

Article

A Tale of Two Cannabinoids: Marijuana vs. Hemp

How the Passing of Texas Bill HB 1325 Quickly Became a Criminal Justice Nightmare

Jasmine M. Drake, Ph.D.,¹ Elycia S. Daniel, M.A.,^{1,2} and Jennifer W. Bourgeois, M.S.¹

¹Texas Southern University Center for Justice Research
Houston, TX.

²Department of Sociology and Criminal Justice, Clark-Atlanta University
Atlanta, GA

Abstract

As Marijuana decriminalization legislation rapidly sweeps across the United States for either medicinal or recreational use, the potential ramifications for the criminal justice and crime laboratory have not yet been fully explored. Although Marijuana is illegal on a Federal level, the definition of Marijuana is now changing based on new Federal and local legal requirements. For example, according to the U.S. Farm bill, Hemp products, which have Δ -9 tetrahydrocannabinol or THC concentrations $< 0.3\%$ are no longer considered as illegal, according to Federal Law. Similarly, with the passing of HB 1325 in Texas, the legal definition of Marijuana has also changed to only include products or plant materials with Δ -9 THC concentrations $> 0.3\%$. These new legal requirements not only impact the public but may create new obstacles for crime laboratories and the criminal justice system in the analysis and the prosecution of marijuana charges. In this paper, the new definitions of legal Hemp vs. illegal Marijuana will be presented along with the potential considerations and implications for the criminal justice system and crime laboratories in Texas.

Keywords: Cannabinoids, Marijuana, Hemp, Texas Bill HB 1325, Δ -9 THC, Quantitation

