



**POTENTIAL BENEFITS OF A MIRACLE PAIN RELIEVER HERB:
*CANNABIS SATIVA***

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ABSTRACT

Cannabis (Vijaya or Bhang) herbaceous species is widely described in ancient literature worldwide. Cannabis sativa belongs to the Cannabaceae family, kingdom Plantae and order Rosales. According to the texts available, Vijaya is the Kohinoor of herbs as it offers some amazing health benefits. The use of cannabis as a potent part is seen in a wider range of physical and mental conditions. Cannabidiol (CBD) is a natural constituent in cannabis and hemp plants Apart from CBD, CBC (Cannabichromene), CBG (Cannabigerol), CBN (Cannabinol) CBDV (Cannabidivarin), THCV (Tetrahydrocannabivarin), THC (Tetrahydrocannabinol) are other potent phytoconstituents found in Cannabis. In ancient conditions, the usage of cannabis was in use of mixed dosages for treating the anesthetic and antiphlegmatic state of human beings. After broad research on cannabis and cannabinoids, Owing to its medicinally active properties the usage was more exploited in many parts of the world for the betterment of humankind. The resin part of cannabis is widely used by surgeons to perform grafting techniques, incisions of organs and tissues in the human body as a painless chemical. This article is an attempt to explore the positive and negative health effects of Bhang (Cannabis) and its potent active moiety, cannabinoids, and its medical uses in the purview of existing Laws for its regulation and legalization.

Keywords: *Bhang, VIJAYA, Cannabinoid Cannabis, Endocannabinoid system*

INTRODUCTION

During the churning of the ocean when the Halahal was taken by Shiva & the nectar by God even humans demanded for their share as the earth was their land and nectar came out of it. It is then Shiva told them about the potency of the nectar being too high for humans to digest and hence they let a drop of nectar fall on earth for it to become a seed, then a plant. But as it was made from the nectar it

stood out. It had a male & female just like humans and only female could have 'babies' or buds. This plant became very dear to Shiva, although he is known as the destroyer but for a change he created something which even today is associated highly with God.

In certain texts of *Ayurveda RASASHASTRA BHANGA* has been described under *Upavisha Varga* (group of sub-poisonous plants).

Table 1: Systemic classification of Bhangra (*Cannabis sativa*)

Kingdom	Plantae
Subkingdom	Tracheobionta
Superdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Hamamelididae
Order	Urticales
Family	Cannabaceae
Genus	Cannabis
Species	Sativa

Categorization under the *Upavisa- Varga* may be due to reported action on CNS. It's also have been reported in many formulations in different *Samgraha granthas* (Pharmacopoeia), having *Bhangra* as an ingredient. As per *Ayurveda* it having definitive properties which manifests it's miraculous actions, those are mentioned below in **Table 2**.

The therapeutic usage of cannabis was effective from 6th Century BC which slowly but demandingly become a global concern. The identification of delta-9-tetrahydrocannabinol (THC), was serving as a

psychoactive component until the approval of Epidolex which was given as oral solution for the treatment of seizures and severe forms of epilepsy like Lennox-Gastaut syndrome and Dravet syndrome which was more prominent in age group of 2 years to adults.

Cannabis sativa a commonly grown plant gained its importance due to its therapeutic activity and isolation of 104 cannabinoids along with other components including Terpenoids, flavonoids and nitrogenous compounds. The compound 1- tetrahydrocannabinol (THC) was in useage more because of its mechanism as partial agonist for type 1 cannabinoid (CB₁)

receptors. Apart from it the utilization of CBD are seen in various neuroprotective effects prolonging to anti-cancer properties which are still under the experiment by several researches. Cannabidiol (CBD) also shown sedative effects, act as anti-convulsion agent, anti-inflammatory, tranquillizer and anti-emetic, anticarcinogenic compound. Cannabichromene (CBC) shown anti-inflammatory, anticarcinogenic, analgesic effects. Cannabigerol (CBG) is non-psychoactive, anticarcinogenic, fights

bacteria, helps with bone growth. Cannabinol (CBN) is mildly psychoactive, causes drowsiness, reduces spasm. Cannabidivarin (CBDV) is non-psychoactive. Tetrahydrocannabivarin (THCV) is non-psychoactive, antiepileptic. Tetrahydrocannabinol (THC) may reduce pain, aggression and nausea, stimulate appetite. They are the precursors of carboxylic groups like tetrahydrocannabinolic acid [THCA] and cannabidiolic acid (CBDA).

