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Types and Brands of Derived Psychoactive Cannabis Products: An Online Retail Assessment, 2023

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Abstract

Background: The 2018 Farm Bill led to new types of derived psychoactive cannabis products (DPCPs) being sold throughout the United States. This study describes the new types and brands of DPCPs sold online.

Materials and Methods: In May 2023, data were recorded from three top-trafficked U.S.-based DPCP retail websites, including information about each product ($N = 804$).

Results: DPCP modalities included disposable vapes (43%), edibles (29%), vape carts (18%), pre-rolls (7%), flower (2%), dabs (1%), and vape pods (<1%). Among the 118 brands, the most common were Exhale, Delta Extrax, Cake, URB, Looper, and TRE House. There were 26 different intoxicating compounds overall, the most prevalent being: Delta-8 tetrahydrocannabinol (THC), THC-P, Delta-9 THC, HHC, THC-A, Delta-10 THC, THC-H, THC-B, THC-JD, THC-X, HHC-P, and Delta-11 THC. Overall, 54% of products were blends, containing two to eight different intoxicating compounds in a single product.

Discussion: This is the first study to systematically assess DPCPs sold online. Most of the DPCP market is comprised of vapes and edibles, but these products contain a wide array of compounds and blends. Data from this diverse, rapidly evolving market are needed to examine its consumer impact and inform public health policies and programs.

Keywords: cannabinoid; marijuana; marketing; 2018 Agriculture Improvement Act

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Introduction

Derived psychoactive cannabis products (DPCPs) induce a "high" akin to cannabis, but they are chemically created rather than grown.[1] There has been rapid expansion in the U.S. retail availability of DPCPs following the 2018 Farm Bill, which some have interpreted as implicitly legalizing their production and sale.[1] However, there are no federal regulations on product safety nor marketing.[1] This is concerning given that DPCP use associated with numerous public health risks including psychiatric, gastrointestinal, and respiratory problems, as well as injuries and poisonings.[2,3]

Amplifying these concerns is that many brands market their products in ways that appeals to children, as called out by the U.S. Food and Drug Administration.[3] Relatedly, a large proportion of calls to U.S. poison control centers for Delta-8 tetrahydrocannabinol (THC) use is for children.[3] While Delta-8 THC was

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the first DPCP to garner significant attention, it is merely one of numerous intoxicating compounds available.[4] A comprehensive understanding of these intoxicating compounds is crucial to ensure that any legislative or regulatory measures aimed at managing or prohibiting these products are comprehensive and, therefore, effective.

This descriptive study aimed to identify DPCP types and brands, as well as the different intoxicating compounds in DPCPs sold online. The current study focused on online retail for two primary reasons. First, research shows online sales of DPCPs often fall short when it comes to age verification.[5,6] Second, online platforms offer the ability to capture a detailed catalog of the broad range of available products, which would be infeasible to collect in brick-and-mortar establishments.[7]

Materials and Methods

Data source

In May 2023, we utilized Google's search engine in Incognito mode to ensure an expansive capture of online vendors unbiased by search history. The search term "buy delta thc" was determined to provide a breadth of various types of retailers within the results, and the first 100 results were documented to provide reasonable depth.

The current study relied on data from the three websites that sold DPCPs with the highest web traffic, which was determined using the popular digital market intelligence platform Similarweb. Similarweb utilizes advanced data collection methods, including direct measurement from millions of websites and apps, to ensure accurate insights into web traffic.[8] All three companies were U.S. based, as each companies' headquarters were within the United States, and at least 89% of visitors to each site were from within the United States. The websites and the number of corresponding visitors in April 2023 were

Element Vape (elementvape.com): 2.1 million

Premium Delta-8 and CBD (delta8resellers.com): 547,500

Exhale Premium Hemp Products (exhalewell.com): 368,100

Measures

Our team cataloged key attributes of every DPCP sold on each website including product name, brand, modality/form, and the type of intoxicating compound(s) such as Delta-8 THC. Given the diverse range of products available, modalities were categorized as edibles, pre-rolls, flower, dabs, carts, pods, and disposable vapes.

Data collection spanned from May to August 2023 and was overseen by the lead investigator (M.E.R.), assisted by two trained doctoral-level students. Emphasizing accuracy, we implemented a validation step in which a random 5% of the recorded data underwent cross checks, reassuringly yielding no discrepancies in coding. To avoid redundancy, products from the same website were de-duplicated if their only differences lay in flavors, quantity (e.g., 1 g vs. 2 g), or the presence or absence of a battery (for vaping devices).

