



## Cannabis: The Science Behind the Hype

*V. Dharani*<sup>\*1</sup>, *K. Tirumala Naik*<sup>2</sup>, *M. Kishore Babu*<sup>3</sup>, *K. N. Priyadharshini*<sup>4</sup>, *M. Navya Sai*<sup>5</sup>.

<sup>\*1</sup> Pharm. D, Krishna Teja Pharmacy College, Tirupati, Andhra Pradesh.

<sup>2</sup>Associate Professor, Krishna Teja pharmacy College, Tirupati, Andhra Pradesh.

<sup>3</sup>Principal, Krishna Teja pharmacy College, Tirupati, Andhra Pradesh.

<sup>4&5</sup>Pharm.D, Krishna Teja Pharmacy College, Tirupati, Andhra Pradesh.

<sup>4</sup>[knpriya99@gmail.com](mailto:knpriya99@gmail.com), <sup>5</sup>[manerisai4@gmail.com](mailto:manerisai4@gmail.com)

Email id: [veeraballidharani@gmail.com](mailto:veeraballidharani@gmail.com)

### ABSTRACT:

This article provides an overview of the current state of research on cannabis, focusing on its adverse health effects, therapeutic potential, pharmacology, and the endocannabinoid system. It explores scientific evidence from various studies and reviews, shedding light on the potential risks and benefits of cannabis use. The adverse health effects of marijuana use, including cognitive impairment, addiction, impaired driving, respiratory problems, and mental health issues, are discussed. Additionally, the therapeutic potential of cannabis in treating chronic pain, chemotherapy-induced nausea and vomiting, multiple sclerosis-related spasticity, and neuropsychiatric disorders is highlighted. The role of the endocannabinoid system in regulating physiological processes and the interaction between cannabis and the endocannabinoid system are also examined. Furthermore, the pharmacokinetics and pharmacodynamics of cannabinoids, the pharmacological properties of cannabidiol (CBD), and its potential therapeutic role in various conditions are reviewed. The concept of the entourage effect, emphasizing the potential synergistic effects of different compounds in cannabis, is explored. While the findings demonstrate promise, it is emphasized that further research is necessary to fully understand the effects, optimal dosing, and long-term consequences of cannabis use.

**KEYWORDS:** cannabis, marijuana, endocannabinoid system, cannabinoids, cannabidiol (CBD), entourage effect

### INTRODUCTION:

Cannabis, commonly known as marijuana, has been a subject of widespread debate and discussion in recent years. With the ongoing legalization efforts and growing interest in its potential medicinal applications, it is crucial to understand the scientific evidence behind the hype surrounding cannabis<sup>[1]</sup>. This article explores the current state of research on cannabis, shedding light on its adverse health effects, therapeutic potential, pharmacology, and the endocannabinoid system.

#### 1. ADVERSE HEALTH EFFECTS OF MARIJUANA USE :

In a comprehensive study, Volkow et al. (2014) discussed the adverse health effects of marijuana use. The authors highlighted various concerns, including cognitive impairment, addiction, impaired driving, respiratory problems, and mental health issues. It is essential to recognize these potential risks and weigh them against the potential benefits of cannabis use.<sup>[1]</sup>

#### 2. CANNABINOIDS AND CANNABIS' EFFECTS ON HEALTH:

The National Academies of Sciences, Engineering, and Medicine (2017) conducted an extensive review to evaluate the health effects of cannabis and cannabinoids. The report highlighted the therapeutic potential of cannabis in treating chronic pain, chemotherapy-induced nausea and vomiting, and multiple sclerosis-related spasticity. However, it also emphasized the need for further research to better understand the long-term effects of cannabis use.<sup>[2]</sup>

#### 3. THE ENDOCANNABINOID SYSTEM AND THE BRAIN:

Mechoulam and Parker (2013) provided an overview of the endocannabinoid system (ECS) and its role in the brain. The ECS plays a vital role in regulating various physiological processes, including mood, memory, appetite, and pain sensation. Understanding the interaction between cannabis and the ECS is crucial for unraveling the mechanisms underlying the effects of cannabinoids on the brain.<sup>[3]</sup>