Table 2: Ayurvedic Properties of Bhanga (Rasa panchak)

Rasa (Taste)	Tikta (Bitter)
Guna (Qualities)	Laghu (Light), Teekshna (strong), Vyavayi (spreads in body swiftly)
Vipaka	Katu
Veerya	Ushna (hot potency)
Prabhava	Madaka, Nidrajanaka, Mohakara
Doshaghata	Vata Kapha Shamaka

Table 3: Chemical Compounds Found In Cannabis Plant

NON-PSYCHOACTIVE	PSYCHOACTIVE
CBD, CBDA Relieves anxiety, convulsions, depression, sleep aid, muscle relaxant	THC, THCA Psychotropic, painkiller, anti-microbial
CBG, CBGA Pain killer, muscle relaxant, anti-erythemic analgesic	THCV, THCVA - Anti-obesity, calming aid, anti-bacterial, anti-viral, Immune system
CBC, CBCA Anti-inflammatory, painkiller, treats acid reflux, Anti-depressant	CBN, CBNA - Mild psychotropic may stimulate bone growth, Anesthetic, Analgesic, Anti-anxiety.

Mainly three chemotypes are based on absolute and relative concentrations of THCA and CBDA [1].

ENDOGENOUS CANNABINOID SYSTEM

They are based on arachidonic acid derivatives, which are potent cannabinoid receptors. These are anandamide (N-Arachidonoyl-ethanolamine). The endogenous “endocannabinoids” are seen in minor quantities in our cerebra; system and ~~dr~~ tissues. In certain cases of lipid, mediators they are chemically synthesized which are released on the demand of body need. The human endocannabinoid system (ECS) is a composition including varieties of endogenously produced cannabinoid, which generally affects the enzyme metabolism, and in turn, they alter the action of receptors attached to the cell like CB1 and CB2. The presence of CB1 receptors are predominant in brain and Central Nervous System apart from the neural network. On the other hand CB2 receptors are at much lower levels found and are mainly expressed in peripheral immune cells, tissues, and in haematopoietic cells. Together they belong to the Class of G-protein coupled receptors. The activation is seen on inhibition to adenykate cyclase activity.

Neuroanatomically distribution are seen in mammals in the part of cerebral cortex owing to frontal regions of the skull, basal ganglion

and in cerebellum with higher densities of CB1 Receptors. The position in hypothalamus, in anterior cortex of the brain and hippocampus also has an insight of CB1 Receptor.

Researchers on the basis of *in vitro* studies carried out in animals have found out that the binding capacity of endocannabinoids leads to destruction of various biological functions like formation and storage of memory, their cognitive behavior, mood swings, fertility issues pain junctions, severe cardiovascular effects and lack of immunity.

PHARMACOKINETICS

There are around 400 different substances found in the plant, but the most prevalent is THC. As they have low solubility in lipids and the gut absorption is very slow in case of oral administration whereas on inhalation the reaction time reaches within 30 Sec. and peaks to 1 min lasting its potency till 4 hours. The metabolized part stays in the liver and non-metabolized part which is around 40 to 65 % is excreted in feaces and in urine

PHARMACODYNAMICS

It affects primarily basal ganglia and cerebellum that is responsible for motor performance, hippocampus that regulates memory and prefrontal cortex which maintains attention, memory and concentration. Cannabinoids may lead to sedation and mild to moderate analgesia, which may be limited by partial agonist

action. Antianxiety and anti-aggression; anti-anger, time and sensory distortions, impaired coordination and impaired cognitive functioning. Cannabinoid receptors are usually presynaptic and they inhibit calcium ion flux and facilitate potassium channels, which result in inhibition of release of other transmitters.

