AT-A-GLANCE

New psychoactive substances in Canada–2024

Government of Canada Gouvernement du Canada

Canada

Drug Analysis Service

Health Canada's Drug Analysis Service (DAS) operates laboratories across Canada that analyze illicit drugs and substances submitted by Canadian law enforcement and public health officials. DAS data is solely based on samples submitted to the laboratories and as such, samples analyzed by DAS may not be completely representative of drug seizures 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.

To improve awareness of new and emerging drugs in Canada, DAS sends notifications to law enforcement and public health officials whenever a potentially harmful substance or mixture is encountered for the first time in a province or territory, or a drug is presented in an unusual form and someone might consume it with the impression it is something else. For more information, please refer to the Drug notification map.

Summary

- The Drug Analysis Service (DAS) identified 11 new psychoactive substances (NPS) in 2024.
- In total, there were 3 opioids, 2 cannabinoids, 2 stimulants, 3 hallucinogens and 1 sedative/hypnotic.
- 7 NPS were identified in samples submitted by law enforcement and public health officials from Ontario, 3 from Quebec, and 1 from British Columbia. No first identifications of NPS were found in the other provinces and territories.
- In 2024, the nitazene N-desethyl etonitazene emerged as the most commonly identified NPS in DAS samples and had the highest number of co-occurring substances.

Aim

The aim of this report is to describe NPS that emerged in Canada in 2024 based on samples submitted to DAS by law enforcement and public health officials.

New psychoactive substance (NPS): 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 samples submitted to the DAS for analysis by law enforcement and public health officials. 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 to people who use drugs.

Data limitations

This report is based on data from DAS, which analyzes illicit drugs and substances submitted by Canadian law enforcement and public health officials. Some limitations apply to these data. First, law enforcement officials 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. Additionally, DAS's mandate is to report substances controlled under the *Controlled Drugs and Substances Act*, meaning non-controlled substances may not be reported.

Data analysis

Results of samples analyzed from law enforcement and public health submissions are stored in a centralized database called the Laboratory Information Management System (LIMS). The presented data were retrieved from the LIMS for the period January 1 to December 31, 2024. Each identification refers to the detection of one substance within a given sample. A single sample can yield multiple identifications if it contains more than one NPS.

Analyses were conducted in R4.4.1. Data wrangling and visualization were performed using the *tidyverse* and *ggplot2* packages.

New psychoactive substances in Canada in 2024

Between January 1, 2024 and December 31, 2024, the DAS identified 11 NPS in samples submitted by Canadian law enforcement and public health officials, including 3 opioids, 2 cannabinoids, 2 stimulants, 3 hallucinogens, and 1 sedative/hypnotic (Figure 1).

Of the 11 NPS, 7 of them are controlled under the *Controlled Drugs and Substances Act* (CDSA) (Table 1).

Figure 1. Number of new psychoactive substances identified by pharmacological class (2024)