#### 4. MEDICAL MARIJUANA FOR TREATMENT OF CHRONIC PAIN AND OTHER MEDICAL AND PSYCHIATRIC PROBLEMS :

Chronic pain management is a major area of interest regarding medical cannabis. Hill (2015) reviewed the current evidence on the use of medical marijuana for chronic pain and other medical and psychiatric conditions. The author discussed the potential benefits of cannabis in pain management, while also acknowledging the need for more rigorous clinical trials to establish its efficacy.<sup>[4]</sup>

#### **5. PHARMACOKINETICS AND PHARMACODYNAMICS OF CANNABINOIDS:**

Grotenhermen (2003) provided a comprehensive review of the pharmacokinetics and pharmacodynamics of cannabinoids. The article discussed the absorption, distribution, metabolism, and elimination of cannabinoids in the body. Understanding these factors is crucial for optimizing the dosing and administration of cannabis-based medications.<sup>[5]</sup>

#### **6. CANNABIDIOL: A CANNABINOID WITH A BROAD SPECTRUM OF ACTION FROM AN INACTIVE CANNABINOID:**

Cannabidiol (CBD), a non-intoxicating compound found in cannabis, has gained significant attention for its potential therapeutic properties. Zuardi (2008) reviewed the pharmacological properties of CBD and its potential role in various neuropsychiatric disorders. The article highlighted the anxiolytic, antipsychotic, and anti-inflammatory properties of CBD, suggesting its potential as a therapeutic agent.<sup>[6]</sup>

#### **7. CANNABIDIOL: PHARMACOLOGY AND POTENTIAL THERAPEUTIC ROLE IN NEUROPSYCHIATRIC DISORDERS, INCLUDING EPILEPSY:**

Devinsky et al. (2014) explored the pharmacology of cannabidiol and its potential therapeutic role in epilepsy and other neuropsychiatric disorders. The authors discussed the anticonvulsant properties of CBD and its potential as an adjunctive treatment for drug-resistant epilepsy. Additionally, CBD showed promise in mitigating symptoms associated with anxiety, schizophrenia, and other psychiatric disorders.<sup>[7]</sup>

#### **8. Taming**

##### **The: Phytocannabinoid-terpenoid entourage effects and potential cannabis synergy**

Russo (2011) discussed the potential synergistic effects between THC (delta-9-tetrahydrocannabinol) and other cannabinoids and terpenoids found in cannabis. The article highlighted the concept of the entourage effect, suggesting that the combination of different compounds in cannabis may produce enhanced therapeutic effects compared to isolated cannabinoids.<sup>[8]</sup>

---

#### **CONCLUSION:**

The scientific exploration of cannabis has advanced significantly in recent years, providing valuable insights into its potential benefits and risks. While cannabis shows promise as a therapeutic agent for various conditions, more research is needed to fully understand its effects, optimal dosing, and long-term consequences. The findings discussed in this article demonstrate the importance of evidence-based research to guide policy decisions and medical practice regarding cannabis use. As further studies emerge, a clearer understanding of cannabis and its potential will continue to evolve, shaping the future of cannabis-related research, medicine, and public health policies.

#### **ACKNOWLEDGEMENT:**

We are very thankful to Dr. K. Tirumala Naik, Pharm. D, Clinical preceptor and Associate professor, Department of pharmacy practice, Krishna Teja Pharmacy College, Tirupati. We sincerely thank him for his immense support and valuable suggestions to complete our article. We are very glad to pursue our article under his guidance.

