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The Rise of Delta-8 THC: Understanding the Trends, Risks, and Implications in Schools

Exploring the Impact of Delta-8 and Delta-9 THC in an Educational Setting

This comprehensive white paper delves into the complexities of Delta-8 THC and Delta-9 THC, exploring their pharmacological properties, potential side effects, abuse concerns, and recent trends in schools. Drawing on data from samples collected in educational environments, we analyze the prevalence of Delta-8 and Delta-9, highlighting the need for proactive measures to address the growing use of these cannabinoids among students.

This whitepaper highlights the growing popularity of Delta-8 due to it legality and milder effects, while also addressing the psychoactive risks and implications for youth of both Delta-8 and Delta-9 in school settings.

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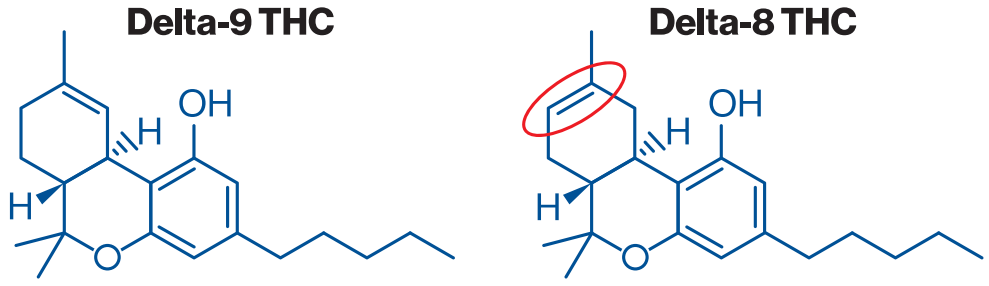
Delta-8 THC and Delta-9 THC are two cannabinoids found in the cannabis plants, each with similar psychoactive effects. Delta-8, though less potent than Delta-9, has gained popularity recently due to its legal status and purported milder psychoactive effects. Despite their differences, both cannabinoids pose risks, mainly when used by adolescents and young adults. This paper aims to provide a comprehensive overview of Delta-8 and Delta-9, their effects on the body and mind, and the implications of their increasing use in school settings.

The Science Behind Delta-8 THC and Delta-9

THC Molecular Structures

Delta-8 THC (delta-8-tetrahydrocannabinol) and Delta-9 THC (delta-9-tetrahydrocannabinol) are two cannabinoids found in the cannabis plants with similar molecular structure. These cannabinoids interact with the endocannabinoid system in the human body, producing various psychoactive effects.



Delta-8 THC

Delta-8 THC is a cannabinoid that occurs naturally in cannabis plants, albeit in much lower concentrations than Delta-9 THC. The molecular structure of Delta-8 THC differs from Delta-9 THC by movement of the double bond (denoted by the double lines) from position 9 to position 8 on the molecule, hence its name “Delta-8”. This double bond is highlighted in red in the molecular structure.

Delta-9 THC

Delta-9 THC is the primary psychoactive compound found in cannabis plants and is responsible for the “high” or intoxicating effects of marijuana use. The molecular structure of Delta-9 THC is similar to that of Delta-8 THC, but the double bond is on the 9th carbon atom.

Comparison

While Delta-8 and Delta-9 THC have similar molecular structures, the double bond placement gives them distinct properties. Delta-9 THC is known for its potent psychoactive effects, while Delta-8 THC is considered to be less powerful, producing a milder high. This potency difference is attributed to how the two cannabinoids interact with the endocannabinoid system in the brain and body.

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Delta-8 THC

What You Need to Know

Delta-8 is a psychoactive compound found in cannabis.

National poison control centers handled 2,362 delta-8 cases in a 14-month period.

The kind you can buy is made in a lab.

These products aren't controlled by the FDA.

Users call it "diet weed" since it doesn't get you as high as the THC in marijuana.

You could get a stronger dose than you think or be exposed to harmful chemicals.

It might make you feel euphoric, relaxed, hungry, or pain-free.

