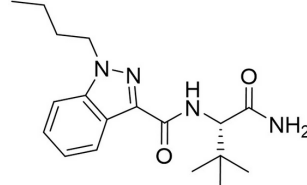
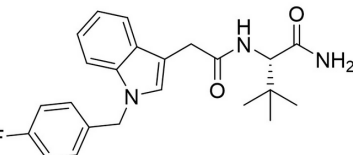
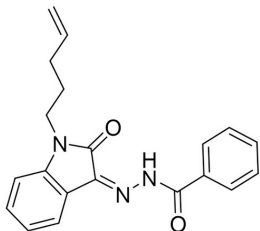
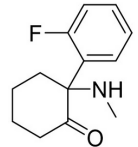
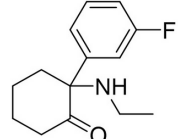
Pharmacological Class, Chemical Class	Substance	Synonym(s)	Controlled status	Additional information	Structure
Cannabinoid, Cannabimimetics Class	4-fluoro-MDMB-BICA	4-fluoro MDMB-BUTICA	<i>CDSA</i> : Schedule II, Item 2	Synthetic cannabinoids exhibit effects that are similar to delta-9-tetrahydrocannabinol (THC), the active component of cannabis, but they have the potential to induce more potent effects than THC [2].	
	ADB-BUTINACA	-	<i>CDSA</i> : Schedule II, Item 2	Synthetic cannabinoids have been associated with adverse effects, including psychosis, hallucinations, and even fatalities [3][4].	
	ADB-FUBIATA	AD-18; FUB-ACADB	<i>CDSA</i> : Schedule II, Item 2	This synthetic cannabinoid was initially developed in 2008 with the intention of targeting specific (non-psychoactive) therapeutic effects in the pursuit of new treatments for neuropathic pain [5].	
	BZO-4en-POXIZID	4en-pentyl MDA-19	<i>CDSA</i> : Schedule II, Item 2		
Dissociative, Ketamine Class	Fluorodeschloroketamine [†]	2-FDCK; 3-FDCK; 4-FDCK	<i>CDSA</i> : Schedule I, Item 14, Line 1	There is limited information available in the literature regarding these Ketamine analogs. It is anticipated that these substances will exhibit dissociative effects similar to Ketamine [6][7].	
	Fluorexetamine ^β	3-fluoro-2-OXO-PCE; FXE; 2-fluoro-2-OXO-PCE	<i>CDSA</i> : Schedule I, Item 14, Line 1		

Table 2. New psychoactive substances in Canada (2022)

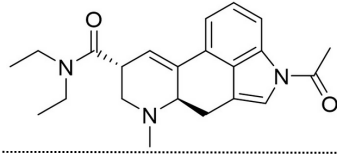
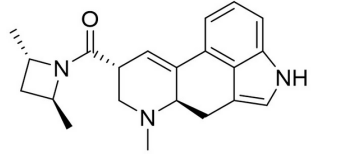
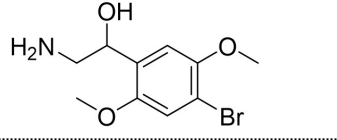
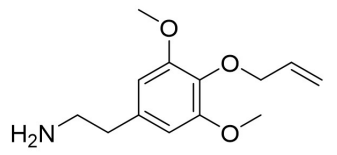
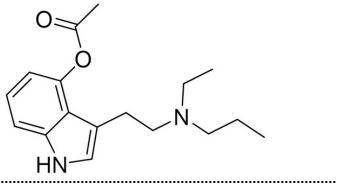
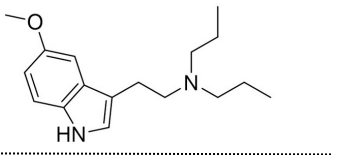
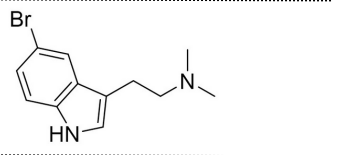
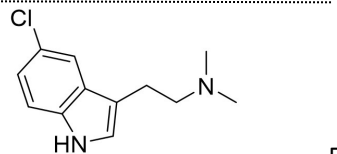
Pharmacological Class, Chemical Class	Substance	Synonym(s)	Controlled status	Additional information	Structure
Hallucinogen, Lysergic Acid (LSD) Class	1-Acetyl LSD	ALD52	Not controlled	These substances are analogues of Lysergic acid diethylamide (LSD) that generates psychedelic effects, resembling those of LSD [8][9].	
	2,4-Dimethylazetidide LSD	LSZ	Not controlled		
Hallucinogen, Phenethylamines (Main) Class	β -hydroxy 2C-B	BOHB; BOH-2C-B	CDSA: Schedule III, Item 35	There is little information available in the literature regarding this substance.	
	Allylescaline	-	Not controlled	This substance is a derivative of the phenethylamine Mescaline. There is little information available in the literature regarding this substance. [10]	
Hallucinogen, Tryptamine Class	4-Acetoxy-N-Ethyl-N-Propyltryptamine	4-Acetoxy EPT	Not controlled	Data suggest that this tryptamine may possibly have similar effects as psilocybin [11].	
	5-methoxy DPT	5-methoxy-N,N-Dipropyltryptamine; 5-MeO-DPT	Not controlled	There is little information available in the literature regarding these tryptamines.	
	Bromo-N,N-Dimethyltryptamine †	4-bromo-DMT; 5-bromo-DMT; 6-bromo-DMT; 7-bromo-DMT	Not controlled		
	Chloro-N,N-Dimethyltryptamine †	4-chloro-DMT; 5-chloro-DMT ; 6-chloro-DMT; 7-chloro-DMT	Not controlled		