#### **REFERENCES:**

1. Volkow, N. D., Baler, R. D., Compton, W. M., & Weiss, S. R. (2014). Adverse health effects of marijuana use. *New England Journal of Medicine*, 370(23), 2219-2227.
2. National Academies of Sciences, Engineering, and Medicine. (2017). *The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research*. National Academies Press.
3. Mechoulam, R., & Parker, L. A. (2013). The endocannabinoid system and the brain. *Annual Review of Psychology*, 64, 21-47.
4. Hill, K. P. (2015). Medical marijuana for treatment of chronic pain and other medical and psychiatric problems: A clinical review. *JAMA*, 313(24), 2474-2483.
5. Grotenhermen, F. (2003). Pharmacokinetics and pharmacodynamics of cannabinoids. *Clinical Pharmacokinetics*, 42(4), 327-360.
6. Zuardi, A. W. (2008). Cannabidiol: From an inactive cannabinoid to a drug with wide spectrum of action. *Revista Brasileira de Psiquiatria*, 30(3), 271-280.
7. Devinsky, O., Cilio, M. R., Cross, H., Fernandez-Ruiz, J., French, J., Hill, C., ... & Friedman, D. (2014). Cannabidiol: Pharmacology and potential therapeutic role in epilepsy and other neuropsychiatric disorders. *Epilepsia*, 55(6), 791-802.

8. Russo, E. B. (2011). Taming THC: Potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. *British Journal of Pharmacology*, 163(7), 1344-1364.
9. Lutz, B., Marsicano, G., Maldonado, R., & Hillard, C. J. (2015). The endocannabinoid system in guarding against fear, anxiety and stress. *Nature Reviews Neuroscience*, 16(12), 705-718.
10. Cooper, Z. D., & Haney, M. (2009). Cannabis reinforcement and dependence: Role of the cannabinoid CB1 receptor. *Addiction Biology*, 14(3), 277-289.
11. Pertwee, R. G. (2008). The diverse CB1 and CB2 receptor pharmacology of three plant cannabinoids:  $\Delta^9$ -tetrahydrocannabinol, cannabidiol and  $\Delta^9$ -tetrahydrocannabivarin. *British Journal of Pharmacology*, 153(2), 199-215.
12. Huestis, M. A., Gorelick, D. A., Heishman, S. J., Preston, K. L., Nelson, R. A., Moolchan, E. T., & Frank, R. A. (2001). Blockade of effects of smoked marijuana by the CB1-selective cannabinoid receptor antagonist SR141716. *Archives of General Psychiatry*, 58(4), 322-328.
13. Hazekamp, A., & Grotenhermen, F. (2010). Review on clinical studies with cannabis and cannabinoids 2005-2009. *Cannabinoids*, 5, 1-21.
14. Russo, E. B. (2016). Clinical endocannabinoid deficiency (CECD): Can this concept explain therapeutic benefits of cannabis in migraine, fibromyalgia, irritable bowel syndrome and other treatment-resistant conditions? *Neuro Endocrinology Letters*, 35(3), 198-201.
14. Babalonis, S., Haney, M., & Malcolm, R. J. (2017). Oral cannabidiol does not produce a signal for abuse liability in frequent marijuana smokers. *Drug and Alcohol Dependence*, 172, 9-13.
15. Whiting, P. F., Wolff, R. F., Deshpande, S., Di Nisio, M., Duffy, S., Hernandez, A. V., ... & Kleijnen, J. (2015). Cannabinoids for medical use: A systematic review and meta-analysis. *JAMA*, 313(24), 2456-2473.
17. Rahn, E. J., & Hohmann, A. G. (2009). Cannabinoids as pharmacotherapies for neuropathic pain: From the bench to the bedside. *Neurotherapeutics*, 6(4), 713-737.
18. Pertwee, R. G. (2012). Targeting the endocannabinoid system with cannabinoid receptor agonists: Pharmacological strategies and therapeutic possibilities. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 367(1607), 3353-3363.
19. Hill, M. N., & Gorzalka, B. B. (2009). The endocannabinoid system and the treatment of mood and anxiety disorders. *CNS & Neurological Disorders-Drug Targets*, 8(6), 451-458.
20. Huestis, M. A. (2007). Human cannabinoid pharmacokinetics. *Chemistry & Biodiversity*, 4(8), 1770-1804.