Delta-8 THC, or delta-8-tetrahydrocannabinol, is a cannabinoid that occurs naturally in cannabis plants, albeit in much lower concentrations than its more famous cousin, Delta-9 THC. Both compounds have similar molecular structures, but Delta-8 has a double bond on the 8th carbon atom, whereas Delta-9 has it on the 9th, hence their names.

One of the critical differences between Delta-8 and Delta-9 THC is their psychoactive potency. Delta-8 is considered less potent than Delta-9, which may produce a milder high.

Another important distinction is the legal status of Delta-8 THC. While Delta-9 THC is classified as a Schedule I controlled substance in the United States, Delta-8 is legal under federal law due to the Farm Bill of 2018. This legal loophole has led to a proliferation of Delta-8 products, including edibles, tinctures, and vape cartridges.

Despite its legal status, Delta-8 THC is not without risks. Like Delta-9 THC, Delta-8 can impair judgment, coordination, and motor skills, making it unsafe to drive or operate heavy machinery while under its influence. Additionally, Delta-8 can cause anxiety, paranoia, and other adverse psychological effects, especially in high doses or in individuals who are sensitive to THC.

It is also important to note that the long-term effects of Delta-8 THC are not well understood, as research on this cannabinoid is still in its early stages.

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Delta-9 THC

Delta-9 tetrahydrocannabinol (THC) is the primary psychoactive compound found in cannabis plants. It is responsible for the "high" intoxicating effects commonly associated with marijuana use. Delta-9 THC interacts with the endocannabinoid system in the brain and body, specifically with the CB1 receptors, which are part of the central nervous system.

When Delta-9 THC binds to CB1 receptors, it can alter various cognitive and physiological processes, leading to the characteristic effects of marijuana use. These effects include euphoria, relaxation, altered sensory perception, and increased appetite or "the munchies."

One of the critical characteristics of Delta-9 THC is its potency. Compared to other cannabinoids, such as Delta-8 THC, Delta-9 THC is known for its strong psychoactive effects. The potency of Delta-9 THC can vary depending on the strain of cannabis and the method of consumption, with smoking or vaping typically producing more immediate and intense effects compared to oral ingestion. This potency is influenced by the concentration of Delta-9 THC in the marijuana or edible being consumed. Higher concentrations of Delta-9 THC are associated with stronger psychoactive effects, regardless of the consumption method.

Delta-9 THC also has the potential for abuse and addiction. Regular use of Delta-9 THC can lead to the development of tolerance, where higher doses are needed to achieve the same effects, as well as dependence, where individuals may experience withdrawal symptoms when they stop using the drug. Also of note is the increasingly elevated concentration of Delta-9 THC in marijuana, a recent study by El Sohly et al. found the mean Delta-9 THC concentration of cannabis preparations received at their laboratory has doubled over the 2008-2017 time period (el Sohly et al. 2019).

Long-term or heavy use of Delta-9 THC has been associated with a range of adverse health effects. These can include cognitive impairments, such as memory and attention deficits, respiratory issues from smoking, and mental health disorders, such as anxiety and psychosis, particularly in individuals predisposed to these conditions.

Cannabinoid use among adolescents presents a significant health issue: adolescence is a critical period of neural development and a later stage opportunity to sculpt the brain before a person reaches adulthood. Studies conducted among adolescent populations have shown impaired cognition concerning executive functioning, processing speed, attention, and memory in adolescent cannabis users when compared to controls of the same age, with some suggestions that the magnitude of this impairment may be greater than in adult cannabis users, particularly in the domains of learning and memory. Cognitive performance deficits spanning a range of executive function domains have been found in cannabis users to be associated with the age of onset of cannabis use, such that earlier onset was related to worse performance. In a longitudinal cohort study following participants up to age 38, adolescent-onset cannabis users were found to have a greater decline in IQ than adult-onset users when correcting for pre-use educational scores. (See Blest-Hopley and references cited within). While previous studies have not isolated the long-term effects of Delta-8 THC usage on the adolescent brain, a reasonable chance of very similar outcomes resulting from long-term Delta-8 THC usage is likely given the similar molecular structure and pharmacological effects of Delta-8 and Delta-9 THC.