Analyses

Descriptive statistics and tables were generated using Stata v.17.

Human subjects approval statement

No Institutional Review Board review was necessary because no human participants were involved in this study.

Results

Brands and modalities

After de-duplicating, there were 804 DPCPs from 118 brands. Table 1 displays the top 40 brands, along with the number of available products by modality. Notably, one website (exhalewell.com) sold exclusively Exhale brand products. Most products in the sample were disposable vapes (43%) or edibles (29%), followed by vape carts (18%), pre-rolls (7%), flower (2%), dabs (1%), and vape pods (<1%). As seen in Table 1, brands commonly included products across multiple modalities.

Intoxicating compounds

There were 26 distinct intoxicating compounds included in products (listed in descending order): Delta-8 THC ($n=498$), THC-P ($n=264$), Delta-9 THC ($n=181$), HHC ($n=159$), THC-A ($n=104$), Delta-10 THC ($n=98$), THC-H ($n=78$), THC-B ($n=65$), THC-JD ($n=55$), THC-X ($n=46$), HHC-P ($n=44$), Delta-11 THC ($n=37$), PHC ($n=33$), THC-V ($n=20$), THC-O ($n=17$), Delta-6 THC ($n=16$), THC-M ($n=14$), HHC-O ($n=12$), HXC ($n=7$), HXCp ($n=4$), Delta-9o THC ($n=3$), THCP-O ($n=3$), THD ($n=3$), HHC-R ($n=2$), HXCo ($n=1$), and HCP ($n=1$).

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Table 1. Full Sample and Top 40 Brands: Number of Available Products by Modality

Brand	Total *n*=804	Carts *n*=143	Dabs *n*=8	Disposables *n*=347	Edibles *n*=236	Flower *n*=13	Pods *n*=3	Pre-roll *n*=54
Exhale	41	6	1	8	15	6	—	5
Delta Extrax	40	16	—	14	8	—	—	2
Cake	34	12	—	17	5	—	—	—
URB	33	4	—	10	15	1	—	3
Looper	27	—	—	22	1	—	—	4
TRE House	26	7	—	9	8	—	—	2
Binoid	25	13	—	6	6	—	—	—
ELYXR	25	5	3	6	8	1	—	2
Flying Monkey	23	2	—	10	6	—	—	5
Modus/Medusa	22	2	—	13	5	—	—	2
Mellow Fellow	21	5	—	14	2	—	—	—
Honeyroot	21	8	—	12	1	—	—	—
Maui Labs	20	4	—	3	11	—	—	2
Purlyf	16	5	—	8	3	—	—	—
Torch	14	1	—	7	4	1	—	1
STIIIZY	14	1	—	2	4	—	2	5
HiXotic	14	2	—	8	3	—	—	1
Galaxy Treats	14	1	—	2	11	—	—	—
Kalibloom	12	3	—	9	—	—	—	—
Space Gods	12	—	—	5	7	—	—	—
Wild Orchard	12	2	—	4	4	—	—	2
ZAZA	12	1	—	8	3	—	—	—
Trippy Sugar	12	4	—	3	4	—	—	1
Dimo	11	4	—	2	5	—	—	—
Pacha	11	—	—	11	—	—	—	—
Tyson	10	—	—	2	5	—	—	3
Geek'd	9	—	—	6	3	—	—	—
Ghost	9	—	—	8	1	—	—	—
Hidden Hills	9	2	—	4	2	—	—	1
Ocho Extracts	9	—	—	5	3	—	—	1
Exodus	8	3	—	2	3	—	—	—
HIGH	7	—	—	2	5	—	—	—
Koi	7	—	—	4	3	—	—	—
Packwoods	7	2	—	2	2	1	—	—
Two Hawk	7	—	—	2	5	—	—	—
Astro Eight	6	2	—	4	—	—	—	—
Canna River	6	1	—	1	4	—	—	—
Frozen Fields	6	2	—	2	2	—	—	—
Happi	6	2	—	3	1	—	—	—
Kik	6	—	—	6	—	—	—	—

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Blends

Overall, 54% of products were blends containing two or more intoxicating compounds. This included 52% of carts, 50% of dabs, 67% of disposables, 40% of edibles, 8% of flower, 33% of pods, and 46% of pre-rolls. More than 18% of products contained four or more intoxicating compounds. Having six or more intoxicating compounds was less common (3%). The greatest number of intoxicating compounds contained in a single product was 8 ($n=10$; 6 disposables and 4 edibles), mostly from the brands Ocho Extracts ($n=5$) and Trip Drip ($n=3$).