Table 2. New psychoactive substances in Canada (2022)

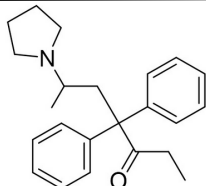
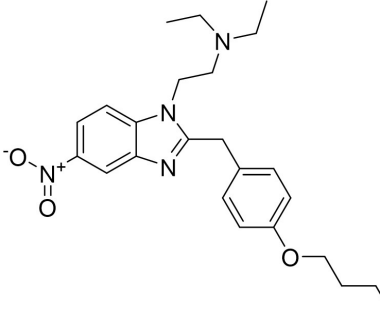
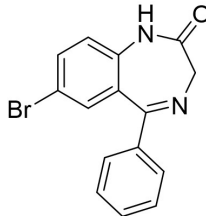
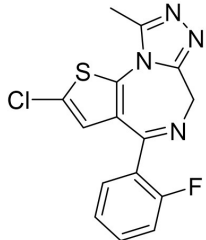
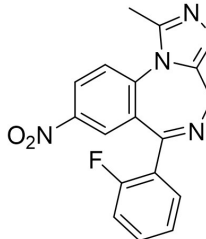
Pharmacological Class, Chemical Class	Substance	Synonym(s)	Controlled status	Additional information	Structure
Opioid, Opioid Class (Non-Fentanyl, Non-Opiates)	Dipyanone	N-pyrrolidino Methadone	CDSA: Schedule I, Item 5	This opioid is reported to be slightly less potent than methadone [12].	
	Butonitazene	Butoxynitazene	CDSA: Schedule I, Item 13	This novel opioid is reported to exhibit analgesic effects in mice, in a manner consistent with other benzimidazoles [13].	
Sedative/Hypnotic, Benzodiazepine (BZD) Class	Desalkylgidazepam	Bromonordiazepam	CDSA: Schedule IV, Item 18	The active metabolite of Gidazepam, an available prescription-only benzodiazepine medication marketed in Russia and Ukraine. It is utilized as a treatment for anxiety, alcohol withdrawal, and migraines. [14]	
	Fluclotizolam	-	CDSA: Schedule IV, Item 18	Data suggest that this benzodiazepine may be 2-3 times more potent than Etizolam [15].	
	Flunitrazolam	FNTZ; Flunazolam	CDSA: Schedule IV, Item 18	The chemical structure suggests that Flunitrazolam is a potent benzodiazepine [15].	