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Side Effects and Risks of Delta-8 and Delta-9 THC

Both Delta-8 THC and Delta-9 THC can produce a range of side effects, some of which can be potentially harmful, mainly when used in high doses or over an extended period.

Psychoactive Effects

Both Delta-8 and Delta-9 THC can cause psychoactive effects, including euphoria, relaxation, altered perception of time, and changes in sensory perception. These effects can impair judgment and coordination, making dangerous activities like driving or operating machinery.

Anxiety and Paranoia

In some individuals, especially those who are sensitive to THC or who consume high doses, Delta-8 and Delta-9 THC can cause anxiety, paranoia, and panic attacks. These effects can be particularly pronounced in individuals with a history of anxiety disorders or other mental health conditions.

Cognitive Impairment

Chronic use of Delta-8 and Delta-9 THC has been associated with cognitive impairments, including memory and attention deficits. These effects can be long-lasting and may persist even after the acute effects of THC have worn off.

Respiratory Issues

Smoking cannabis products, including those containing Delta-8 or Delta-9 THC, can irritate the lungs and airways, leading to respiratory issues such as coughing, wheezing, and bronchitis. Long-term smoking of cannabis has also been linked to an increased risk of lung cancer.

Interaction with Medications

Delta-8 and Delta-9 THC can interact with certain medications, including antidepressants, antipsychotics, and sedatives. These interactions can lead to increased side effects or reduced effectiveness of the medicines.

Mental Health Effects

There is some evidence to suggest that Delta-8 and Delta-9 THC may exacerbate or trigger mental health conditions such as anxiety, depression, and psychosis, particularly in individuals who are predisposed to these conditions.

Addiction and Dependence

Both Delta-8 and Delta-9 THC have the potential to be addictive, especially in individuals who use them regularly or in high doses. Chronic use can lead to the development of tolerance, where higher doses are needed to achieve the same effects, as well as dependence, where individuals may experience withdrawal symptoms when they stop using the drug.

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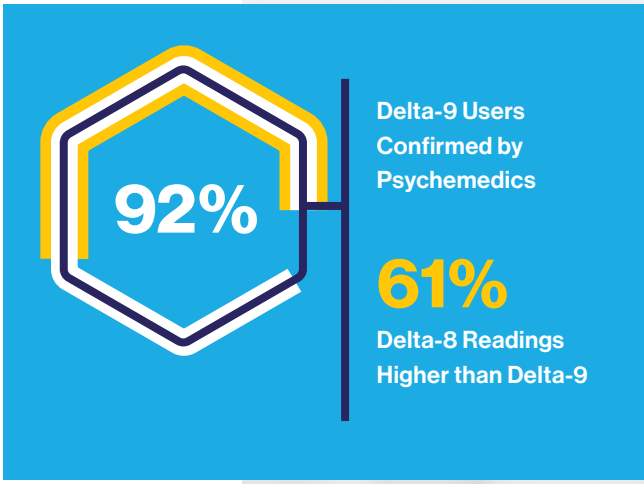
Abuse Concerns and Trends in Schools

The Crucial Role of Hair Testing

Data and analysis were conducted based on hair testing results taken in January and February of 2023, providing valuable insights into the prevalence of Delta-8 and Delta-9 THC use among students in educational settings. The analysis of 216 samples containing cannabinoids collected from students revealed concerning trends regarding the use of these cannabinoids.



Of the samples analyzed, 202 showed levels of Delta-9 carboxy-THC greater than one pg/10 mg, indicating the use of Delta-9 carboxy.

Similarly, 200 samples had levels of Delta-8 carboxy-THC greater than one pg/10 mg, with 123 samples exhibiting higher levels of Delta-8 carboxy-THC than Delta-9 carboxy-THC. This indicates that Delta-8 use is also prevalent among students, and in a significant number of cases, its presence exceeds that of Delta-9 THC. This is particularly concerning as Delta-8 THC, although less potent than Delta-9, can still cause psychoactive effects and impair judgment and coordination.

