

CCENDU Bulletin

Synthetic Cannabinoids in Canada

Summary

- Synthetic cannabinoids are substances some of which are designed to mimic the effects of Δ^9 -tetrahydrocannabinol (THC), the main psychoactive ingredient in cannabis.
- There have been over 84 different synthetic cannabinoids identified internationally (as of May 2013).
- Synthetic cannabinoids are frequently sprayed on plant material and marketed as various branded products (e.g., “Spice,” “K2” or “IZMS”) that are often sold as legal alternatives to cannabis.
- Although synthetic cannabinoid products are often identified as “legal highs” or “herbal incense” this does not make them safe.
- The chemical contents of synthetic cannabinoid products are unknown, untested and can differ between brands and even within brands. This inconsistency, as well as the limited research on the products, makes it difficult to predict the short- and long-term health harms.
- The use of synthetic cannabinoid products has been associated with seizures, irregular heartbeat, panic attacks, agitation, hallucinations and, in a few cases, death.
- According to the Ontario Student Drug Use and Health Survey, 1.8% of Ontario students in grades 7–12 have used synthetic cannabinoid products in the past year.
- Canadian Community Epidemiology Network on Drug Use (CCENDU) sites report that use of synthetic cannabinoid products is not currently a pressing concern, but that they are monitoring the situation.

Background

Synthetic cannabinoids (SCs) are a large and diverse group of chemicals or substances. Some have psychoactive properties and in the last five years have been marketed for recreational use as legal alternatives to cannabis. SCs that are manufactured and sought out for abuse purposes attach to and activate the same biological receptor that is targeted by THC (Δ^9 -tetrahydrocannabinol), the principal psychoactive ingredient in cannabis. Substances that behave this way are referred to as cannabinoid receptor agonists, cannabimimetics, THC homologs, synthetic marijuana and legal weed. SCs that are being used in SC products are manufactured in clandestine laboratories. As of May 2013 there have been over 84 different SCs identified internationally (European Monitoring Centre for Drugs and Drug Addiction, 2013). Of these, preliminary figures show that 14 SCs have been identified in samples seized by Canadian law enforcement (as of 2013). Examples of these compounds include JWH-018, AM2201 and XLR-11.



SCs are typically purchased online or, particularly for SCs controlled under the *Controlled Drugs and Substances Act* (CDSA), via the black market. They are then dissolved in a solvent and sprayed on dried plant material (e.g., marshmallow, mullein or damiana leaves), so that the end product appears more “herbal” or “natural.” The sprayed plant material is then placed in small packets and branded with names such as “Spice,” “K2” or “IZMS,” and sold as “herbal incense” or “herbal smoking blends.” SC products are frequently labeled “not for human consumption,” which might be an attempt to circumvent drug laws in the jurisdictions in which they are sold.

Harms

There is limited information on the nature and extent of the harms associated with SC product use. In the United States there were approximately 11,406 emergency department visits in 2010 that involved use of a SC product (Substance Abuse and Mental Health Services Administration, 2012). Short-term harms have been documented in case studies and include seizures (Tofighi & Lee, 2012), irregular heartbeat (Lapoint et al., 2011) and acute kidney injury (Centers for Disease Control and Prevention, 2013). Anecdotal reports suggest users have also experienced panic attacks, agitation, hallucinations, psychotic episodes and nausea or vomiting after using SC products. At least three deaths have been attributed to use of synthetic cannabinoid products (Gurney, Scott, Kacinko, Presley, & Logan, 2014).

The long term effects of SCs are largely unknown as most SCs have not been studied in humans (Gurney et al., 2014). However, there is some evidence that chronic use can result in dependence or withdrawal symptoms upon cessation (Vandrey, Dunn, Fry, & Girling, 2012). Smoking of plant material containing SC can irritate or damage respiratory passages. Individuals who have a personal or family history of psychosis or schizophrenia might be at a greater risk of experiencing a psychotic episode or onset of schizophrenia.

Owing to the manner in which the branded products containing SCs are manufactured, the type, quality and potency of chemical or chemicals in these products are unknown. In addition, variations can occur from packet to packet of the same branded product. This variation can lead to experimentation to acquire the desired effects, which can result in users consuming too much and experiencing harm.

Epidemiological Data

Currently, there is limited epidemiological research on SC product use in Canada. According to the 2013 Ontario Student Drug Use and Health Survey (OSDUHS), 1.8% of Ontario students in grades 7–12 reported using SC products in the past year (Boak, Hamilton, Adlaf, & Mann, 2013). Among exhibits seized by Canadian law enforcement, the number of exhibits analyzed containing SCs rose from two in 2009 to a preliminary figure of 343 in 2013.¹

Compared to their Canadian counterparts, American high school students had a much higher rate of SC product use (12%) (Center for Substance Abuse Research, 2013a). The number of calls to poison control centres in the United States rose from zero in January 2010 to 705 in July 2011 and then dropped to approximately 250 calls a month (Center for Substance Abuse Research, 2013b). The United States also experienced a sharp rise in the number of SC reports submitted to state and local forensic laboratories (13 were reported in 2009, while approximately 3,000 were reported in 2010).

¹ This information was obtained from Health Canada's Drug Analysis Service (DAS) Laboratory Information Management System (LIMS) on January 28, 2014, and is preliminary for 2013. Note that DAS only analyzes a subset of the substances seized by law enforcement agencies, which would also be a subset of the substances found on the illicit market. Statistical analysis for this report was conducted by Health Canada's Office of Research and Surveillance.