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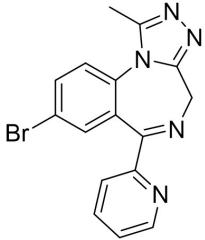
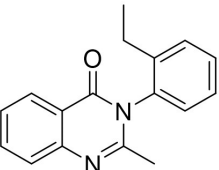
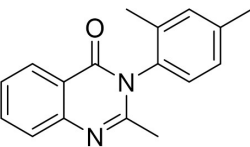
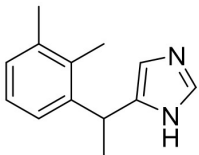
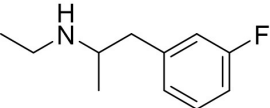
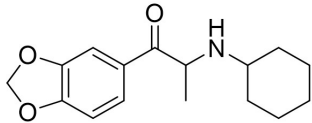
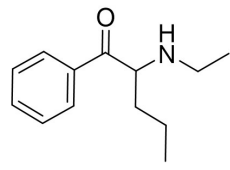
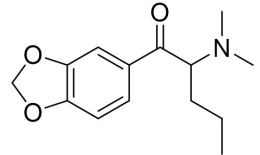
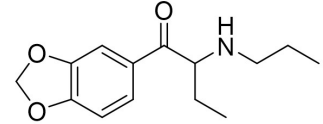
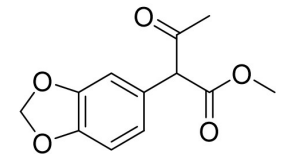
Pharmacological Class, Chemical Class	Substance	Synonym(s)	Controlled status	Additional information	Structure
Sedative/Hypnotic, Benzodiazepine (BZD) Class	Pyrazolam	-	CDSA: Schedule IV, Item 18	This benzodiazepine is structurally similar to Alprazolam. It has been identified in Europe in 2012 [15].	
Sedative/Hypnotic, Quinazolinone (Quaalude) Class	Etaqualone	Aolan; Athinazone; Ethinazone	Not controlled	This quinazolinone is an analogue of Methaqualone and was marketed in Europe for the treatment of insomnia [16].	
	Methylmethaqualone	MMQ; 4-methyl Methaqualone	Not controlled	This quinazolinone is an analogue of Methaqualone. It has been associated with acute neurotoxicity [17].	
Sedative/Hypnotic, Cutting Agent	Medetomidine	Domitor; Selektope	<i>Canada's Food and Drugs Act and Regulations (Veterinary use only)</i>	This substance is an analgesic/anesthetic belonging to the same class of medication as Xylazine. It is commonly employed in veterinary medicine as an adjuvant analgesic/anesthetic during surgeries for dogs [18].	
Stimulant, Amphetamine / Methamphetamine (Sub) Class	Fluoroethamphetamine ^β	2-fluoroethamphetamine; 3-fluoroethamphetamine; 4-fluoroethamphetamine	CDSA: Schedule I, Item 19	This amphetamine is structurally similar to fluoroamphetamine and fluoromethamphetamine [19].	

Table 2. New psychoactive substances in Canada (2022)

Pharmacological Class, Chemical Class	Substance	Synonym(s)	Controlled status	Additional information	Structure
	N-cyclohexylmethydone	Cyputylone	CDSA: Schedule I, Item 19	This cathinone is structurally similar to Methydone and Diethylone. Little information is available [20].	
Stimulant, Cathinone (Sub) Class	N-Ethylpentedrone	α-Ethylaminopentiophenone	CDSA: Schedule I, Item 19	These cathinones have been identified in several toxicology and death cases [21][22][23].	
	N,N-Dimethylpentylone	Dipentylone; bk-DMBDP	CDSA: Schedule I, Item 19		
	N-Propylbutylone	3,4-Methylenedioxy-α-propylaminobutiophenone; bk-PBDB	CDSA: Schedule I, Item 19		
Other substance, Precursor / Key Intermediate / Reagent	Methyl 3-oxo-2-(3,4-methylenedioxyphenyl)butanoate	MD-MAPA; 3,4-methylenedioxy-MAPA	CDSA: Schedule VI, Item 9	This substance serves as a precursor in the production of MDMA [24].	