There were 185 different combinations of intoxicating compounds contained within these 804 products. The most common intoxicating compounds in products with only one intoxicating compound were Delta-8 THC ($n=171$), Delta-9 THC ($n=70$), HHC ($n=68$), THC-A ($n=22$), and Delta-10 THC ($n=20$). The most common combinations of intoxicating compounds in blends were Delta-8 THC and THC-P ($n=38$); Delta-8 THC and Delta-9 THC ($n=18$); Delta-8 THC and Delta-10 THC ($n=15$); Delta-8 THC, HHC, and THC-P ($n=14$); and Delta-8 THC, Delta-10 THC, and THC-P ($n=13$). Although THC-P was in 33% of products ($n=264$), it was rarely the only intoxicating compound in a product ($n=3$).

Discussion

This study systematically assessed the types and brands of DPCPs available for online purchase. The vast array of intoxicating compounds identified underscores the expansive nature of this rapidly evolving market. The emergence of 26 distinct intoxicating compounds within DPCPs underlines the industry's adaptability, including to regulatory challenges and legal loopholes.

Most products were blends, and there were 185 combinations identified. Importantly, there is little understanding of the health effects from using these compounds in these various combinations.

Limitations

This study leveraged digital market intelligence and online retailer data to capture important information about the current DPCP landscape. Data were derived using comprehensive but feasible methods and validated using rigorous quality assurance measures. Nonetheless, this study captures data at one time point and did not assess consumer purchasing or use behaviors. Also, one cannot be sure whether two different THC analogues are indeed distinct or just provided with different nomenclatures. More research and surveillance of these novel compounds are needed.

Public health implications

This study offers a foundational understanding of the current online retail market for DPCPs, demonstrating its diversity, including a range of intoxicating compounds, brands, and product modalities. This quickly diversifying market warrants ongoing surveillance, and future research is needed to examine consumer purchasing and use behaviors. These data are needed to inform policy, public health practice, and research.

Authors Contributions

M.E.R. conceptualized the study, conducted the analyses, and drafted the initial version of the article. K.K.T., V.V., and M.E.R. conducted data collection and management. All authors substantially aided in editing and revising the draft and approved the final version of the article.

Author Disclosure Statement

No competing financial interests exist.

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References

1. LoParco CR, Rossheim ME, Walters ST, et al. Delta-8 tetrahydrocannabinol: A scoping review and commentary. Addiction 2023;118(6):1011–1028; doi: 10.1111/add.16142
2. Leas EC, Harati RM, Satybaldiyeva N, et al. Self-reported adverse events associated with Δ8-tetrahydrocannabinol (delta-8-THC) use. J Cannabis Res 2023;5:15; doi: 10.1186/s42238-023-00191-y
3. U.S. Food and Drug Administration. 5 Things to Know about Delta-8 Tetrahydrocannabinol—Delta-8 THC. FDA; 2022. Available from: https://www.fda.gov/consumers/consumer-updates/5-things-know-about-delta-8-tetrahydrocannabinol-delta-8-thc [Last accessed: November 5, 2023].
4. Rossheim ME, LoParco CR, Henry D, et al. Delta-8, delta-10, HHC, THC-O, THCP, and THCV: What should we call these products? J Stud Alcohol Drugs 2023;84(3):357–360; doi: 10.15288/jsad.23-00008
5. Egan KL, Villani S, Soule EK. Absence of age verification for online purchases of cannabidiol and delta-8: Implications for youth access. J Adolesc Health 2023; doi: 10.1016/j.jadohealth.2023.01.020
6. Nali MC, McMann TJ, Purushothaman V, et al. Assessing characteristics and compliance of online delta-8 tetrahydrocannabinol product sellers. Cannabis Cannabinoid Res 2023; doi: 10.1089/can.2022.0341
7. Rossheim ME, LoParco CR, Walker A, et al. Delta-8 THC retail availability, price, and minimum purchase age. Cannabis Cannabinoid Res 2022; doi: 10.1089/can.2022.0079
8. Similarweb Data Methodology. Available from: https://support.similarweb.com/hc/en-us/articles/360001631538-SimilarWeb-Data-Methodology [Last accessed: November 10, 2023].

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Abbreviations Used

DPCP = derived psychoactive cannabis product
THC = tetrahydrocannabinol

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