Within this set, we are encountering several cases where Delta-9 carboxy-THC is present at concentrations greater than the cutoff of 1 pg/10mg, but where Delta-8 carboxy-THC is present at much higher concentrations (greater than 10-fold difference is not uncommon). Given the low relative concentrations of Delta-9 carboxy-THC, we believe that this analyte may be present due to contamination of Delta-8-THC products with trace amounts of Delta-9-THC.

The high prevalence of Delta-8 THC in educational settings raises concerns about its potential for abuse and its impact on student health and academic performance. The psychoactive effects of Delta-8 THC can affect students' cognitive abilities, memory, and concentration, which are crucial for academic success. Moreover, the use of Delta-8 THC at a young age can increase the risk of developing dependence and addiction later in life.

These findings underscore the importance of addressing cannabinoid use among students and implementing effective prevention and education programs to mitigate the risks associated with Delta-8 and Delta-9 THC use.

Recent Legal and Regulatory Developments

The legal status of Delta-8 THC has been a subject of recent legal and regulatory developments, leading to confusion and challenges for schools and educational institutions. While Delta-8 derived from hemp is legal under federal law, some states have implemented restrictions or outright bans on its sale and use.

The legality of Delta-8 THC hinges on the specific wording of the 2018 Farm Bill, which was intended to legalize hemp cultivation. Hemp is defined as a cannabis plant containing less than 0.3% Delta-9 THC. One unintended consequence of the wording of the bill was that it effectively legalized (federally) all cannabinoids found in the marijuana plant except for Delta-9-THC.

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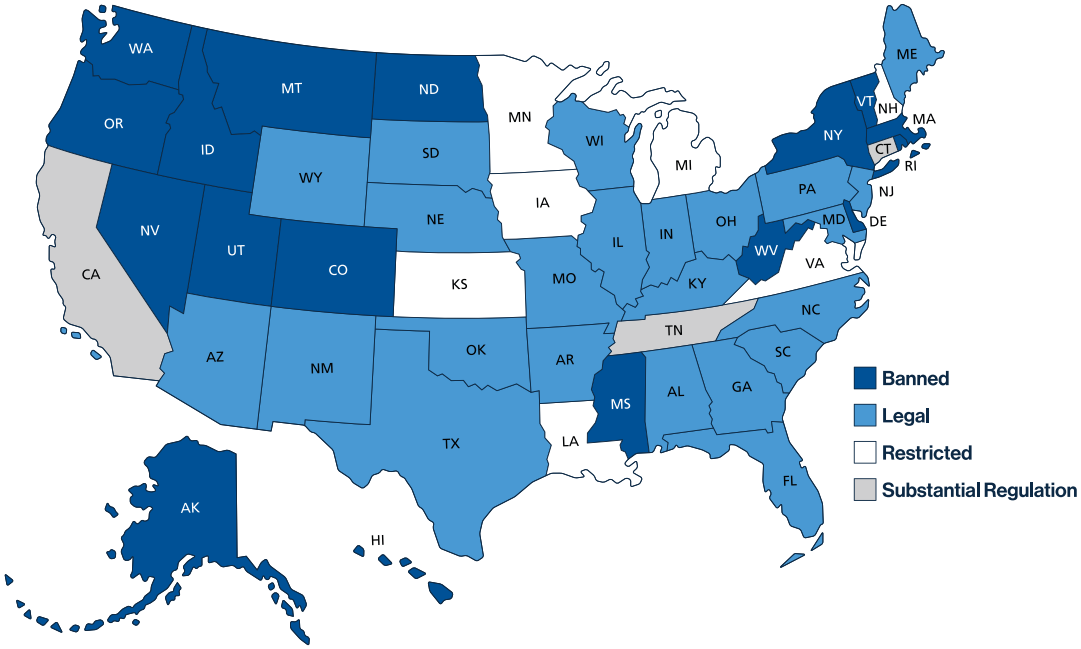
However, several states have taken steps to regulate Delta-8 THC more strictly. Some states have explicitly banned the sale and use of Delta-8 products, citing concerns about their psychoactive effects and potential for abuse. Others have implemented stricter regulations, requiring Delta-8 products to be labeled and sold only in licensed dispensaries.