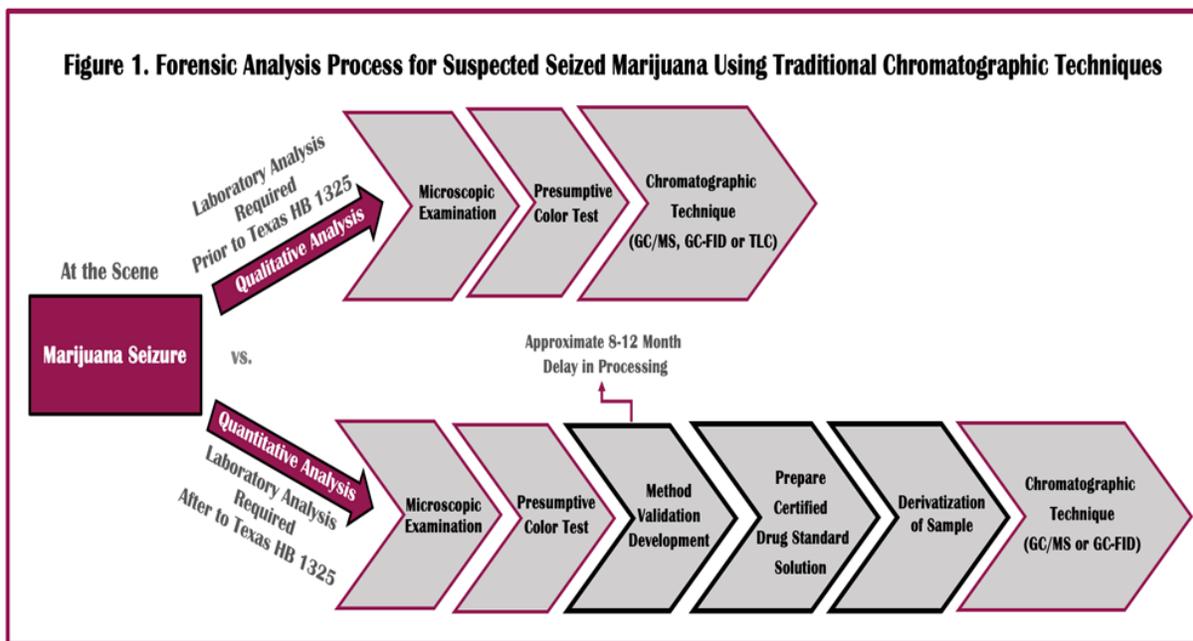
Introduction

The history of the cannabis plant is extensive, and belongs to the Cannabaceae family originating from Central Asia. The plant (*Cannabis sativa* L.) and its various products (marijuana, hemp, and hash oil) has a history of use for both medicinal and recreational purposes. Marijuana or *Cannabis sativa* L. is a complex plant consisting of over 400 distinct compounds including terpenes and over 60 cannabinoids.^{1,2} The main psychoactive component, Delta-9 Tetrahydrocannabinol or Δ -9 THC, is Federally controlled according to the Schedule I of the Controlled Substances Act (CSA).³ One of the non-psychoactive components in Marijuana, cannabidiol (CBD), is abundant in Hemp products and has garnered recent attention by the public for its potential therapeutic use in treatments for illnesses, such as cancer, chronic pain, inflammation, anxiety and epilepsy. As marijuana decriminalization has rapidly swept across local jurisdictions, and over two-thirds of the states in the U.S. have legalized cannabis and its products for either medicinal or recreational purposes,⁴ the Federal Law clearly defines that marijuana and its products containing concentrations of Δ -9 THC over 0.3 % are illegal. However, hemp products, which are derived from the same plant and contain a low concentration of Δ -9 THC (below 0.3 %) but higher content of the non-psychoactive CBD, are legal and commonly found in products, such as twine, clothing, protein powders, essential oils and food additives. According to the United Nations Office on Drugs and Crime Recommendations for Analysis of Cannabis, there is a distinction between drug-type Cannabis plants and products (Δ -9 THC > 0.3 %) and Hemp fiber-type plants and products (Δ -9 THC < 0.3 %).⁵ In 2018, provisions for Hemp farming in the U.S. Farm bill became law and removed Hemp (Δ -9 THC < 0.3 %) from the list of Schedule I controlled substances.

On April 24, 2019, the Texas House of Representatives unanimously voted to legalize farming of industrial Hemp with the passing of Texas HB 1325. Although hemp was previously legal in Texas, it was illegal for farmers to grow. Additionally, there was a “gray area” regarding the legality of CBD oil and Hemp products, due to Texas Law, which previously listed Δ -9 THC, and all other cannabinoids in Marijuana illegal. With the passing of Texas HB 1325, amendments were made to the definition of a controlled substance in the Texas Health and Safety Code §481.002 (5) to exclude Hemp, which is defined as any part of the plant including seeds, derivatives, extracts, cannabinoids, isomers, acids, salts and salts of isomers with Δ -9 THC < 0.3 % on a dry weight basis.⁶ This law renders Hemp or CBD derived products to be excluded from the list of controlled substances and therefore from criminal prosecution in the State of Texas. Marijuana (Δ -9 THC > 0.3), which is defined as the any part of the plant including extracts, derivatives, and seeds that can be germinated is still illegal according to, both, Federal and Texas Law. Although the initial intention of passing Texas HB 1325 was to boost the agriculture and farming industry by allowing Texas farmers to benefit from the booming marketability in the forecasted 20-billion-dollar industry of Hemp farming, it may have inadvertently created a criminal justice logistical nightmare by requiring crime laboratories to quantitatively test all suspected marijuana seizures to meet the new legal requirements. Currently, crime laboratories in Texas are not equipped with validated methods or instruments for the quantitation of Δ -9 THC and other cannabinoids present in marijuana. This has led to numerous reports in the media asking the question as to if this law has de facto legalized marijuana until crime laboratories are capable of catching up to the new legal requirements for testing. In this paper, the potential implications considerations and implications of the passing of Texas HB 1325 for the criminal justice system and crime laboratory communities will be explored.

Limitations to Current Qualitative Methods

Prior to the passing of Texas HB 1325, crime laboratories were only required to qualitatively analyze (confirm the presence) of Δ -9 THC in their laboratory reporting. This qualitative reporting was sufficient to meet the legal requirements, according to, both, Federal and Texas Law. Current marijuana testing in most crime laboratories in Texas include: 1) a microscopic examination, which should show the presence of bear-claw shaped cystolithic hairs, 2) a presumptive color test (Modified Duquenois-Levine), which would show a purple color in the presence of marijuana, and 3) an additional test, such as gas chromatography-mass spectrometry (GC/MS), gas chromatography coupled with flame ionized detection (GC-FID), or thin layer chromatography (TLC) with the use of certified drug standards to confirm the presence of Δ -9 THC as shown in Figure 1.