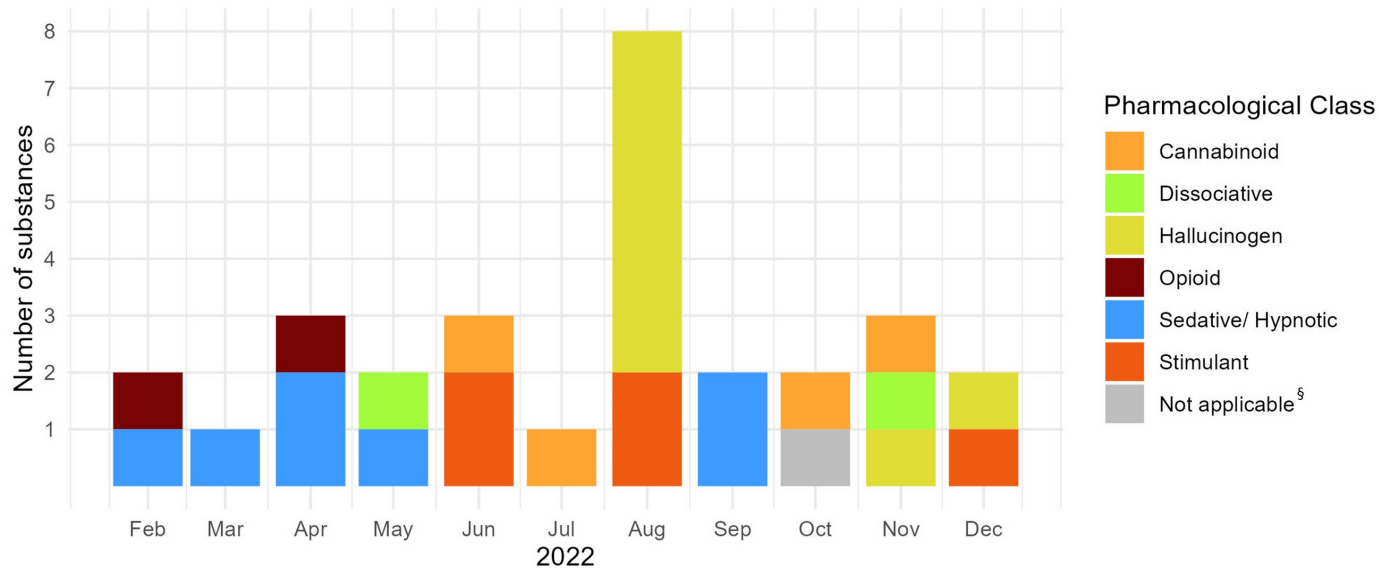
‡ There is multiple isomers available for this drug and only the 2-substituted isomer have been drawn in this table.

β There is multiple isomers available for this drug and only the 3-substituted isomer have been drawn in this table.

¥ There is multiple isomers available for this drug and only the 5-substituted isomer have been drawn in this table.