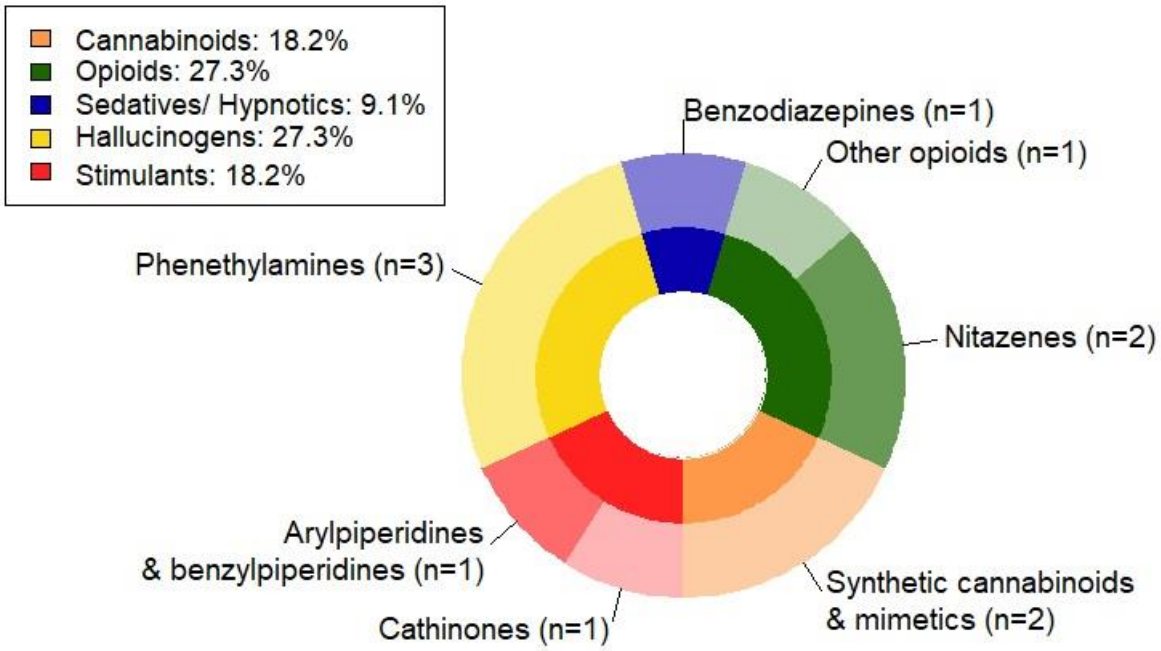
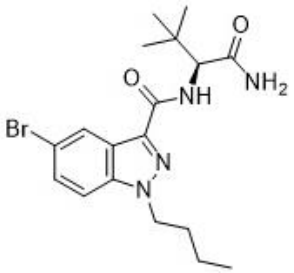
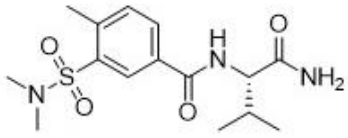
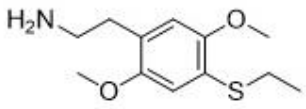
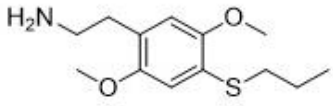
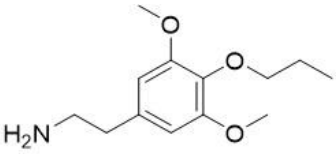
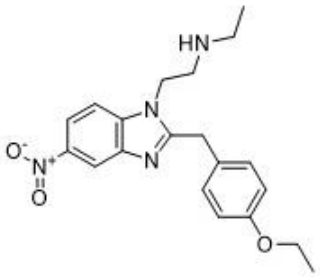
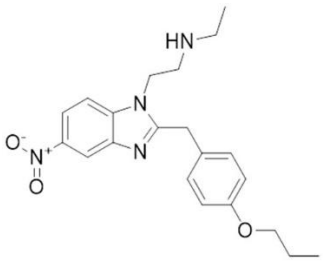
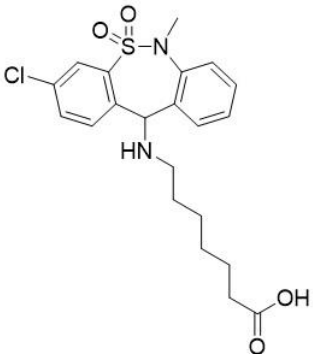
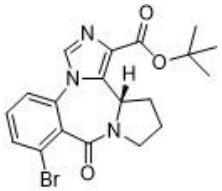
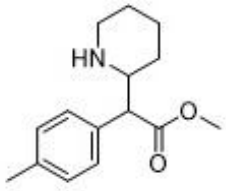
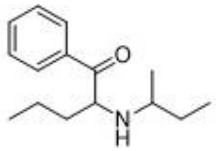


Table 1. Summary of new psychoactive substances in Canada (2024)