However, with the passing of Texas HB 1325, which excludes Hemp and its products (Δ -9 THC < 0.3 %) from legal prosecution, crime laboratories are now faced with the new challenge of performing quantitative analysis (determining the exact concentration of Δ -9 THC) on suspected marijuana evidentiary seizures. This may create a daunting task for crime laboratories in Texas, who are currently not equipped with the required validated methods or instrumentation for marijuana or Δ -9 THC quantitation. Complicating the path forward for crime laboratories will also be the quantitation of the ever growing so popular marijuana edibles, which may be found as beverages, gummies, oils, or finely ground powders. Due to the varying concentrations of Δ -9 THC in marijuana edibles, along with the wide variety of matrices in which they can be found, sample preparation and qualitative and quantitative analyses of these samples can range from simple to extremely complex.⁷

New Testing Requirements

Currently, crime laboratories in Texas do not quantitate or provide concentrations of Δ -9 THC for suspected marijuana seizures. In order to meet the new legal requirements moving forward, crime laboratories will be required to procure new, expensive analytical instrumentation and to establish and implement new validated methods, which will allow for the quantitation of Δ -9 THC. Development of analytical methods for quantitation of Δ -9 THC validation includes calibration, specificity, accuracy and precision tests to ensure the instrument is suitable for the analysis of Marijuana samples and products.⁸

Although the GC/MS, which is commonly available in most crime laboratories that conduct analyses on seized drugs in Texas and is a gold standard for marijuana or Δ -9 THC qualitative analysis, there are new scientific considerations that must be addressed when quantitation is necessary. Due to the complex chemistry of marijuana, it contains hundreds of compounds, which include precursors to Δ -9 THC, such as Tetrahydrocannabinolic acid A (THCA-A). However, when THCA-A is heated, it undergoes decarboxylation and converts to Δ -9 THC, which may introduce uncertainty regarding the original concentration of THC vs. THCA-A in the initial unanalyzed sample. This issue would make quantitative analysis using traditional GC/MS methods more difficult, since the sample is introduced to a heated inlet during analysis. Due to the presence of carboxylated precursors in Marijuana samples, one limitation of using GC-MS for quantitative analysis of Δ -9 THC is that the analysis of samples requires sample derivatization or pre-treatment to differentiate

between these precursors that are thermally labile or unstable and the decarboxylated cannabinoids of interest in the sample. This process of derivatization can be expensive and require more time, which may increase analysis times and ultimately contribute to the already voluminous evidence backlogs at many crime laboratories in Texas.

Due to the limitations to using traditional GC-MS or GC-FID analytical instrumentation, the use of liquid chromatographic techniques, such as thin layer chromatography (TLC) coupled with UV Vis spectroscopy, and ultra-high performance liquid chromatography coupled to tandem mass spectrometers (UHPLC-MS/MS) have been suggested by researchers as suitable techniques for quantitation of Δ -9 THC.⁹ Many of these advanced platforms of instrumentation are not currently available in crime laboratories that conduct seized drug analysis in Texas. According to a recent article published in the Houston Chronicle on July 3, 2019, Houston Forensic Science Center CEO, Dr. Peter Stout, stated that he “only knows of one lab-NMS Labs in Pennsylvania- that is accredited in Texas” for the kind of testing needed.¹⁰ This may also require new training and/or credentialing processes for analysts and staff at crime laboratories where Marijuana analysis is performed.

Conclusion

The legalization of Hemp has created an unexpected challenge for the criminal justice system and the crime laboratories. Additionally, District Attorneys across Texas are contemplating their responses moving forward regarding marijuana arrests and prosecutions. District Attorneys in jurisdictions, such as Harris County, Fort Bend County, Bexar County, and Nueces County, have announced that their jurisdictions will no longer prosecute misdemeanor marijuana cases (4 oz. and under) without a laboratory report that can verify a Δ -9 THC > 0.3% in order to meet the new legal requirements.¹¹ Although several counties have agreed not to prosecute misdemeanor cases for Marijuana, there are some counties that will continue with the filing of charges for felony marijuana cases. There has also been speculation that the expected timeframe when laboratories will be equipped to quantify Δ -9 THC levels is approximately 8-12 months.¹² Until prosecutors are able to make the claim beyond a reasonable doubt as to whether a marijuana substance is legal or illegal based on the definition according to the new legal requirements, laboratories will have to play catch up with the new law. Decriminalization backing for marijuana in small amounts (seizure < 4 oz.) has grown throughout Texas. In a recent article published in the U.S. News, the President of the Harris County Criminal Lawyers Association in Houston, stated that his hope is that the problems with testing result in an end to low-level marijuana prosecutions.¹³ Void is the knowledge of how this new legal predicament will ultimately impact those already convicted, pre-trial populations and those who have been ticketed and released under programs, such as Harris County’s Misdemeanor Marijuana Diversion Program (MMDP). Future studies are needed to examine the effects of policies and procedures implemented in order to meet the current State of Texas legal requirements.