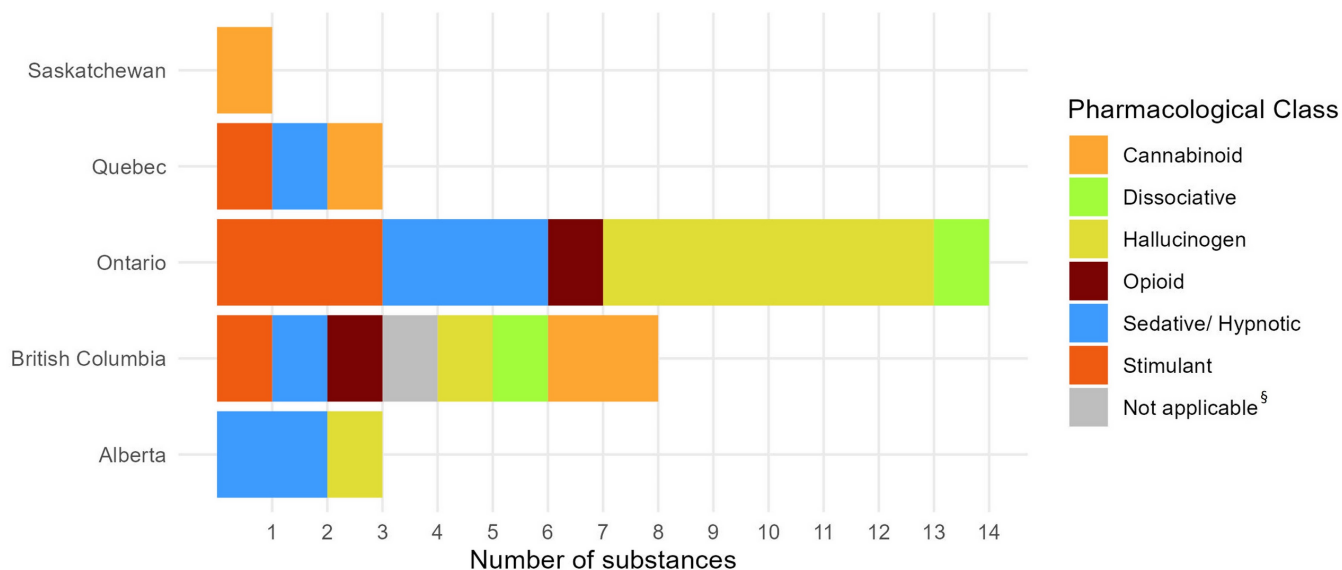
FIRST IDENTIFICATIONS

- New psychoactive substances were identified throughout 2022, reaching a peak in August (Figure 1).
- Half (14) of the 29 NPS were first identified in samples submitted by law enforcement agencies in Ontario, and a quarter (8) of them were identified in samples submitted by law enforcement agencies in British Columbia (Figure 2).



Data source: Health Canada, Drug Analysis Service

Figure 1. First NPS identification (month) in 2022 by pharmacological class



Data source: Health Canada, Drug Analysis Service

Figure 2. Number of the first NPS identifications in 2022 per province and territory

[§] Not applicable: Includes precursors/key intermediates/reagents, prescription drugs, over the counter drugs and non-drugs.

FIRST IDENTIFICATIONS (CONTINUED)

- **Cannabinoids:** DAS newly identified 4 synthetic cannabinoids (cannabimimetics) in 2022, all of which were either in powder form or residue. 4-fluoro-MDMB-BICA was found in co-occurrence with another synthetic cannabinoid, ADB-BUTINACA. Other co-occurring substances identified with some of these NPS were opioids (Fentanyl, nitazenes), stimulants (Cocaine, Methamphetamine) and Xylazine (Table 3).
- **Dissociatives:** DAS newly identified 2 ketamine analogues in 2022, both of which were in crystalline form. Fluorodeschloroketamine was identified both in crystalline form and in powder form. It was also identified in co-occurrence with various substances including stimulants (Cocaine, Methamphetamine, and MDA), opioids (Fentanyl, Carfentanil, and 6-Acetylmorphine), and Ketamine itself (Table 3).

Table 3. First identification of new psychoactive substances (2022)

Pharmacological Class	Chemical Class	Substance	First identification		Description	Co-occurring substances
			Date	City, Province		
Cannabinoid	Cannabimimetics Class	4-fluoro-MDMB-BICA	October 27, 2022	Nanaimo, British Columbia	Powder	ADB-BUTINACA
		ADB-BUTINACA	July 27, 2022	Regina, Saskatchewan	Powder	Caffeine, β -keto-Ethylbenzodioxolylbutanamine, Xylazine
		ADB-FUBIATA	June 28, 2022	Vancouver, British Columbia	Powder	α -Pyrrolidinoisohexanophenone, Caffeine, Cocaine, Diphenhydramine, Etodesnitazene, Fentanyl, Metonitazene
		BZO-4en-POXIZID	November 8, 2022	Lavaltrie, Quebec	Residue	Caffeine, Fentanyl, Methamphetamine, Xylazine
Dissociative	Ketamine Class	Fluorexetamine	November 22, 2022	Surrey, British Columbia	Crystalline substance	-
		Fluorodeschloroketamine	May 25, 2022	Port Hope, Ontario	Crystalline substance, Powder	Caffeine, Cocaine, Diphenhydramine, Fentanyl, 3,4-methylenedioxyamphetamine (MDA), Methamphetamine, 6-Acetylmorphine, Carfentanil, Ketamine