Pharmacological class, subclass	Substance, synonyms	Control status	Structure
Cannabinoids			
Synthetic cannabinoids and mimetics	ADB-5'BR-BINACA • ADB-BUT-5Br-INACA • ADB-5'Br-BUTINACA • *N*-[(2*S*)-1-amino-3,3-dimethyl-1-oxobutan-2-yl]-5-bromo-1-butylindazole-3-carboxamide	CDSA: Schedule II, Item 2	
	AB-MDMSBA • (S)-*N*-(1-amino-3-methyl-1-oxobutan-2-yl)-3-(*N,N*-dimethylsulfamoyl)-4-methylbenzamide	Not controlled	
Hallucinogens			
Phenethylamines	2C-T-2 • 4-Ethylthio-2,5-dimethoxybenzeneethanamine • ROSY • 4-Ethylthio-2,5-dimethoxyphenethylamine	CDSA, Schedule III, Item 35	

Pharmacological class, subclass	Substance, synonyms	Control status	Structure
	2C-T-7 • 4-Propylthio-2,5-dimethoxybenzeneethanamine • Blue Mystic • Beautiful • Tweety-Bird Mescaline • 2,5-Dimethoxy-4-propylthiophenethylamine	CDSA, Schedule III, Item 35	
	Proscaline • 2-(3,5-dimethoxy-4-propoxyphenyl)ethanamine)	Not controlled	
Opioids			
Nitazenes	*N*-desethyl Etonitazene • 2-(2-(4-ethoxybenzyl)-5-nitro-1H-benzo[d]imidazol-1-yl)-*N*-ethylethan-1-amine • 2-[(4-ethoxyphenyl)methyl]-*N*-ethyl-5-nitro-1H-benzimidazole-1-ethanamine	CDSA, Schedule I, Item 13	

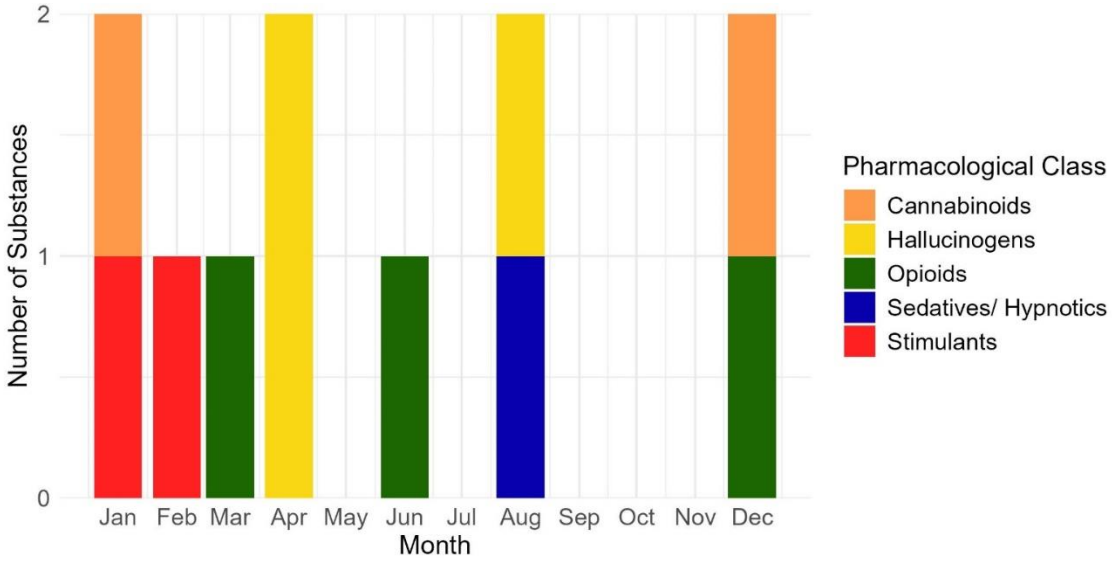
Pharmacological class, subclass	Substance, synonyms	Control status	Structure
	N-desethyl Protonitazene • *N*-Ethyl-2-(5-nitro-2-(4-propoxybenzyl)-1H-benzo[d]imidazol-1-yl)ethan-1-amine	CDSA, Schedule I, Item 13	
Other opioids	Tianeptine	Not controlled	
Sedatives/Hypnotics			
Benzodiazepines	Bretazenil	Not controlled	
Stimulants			
Arylpiperidines and benzylpiperidines	4-Methylmethylphenidate • 4-MeTMP • Methyl 2-(4-methylphenyl)-2-	CDSA, Schedule III, Sub-item 2(5)	