Qualitative research conducted with SC product users in California found that most use the drug instead of cannabis in an effort to avoid positive drug tests (Perrone, Helgesen, & Fischer, 2013).

Legality

As with other novel psychoactive substance, there has been confusion regarding the legality of SC products. However, according to Health Canada:

Products containing ingredients that are similar synthetic preparations of cannabis are regulated under the *Controlled Drugs and Substances Act* (CDSA). All activities associated with them (e.g., production, distribution, import, export, etc.) are illegal in Canada. Law enforcement is authorized to seize these products at points of entry and/or remove them from retail outlets. (2013)

SCs, as well as other novel psychoactive substances, pose unique challenges to those amending or developing drug control legislation. The speed with which new substances are manufactured means that introducing specific legislation to control each new substance as they emerge can easily become a futile effort in which legislators are constantly one step behind manufacturers. Some countries (e.g., United Kingdom, Hungary, United States, Canada) have taken an approach that involves modifying existing legislation. For example, a country can change its definition of an existing controlled substance by modifying existing language to include modifications or derivatives of a core molecule. Alternatively, a country can extend its definition to include chemical structures that are “substantially similar” (i.e., analogues) to an existing controlled substance, often with the requirement that it has or is alleged to have similar psychoactive effects.² Other countries (e.g., New Zealand) have taken a more innovative approach and place the onus on the manufacturer requiring them to prove their products present “no more than a low risk of harm” to be licensed for legal sale.

Reports from CCENDU

In December 2013, CCENDU members were asked to provide any information they had regarding the use, sale, or harms associated with SC products. In general, CCENDU partners reported that SC products are either not being widely used or have not yet been responsible for a great deal of harm in their communities. In some communities (Vancouver, Calgary, Edmonton and Toronto), law enforcement has taken steps to limit the supply of these products by removing them from local shops and informing vendors that many of the products being sold contain substances that are controlled by being listed on Schedule II of the CDSA. Below is a summary of the information obtained from the seven reporting CCENDU sites.

Vancouver, British Columbia: CCENDU partners report they currently do not consider SC products a pressing concern. It is thought that the availability of marijuana has resulted in very little interest in synthetic versions of the drug.

Calgary and Edmonton, Alberta: Reports from treatment providers indicate that they are becoming increasingly concerned about SC products. Reports from Alberta RCMP indicate that SC products are readily available in Alberta and that their availability from local drug paraphernalia shops increased between 2009 and 2013. Local police forces have executed search warrants and conducted investigations; while some charges have been laid with regard to possession or sale of SC products, the outcome of these cases is still unknown at this time.

² In Canada, SCs cannot be controlled on the basis of structural similarity, but rather based on pharmacological activity.



Saskatoon, Saskatchewan: CCENDU partners report they currently do not consider SC products a pressing concern.

Winnipeg, Manitoba: Treatment providers report some clients using SC products. While most clients have heard of SC products and some have tried them, it does not appear to be a substance used regularly. It is currently unknown whether these products are available for purchase locally.

Toronto, Ontario: No local data is available regarding the use of SC products. In the fall of 2013, Toronto Police contacted convenience store owners to educate them and ask them to stop selling SC products. In November 2013 and March 2014,³ the Toronto Drug Squad executed a series of search warrants resulting in the seizure and analysis of several products, including those sold under the name IZMS. Allegedly several thousand packages were seized, valued at \$300,000. Health Canada confirmed that the seized products contained controlled substances. Drugs were sold online and in retail locations. Arrests were made and several charges were laid related to production, possession and trafficking, and the investigation is ongoing.

Halifax, Nova Scotia: SC product use has been reported in two Nova Scotia regions. CCENDU partners report that its use is particularly frequent among chronic marijuana users and among individuals who undergo drug testing for employment.

St John's, Newfoundland: There are a number of drug paraphernalia shops selling SC products. These products are being marketed as potpourri and incense. Local RCMP has spoken to users of the drug who report psychosis-like experiences and respiratory problems from smoking the product. In a raid by RCMP of a local shop, a brand of SC product known as “Zap-R” was seized. Analysis identified the chemical AM-2201, which is an illegal substance.

CCENDU will continue to monitor the situation regarding synthetic cannabinoid products in Canada. If you have any questions, comments, information to contribute or corrections to the information contained in this bulletin, or wish to subscribe and receive updates as new information becomes available, please contact CCENDU@ccsa.ca.

For more information on CCENDU and to review previous CCENDU Alerts and Bulletins please visit www.CCENDU.ca.

Additional Resources

- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA): “[Synthetic Cannabinoids and ‘Spice’](#)”
- FRANK: “[Synthetic Cannabinoids.](#)”
- National Cannabis Prevention and Information Centre (NCPIC), “[Synthetic Cannabinoids.](#)”

³ Toronto Police Service. News Release: Public Safety Alert, Search warrants executed, “IZMS” and “PUREPILLZ” seized as Controlled Substances in Toronto and Peel Region. March 6, 2014: <http://www.torontopolice.on.ca/newsreleases/release.php?id=28640> .



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Canadian Community Epidemiology Network on Drug Use (CCENDU)

The Canadian Community Epidemiology Network on Drug Use (CCENDU) is a nationwide network of community level partners who share information about local trends and emerging issues in substance use and exchange knowledge and tools to support more effective data collection.

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