FIRST IDENTIFICATIONS (CONTINUED)

- **Hallucinogens:** DAS newly identified 4 tryptamines in 2022, all of which were in powder form and without any co-occurring substances (Table 3).
- **Opioids :** DAS newly identified 2 synthetic opioids in 2022 , both of which were in powder form. Dipyanone was found in co-occurrence with substances such as Fentanyl and Etizolam, among others. Butonitazene was found in co-occurrence with other opioids (Metonitazene, Fentanyl and Acetylfentanyl) and sedative/hypnotic substances (Xylazine and Flubromazepam) (Table 3).

Table 3. First identification of new psychoactive substances (2022) (Continued)

Pharmacological Class	Chemical Class	Substance	First identification		Description	Co-occurring substances
			Date	City, Province		
Hallucinogen	Lysergic acid (LSD) class	1-Acetyl LSD	August 26, 2022	Hamilton, Ontario	Powder	-
		2,4-Dimethylazetidide LSD	August 19, 2022	Hamilton, Ontario	Blotter papers	-
	Phenethylamines (main) class	Allylescaline	August 26, 2022	Hamilton, Ontario	Powder	-
		β-hydroxy 2C-B	December 13, 2022	Lethbridge, Alberta	Tablets	-
	Tryptamine class	4-Acetoxy-N-Ethyl-N-Propyltryptamine	August 12, 2022	Hamilton, Ontario	Powder	-
		5-methoxy DPT	November 14, 2022	Nanaimo, British Columbia	Powder	-
		Bromo-N,N-Dimethyltryptamine	August 26, 2022	Hamilton, Ontario	Powder	-
		Chloro-N,N-Dimethyltryptamine	August 19, 2022	Hamilton, Ontario	Powder	-
Opioid	Opioid class (non-fentanyl, non-opiates)	Dipyanone	February 22, 2022	Brantford, Ontario	Powder	Caffeine, Diphenhydramine, Etizolam, Fentanyl, Lidocaine, Phenacetin
		Butonitazene	April 27, 2022	Surrey, British Columbia	Powder	Caffeine, Dimethylsulphone, Fentanyl, Flubromazepam, Xylazine, Acetylfentanyl, Metonitazene

FIRST IDENTIFICATIONS (CONTINUED)

- **Sedatives/hypnotics** : DAS newly identified 4 benzodiazepines in 2022. Desalkylgidazepam and Fluclozepam were repeatedly identified in 2022 in various forms including tablets, powder, blotter paper and crystalline substance. Flunitrazolam and Pyrazolam were each identified once in 2022 in the form of tablets. Desalkylgidazepam was identified in co-occurrence with multiple other substances, including Fentanyl and analogues, other benzodiazepines, nitazenes as well as stimulants (Methamphetamine, Cocaine and MDMA). More information about Desalkylgidazepam can be found in our report "[Infosheet: Emergence of Desalkylgidazepam, a novel benzodiazepine in Canada](#)" (Table 3).

Table 3. First identification of new psychoactive substances (2022) (Continued)

Pharmacological Class	Chemical Class	Substance	First identification		Description	Co-occurring substances
			Date	City, Province		
Sedative/Hypnotic	Benzodiazepine (BZD) Class	Desalkylgidazepam	April 27, 2022	Drayton Valley, Alberta	Powder, Crystalline substance, Residue, Rock-like solid (crack), Syringe	Fentanyl, Methamphetamine, Caffeine, Phenacetin, para-Fluorofentanyl, Carfentanil, Dimethylsulphone, Flualprazolam, Cocaine, Lidocaine, Flubromazepam, Acetylfentanyl, Bromazolam, Diacetylmorphine, Xylazine, Etizolam, N-methyl-3,4-methylenedioxyamphetamine (MDMA), Deschloroetizolam, Diphenhydramine, Etodesnitazene, Metonitazene, Trazodone
		Fluclozepam	April 21, 2022	Dryden, Ontario	Tablets, Blotter papers, Powder	-
		Flunitrazolam	September 13, 2022	Longueuil, Quebec	Tablets	-
		Pyrazolam	September 29, 2022	Lethbridge, Alberta	Tablets	-