Pharmacological class, subclass	Substance, synonyms	Control status	Structure
	(piperidin-2-yl)acetate		
Cathinones	*N*-sec-Butyl-Pentedrone • 2-[(butan-2-yl)amino]-1-phenylpentan-1-one	CDSA, Schedule I, Item 19	

First identifications

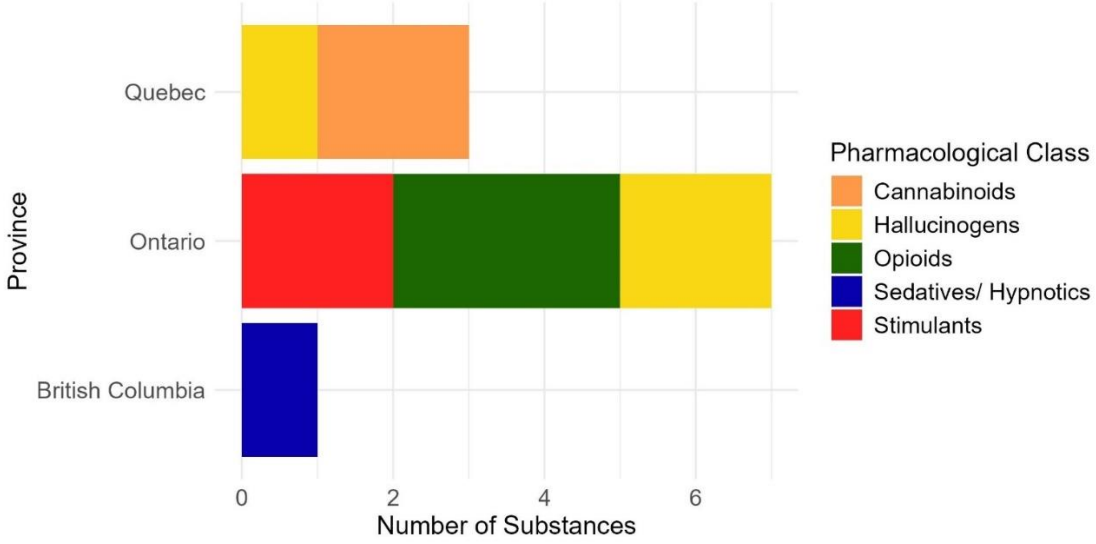
Most NPS (7) were identified within the first 6 months of 2024, with the remaining substances identified in samples submitted in August (2) and December (2) (Figure 2).

Figure 2. First NPS identification (months) in 2024 by pharmacological class



More than half (7) of the 11 NPS were first identified in samples submitted by law enforcement and public health officials in Ontario. Of the remaining 4 NPS, 3 were first identified in samples submitted by law enforcement and public health officials in Quebec and 1 in British Columbia. No NPS were initially identified in the other provinces and territories (Figure 3).

Figure 3. Number of the first NPS identification in 2024 per province and territory



New psychoactive substances profile

Additional details on NPS identified in samples submitted to DAS for analysis are provided below and in Table 2.

Cannabinoids

Synthetic cannabinoids elicit effects similar to delta-9-tetrahydrocannabinol (THC), the primary psychoactive component of cannabis. However, they have the potential to induce more potent effects than THC.

ADB-5'BR-BINACA: Also known as ADB-5'Br-BUTINACA, this novel synthetic cannabinoid receptor agonist is an analogue of ADB-BINACA [1]. Little is currently known about its activity, potency and toxicity. It has been detected in several countries in various forms including plant materials, powders and papers [1-2]. In 2024, the DAS identified this substance only once in samples submitted for analysis. It was found in liquid form and without any co-occurring substances.