Contributors

Jasmine Drake, PhD is a research fellow in the Center for Justice Research and assistant professor in the Department of the Administration of Justice in the Barbara Jordan – Mickey Leland School of Public Affairs at Texas Southern University.

Elycia S. Daniel, M.A. is a doctoral student in the Department of the Administration of Justice in the Barbara Jordan – Mickey Leland School of Public Affairs, a graduate research fellow in the Center for Justice Research at Texas Southern University and a Criminal Justice Instructor at Clark-Atlanta University.

Jennifer W. Bourgeois, M.S. is a doctoral student in the Department of the Administration of Justice in the Barbara Jordan – Mickey Leland School of Public Affairs and graduate research fellow in the Center for Justice Research at Texas Southern University

References

1. ElSohly M, Slade D. Chemical constituents of marijuana: The complex mixture of natural cannabinoids. *Life Sciences*. 2005;78(5):539-548.
2. Brenneisen R. Chemistry and Analysis of Phytocannabinoids and Other Cannabis Constituents. In: Elsohly M, ed. by. *Marijuana and the Cannabinoids*. Forensic Science and Medicine. Totowa, New Jersey: Humana Press; 2007 [accessed 2019 May 31]. p. 17-49. https://link.springer.com/chapter/10.1007/978-1-59259-947-9_2.
3. CFR - Code of Federal Regulations Title 21. [Accessdata.fda.gov](https://www.accessdata.fda.gov). 2019 [accessed 2019 May 31]. <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=1308&showFR=1>
4. State Marijuana Laws in 2019 Map. *Governing.com*. 2019 [accessed 2019 May 31]. <https://www.governing.com/gov-data/safety-justice/state-marijuana-laws-map-medical-recreational.html>
5. Recommended Methods for the Identification and Analysis of Cannabis and Cannabis Products. Vienna: United Nations Office on Drugs and Crime; 2009 [accessed 2019 Jun 1]. https://www.unodc.org/documents/scientific/ST-NAR-40-Ebook_1.pdf
6. HEALTH AND SAFETY CODE CHAPTER 481. TEXAS CONTROLLED SUBSTANCES ACT. [Statutes.capitol.texas.gov](https://statutes.capitol.texas.gov). 2019 [accessed 2019 Jul 7]. <https://statutes.capitol.texas.gov/docs/HS/htm/HS.481.htm>
7. Klein R. Analysis of "Marijuana Edibles"- Food Products Containing Marijuana or Marijuana Extracts- An Overview, Review, and Literature Survey. *Microgram Journal*. 2017 [accessed 2019 Jul 12];14(1-4):9-32. https://www.dea.gov/sites/default/files/pr/microgram-journals/2017/mj14-1_9-32.pdf
8. Welling M, Liu L, Hazekamp A, Dowell A, King G. Developing Robust Standardised Analytical Procedures for Cannabinoid Quantification: Laying the Foundations for an Emerging Cannabis-Based Pharmaceutical Industry. *Medical Cannabis and Cannabinoids*. 2019;2(1):1-13.
9. Klein R. Analysis of Marijuana by Liquid Chromatographic Techniques a Literature Survey, 1990 - 2015. *Microgram*. 2015 [accessed 2019 Jul 12];12(1-4):1-17. https://www.dea.gov/sites/default/files/pr/microgram-journals/2015/mj12-1_1-17.pdf
10. Blakinger, K., & Morris, A. ((2019, July 3). July 3). Texas DAs struggle to weed out hemp rules. *Houston Chronicle*, p . A13.
11. Blakinger K. *Houston Chronicle*. [Houstonchronicle.com](https://www.chron.com/news/houston-texas/article/Four-Texas-DAs-announce-shared-plan-to-stop-14069153.php). 2019 [accessed 2019 Jul 12]. <https://www.chron.com/news/houston-texas/article/Four-Texas-DAs-announce-shared-plan-to-stop-14069153.php>
12. McCullough J, Samuels A. This year, Texas passed a law legalizing hemp. It also has prosecutors dropping hundreds of marijuana cases. *The Texas Tribune*. 2019 [accessed 2019 Jul 12]. <https://www.texastribune.org/2019/07/03/texas-marijuana-hemp-testing-prosecution/>
13. Lozano, J. (2019, July 3). New Texas hemp law causing problems with marijuana cases. *U.S. News & World Report*. 2019 [accessed 2019 Jul 10]. <https://www.usnews.com/news/best-states/texas/articles/2019-07-03/new-texas-hemp-law-causing-problems-with-marijuana-cases>