FIRST IDENTIFICATIONS (CONTINUED)

- **Sedatives/hypnotics** : DAS also newly identified 2 sedatives/hypnotics belonging to the quinazolinone (quaalude) chemical class. These substances, Etaqualone and Methylnmethaqualone, were found in powder form and were identified in co-occurrence with Fentanyl, various benzodiazepines, and nitazenes. At last, Medetomidine, a non-controlled veterinary anesthetic/analgesic was identified in co-occurrence with Fentanyl, several benzodiazepines as well as Xylazine (Table 3).
- **Stimulants**: DAS newly identified 4 cathinones in 2022. N,N-Dimethylpentylone was identified in co-occurrence with Methamphetamine, Fentanyl and Xylazine (Table 3).

Table 3. First identification of new psychoactive substances (2022) (Continued)

Pharmacological Class	Chemical Class	Substance	First identification		Description	Co-occurring substances
			Date	City, Province		
Sedative/Hypnotic	Quinazolinone (Quaalude) Class	Etaqualone	March 23, 2022	Barrie, Ontario	Powder	Bromazolam, Caffeine, Diphenhydramine, Etodesnitazene, Fentanyl, Metonitazene, Scopolamine
		Methylnmethaqualone	February 25, 2022	Barrie, Ontario	Powder	Caffeine, Diphenhydramine, Etodesnitazene, Fentanyl, Metonitazene, Norfludiazepam, Bromazolam, Furanyl UF-17, Xylazine, Dimethylsulphone
	Cutting Agent	Medetomidine	May 11, 2022	Brantford, Ontario	Powder	Caffeine, Diphenhydramine, Fentanyl, Flubromazepam, Phenacetin, Xylazine, Etodesnitazene, Bromazolam, Etizolam, Norfludiazepam
Stimulant	Amphetamine / methamphetamine (sub) class	Fluoroethamphetamine	June 9, 2022	Port Hope, Ontario	Powder	-
	Cathinone (sub) class	N,N-Dimethylpentylone	June 1, 2022	Barrie, Ontario	Powder Tablets	α -Pyrrolidinoisohexanophenone, Caffeine, Methamphetamine, Fentanyl, Xylazine, Dimethylsulphone

Table 3. First identification of new psychoactive substances (2022) (Continued)

Pharmacological Class	Chemical Class	Substance	First identification		Description	Co-occurring substances
			Date	City, Province		
Stimulant	Cathinone (sub) class	N-cyclohexylmethylole	December 22, 2022	Surrey, British Columbia	Crystalline substance	-
		N-Ethylpentedrone	August 24, 2022	Port Hope, Ontario	Powder	-
		N-Propylbutylone	August 18, 2022	Boucherville, Quebec	Powder	-
Other Substances	Precursor / key intermediate / reagent	Methyl 3-oxo-2-(3,4-methylenedioxyphenyl) butanoate	October 11, 2022	West Vancouver, British Columbia	Powder	-

CONCLUSION

This At-A-Glance report describes 29 new psychoactive substances first identified by the Drug Analysis Service in 2022 in samples submitted by Canadian law enforcement agencies and public health partners. NPS identified in Canada in 2022 include 8 hallucinogens (4 tryptamines, 2 phenethylamines and 2 LSD analogs), 7 sedative/hypnotics (4 benzodiazepines, 2 quinazolinones and 1 cutting agent), 5 stimulants (4 cathinones and 1 amphetamine), 4 cannabinoids (synthetic cannabinoids), 2 dissociatives (ketamine analogs), 2 opioids and 1 other substance. Half of the NPS were identified for the first time in samples submitted by law enforcement agencies from Ontario and a quarter from law enforcement agencies in British Columbia. Co-occurring substances with newly identified NPS included Fentanyl and analogues, benzodiazepines, nitazenes and stimulants (Methamphetamine, Cocaine, MDMA and MDA). Continued monitoring of NPS is required to ensure accurate information is available to partners about potentially harmful substances and to identify emerging trends on the Canadian market.

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For more information, please contact [Health Canada's Drug Analysis Service](#)

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