AB-MDMSBA: This synthetic cannabinoid is structurally similar to others in its class [3]. There is little information available in the literature on its effects, potency or toxicity. In 2024, DAS identified this substance in 3 samples in powder form submitted by officials in Quebec, Ontario and Manitoba, each without co-occurring substances.

Hallucinogens

2C-T-2: This synthetic compound comes from the 2C-series of phenethylamine derivatives. Although it has been tested in animal studies [4-5], human data on its pharmacology, metabolism and toxicity are scarce. It has been found on the illicit market, both alone and in combination with other designer drugs [6]. In 2024, DAS identified 2C-T-2 only once in samples submitted for analysis. It was found in powder form and without any co-occurring substances.

2C-T-7: This synthetic hallucinogen produces similar effects to several schedule I hallucinogens and acts primarily through serotonin receptors. Users report visual hallucinations, mood changes, emotional sensitivity, and altered well-being. Its potency varies with dose and administration route, and effects can last between 1 and 7 hours [7]. DAS identified 2C-T-7 once in 2024. It was detected in powder form without co-occurring substances.

Proscaline: This substance is a psychedelic phenylethylamine and a structural analog of mescaline. It is known for its stimulant and psychoactive effects. Its potency is estimated to be five times that of mescaline [8]. However, pharmacological, metabolic and toxicity data remain limited. This substance was identified only once by DAS in 2024 in samples submitted for analysis. It was found in liquid form, with no other substances present.

Opioids

N-desethyl etonitazene: This novel synthetic opioid is structurally related to etonitazene, *N*-desethyl isotonitazene, and other nitazene (2-benzylbenzimidazole) analogues. Originally identified as a metabolite of etonitazene, it is now being sold independently as a drug [9]. In vitro data show that N-desethyl etonitazene is a μ-opioid receptor agonist with potency similar to etonitazene and approximately 10 times stronger than fentanyl [10]. In 2024, n-desethyl etonitazene was identified in 7 samples submitted by officials in Ontario and Prince Edward Island. DAS identified this substance in powder form (4 samples) and as residue (3 samples). Multiple co-occurring substances were identified in samples containing n-desethyl etonitazene, including fentanyl, stimulants (cocaine and methamphetamine), benzodiazepines (bromazolam and desalkylgidazepam) and cutting agents (caffeine and dimethylsulphone).

N-desethyl protonitazene: This substance is structurally similar to known nitazene opioids and may be a metabolite of protonitazene, although characterization studies are lacking in the scientific literature [11-12]. In 2024, DAS identified this substance only once in samples submitted for analysis. It was found in powder form co-occurring with ibuprofen and caffeine.

Tianeptine: This atypical tricyclic antidepressant acts as a full μ-opioid receptor agonist with anxiolytic effects. It produces euphoric, opioid-like effects that carry a high risk of dependence, overdose, and withdrawal [13]. Its short half-life and rapid tolerance can lead users to escalate doses dramatically, with some reports citing consumption over 100 times the therapeutic range [14]. Tianeptine's effects can be reversed with naloxone [13]. In 2024, DAS identified this substance in 3 samples in powder form, all submitted by law enforcement officials in Ontario, without any co-occurring substances.

Sedatives/Hypnotics

Bretazenil: Scientific data indicate that bretazenil is a potent anxiolytic and anticonvulsant that also produces strong sedative effects similar to diazepam and ethanol, resulting in drowsiness and impaired cognitive and motor functions [15-16]. DAS identified bretazenil once in 2024, in blotting paper form without co-occurring substances.

Stimulants

4-methylmethylphenidate: This novel synthetic stimulant is structurally related to methylphenidate and other phenidate analogues. It is slightly less potent than methylphenidate but is expected to have similar effects such as increased heart rate, irritability, and anxiety [17]. Available pharmacological and toxicological data are limited, with most available information based on structural analysis and in vitro studies [18]. This substance was identified only once by DAS in 2024. It was found in powder form, with no other substances present.