These legal and regulatory developments have created challenges for schools and educators. The widespread availability of Delta-8 products, both online and in stores, makes it difficult to control access and prevent use among students. Additionally, the lack of consistent regulations across states adds to the complexity of addressing the issue effectively.

The Importance of Drug Testing

Ensuring Accuracy in Detecting Delta-8 and Delta-9 Carboxy

Drug testing plays a crucial role in detecting the presence of cannabinoids like Delta-8 and Delta-9 in individuals, particularly in educational settings where substance abuse prevention is a priority. Among the various methods of drug testing, hair testing stands out for its accuracy and reliability in detecting cannabis use over an extended period.

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Hair Testing for Delta-8 Carboxy and Delta-9 Carboxy

Hair testing is a widely used method for detecting drug use, including cannabis. When a person consumes cannabis, the active compounds, including Delta-8 and Delta-9 THC, are metabolized by the body and deposited into the hair follicles through the bloodstream, with the Delta-8 and Delta-9 carboxy THC analytes proving THC consumption. These compounds become trapped in the hair shaft as the hair grows, providing a timeline of drug use for several months.

Hair testing for Delta-8 and Delta-9 carboxy THC offers several advantages over other forms of drug testing:

Long Detection Window

Hair testing can detect drug use for up to 90 days or more, depending on the length of the hair sample. This long detection window provides a comprehensive history of an individual's drug use.

Accuracy and Reliability

Hair testing is highly accurate and reliable, and our patents and wash protocol eliminate the risk of false positives. This makes it a valuable tool for identifying individuals who have used Delta-8 and Delta-9 THC.

Non-Invasive

Collecting a hair sample for drug testing is non-invasive and does not require specialized training. This makes it convenient for use in various settings, including schools and workplaces.

Deterrent Effect

The knowledge that hair testing can detect drug use over an extended period can act as a deterrent, discouraging individuals from using Delta-8 and Delta-9 THC and other substances.

Drug testing, particularly hair testing, plays a vital role in detecting Delta-8 and Delta-9 THC use among individuals, including students. The accuracy and reliability of hair testing makes it an invaluable tool for identifying drug use and implementing appropriate interventions. By ensuring accurate drug testing practices, educational institutions can effectively address the use of Delta-8 and Delta-9 THC and promote a safe and healthy learning environment for all.

Conclusion

The rise of Delta-8 THC presents significant challenges for schools and educational institutions. The data from samples collected in educational settings highlights the increasing prevalence of Delta-8 and Delta-9 THC among students, with many samples showing higher levels of Delta-8 than Delta-9. This trend raises concerns about the potential for abuse and its impact on student health and academic performance.

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It is clear that Delta-8 and Delta-9 THC pose risks, particularly when used by adolescents and young adults. Both cannabinoids can cause psychoactive effects, cognitive impairments, and respiratory issues, among other health concerns. Chronic use can lead to dependence, addiction, and mental health disorders, making it imperative for schools to address the issue proactively.

Recent legal and regulatory developments have added to the complexity of addressing Delta-8 THC use in schools. While Delta-8 is legal under federal law, some states have implemented restrictions or bans on its sale and use. This patchwork of regulations makes it challenging for schools to enforce relevant laws and prevent access to Delta-8 products.

In conclusion, schools must prioritize education and prevention efforts to inform students about the risks of Delta-8 and Delta-9 THC and discourage their use. By implementing effective strategies, such as drug education and testing programs, counseling services, and enforcement of relevant laws, schools can help protect the health and well-being of their students and create a safer learning environment for all.

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