N-sec-butyl-pentedrone: There is little information available in the literature regarding this stimulant. In 2024, this substance was identified in 2 samples submitted by officials in Ontario and was found in powder and crystalline form, without any co-occurring substances.

Table 2. Profile of new psychoactive substances (2024)

Substance	Number of samples (2024)	First identification [a]		Description	Co-occurrences (Other substances identified in all samples) [b]
		Date	City, province		
Cannabinoids					
ADB-5'BR-BINACA	1	Jan 12th, 2024	Montreal, QC	Liquid	N/A
AB-MDMSBA	3	Dec 6th, 2024	Laval, QC	Powder or grainy substance	N/A
Hallucinogens					
2C-T-2	1	Apr 9th, 2024	Whitby, ON	Powder or grainy substance	N/A
2C-T-7	1	Apr 9th, 2024	Whitby, ON	Powder or grainy substance	N/A
Proscaline	1	Aug 6th, 2024	Montreal, QC	Liquid	N/A
Opioids					
N-desethyl etonitazene	7	Mar 19th, 2024	Lindsay, ON	Powder or grainy substance	Bromazolam, Caffeine, Dimethylsulphone, Cocaine, Methamphetamin, Fentanyl, Desalkylgidazepam
N-desethyl protonitazene	1	Dec 5th, 2024	Toronto, ON	Powder or grainy substance	Ibuprofen, Caffeine
Tianeptine	3	June 4th, 2024	Mississauga, ON	Powder or grainy substance	N/A

Substance	Number of samples (2024)	First identification [a]		Description	Co-occurrences (Other substances identified in all samples) [b]
		Date	City, province		
Sedatives/Hypnotics					
Bretazenil	1	Aug 16th, 2024	West Vancouver, BC	Blotter papers	N/A
Stimulants					
4-methylmethylphenidate	1	Feb 5th, 2024	Aurora, ON	Powder or grainy substance	N/A
N-sec-butyl-pentedrone	2	Jan 15th, 2024	Aurora, ON	Crystalline substance	N/A

[a] Location of first appearance in Canada is indicated

[b] Only Nitazenes were found to be co-occurring with other substances

Other new substances

In 2024, DAS identified 2 other new substances in samples submitted for analysis by Canadian law enforcement and public health officials. Both of these substances are precursors which are used in the synthesis of psychoactive substances and do not produce psychoactive effects. These substances were found co-occurring in the same samples in liquid form (Table 3).

Table 3. Profile of other new substances (2024)

Pharmacological class, subclass	Substance	Number of samples (2024)	First identification [c]		Description	Co-occurrences (Other substances identified in all samples)
			Date	City, province		
Other, Precursors / key intermediates / reagents	Ethyl 4-(*N*-phenylpropionamido)piperidine-1-carboxylate	2	Oct 28th, 2024	Mission, BC	Liquid	Methyl *N*-boc norfentanyl, Methyl 4-anilino-1-BOC-piperidine
	Methyl *N*-boc norfentanyl	2	Oct 28th, 2024	Mission, BC	Liquid	Ethyl 4-(N-phenylpropionamido) piperidine-1-carboxylate, Methyl 4-anilino-1-BOC-piperidine

[c] Location of first appearance in Canada is indicated.

Conclusion

In 2024, Health Canada's Drug Analysis Service identified eleven new psychoactive substances—spanning opioids, synthetic cannabinoids, stimulants, hallucinogens and a sedative/hypnotic—and 2 additional synthesis-related precursors in samples submitted by law enforcement and public health officials. Over half of these substances were first detected in Ontario, with N-desethyl etonitazene emerging as the most frequently encountered NPS. Continued, timely monitoring and information sharing on newly identified substances are critical to informing public health responses and harm-reduction strategies.

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Suggested citation

Government of Canada. (2025). Health Canada Drug Analysis Service. At-a-glance: New psychoactive substances in Canada - 2024. Longueuil (QC), 2025.

For more information, please contact Health Canada's Drug Analysis Service.

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