Delta 9THC (Central Effects)

Activation of CB1 receptors are also initiated by GABAergic interneurons, which are located in hippocampus, amygdala and central cortex. During the process of activation inhibitions of monoamine and amino acid neurotransmitters are also seen. These transmitters later on helps in the depolarization and induces the suppression caused by the inhibitors or the exciters in cerebellum. Outcomes of the se inhibitors or exciters leads to the process of brain developing in the preclinical part which also affects the social and environmental factors.

POSSIBLE BENEFITS OF CANNABIS IN MEDICAL SCIENCE [2]

It includes Autism [3-5], some stomach disorders, chronic pain [6, 7], nausea [8] and vomiting caused by chemotherapy, glaucoma. It has been seen that patients with complains regarding to bowel disease or Crohn's disease when treated with cannabis has shown a significant relief in their symptoms which is possibly due to the effect of THC and cannabidiol. They in turn helps in restoration of the immune system and helps in gut

functioning for the patients. In response to it the bacterial growth, which leads to inflammation in the intestines, are generally reduced in the effects of cannabis administration. It also act as appetite stimulant in patients with wasting diseases. In certain cases it finds the importance in treating Post Traumatic Stress Disorder (PTSD) [9, 10].

Symptoms of multiple sclerosis. The usage of cannabidiol was seen in cases of healing and strengthen of bones which can be explored in future. Apart from it the usage is seen in the treatment profiling of glaucoma, Alzheimer, various neurological disorders, Cancer, and even in immunodeficiency's [11-16]. Van der Knapp syndrome [17], a rare disorder in which the brain's white matter progressively start vanishing, cannabinoid works positively on that to reverse the condition to normal. CBD oil could cause neuroprotection and neurogenesis in forming of new neurons.

Another impact of cannabidiol was seen in the release of vasopressin and oxytocin which has a positive sign in ASD symptoms. Apart from cannabidiol component, THS shows effects in cases of chronic pain syndromes (visceral pain, such as interstitial cystitis), nausea associated with cancer, antispasmodic (muscle relaxant) secondary to neurological diseases, and to mitigate the side effects of chemotherapy. Peripheral CB2 receptors in heart might be protective against ischemic damage [18].

According to a clinical study of seven months

duration of cannabis exposure, there were no significant changes in the nervous anatomy. The causative factors and pathways of neurodegeneration includes neuroinflammation, microglial cell, oxidative stress, abnormal protein accumulation and neuronal death, cannabinoids are broad spectrum, and modulate all these pathways, therefore of interest in treating diseases that is multi- factorial [19] CB1 receptors normalize excitation(glutamate transmission)in the brain, and may facilitate clearance of abnormal protein. CB2 receptors reduce inflammation and dampen signalling by CB1. Receptor -independent effects to attenuate oxidative stress.

PITFALL OF CANNABIS

Cannabis basic common Psychosocial effects [20]

The brain which helps in triggering our moods, memory, coordination and concentration are due to the effect of THC and these are long term effects which stays in the subconscious part and tiggers when they are in favorable conditions. In case of coordination's which do THC leads to improper posture, balance and reaction time by the brain disrupt. Hence, the process is altered by these receptors which are processed later on and thereby affects the learning capabilities [21, 22].

Effects on behaviour [23] On frequent administration of doses cannabis can lead to effects like intensified reactions, mood

swings, thoughts which are not conscious, possessing lack of attention which may be leading to acute psychosis. These are very common issues related but the fatal can occur if doses are in higher quantities when taken in form of inhalation or by adding them in dietary substances.

Effects on the physical body [24]

Cardiovascular System- Cannabis can cause increase blood pressure and heart rate leading to 20 to 50 beats per minute. This becomes serious when the reaction time gets affected or prolonged even after non consumption of cannabis

Respiratory System-THC is a bronchial dilator initially, then it may constrict. When it is smoked it may impairs lung functions but till now neither no respiratory depression seen nor overdose death.

Reproductive System- May slightly decreases testosterone and female hormone levels but recovery occurs. It can cross placenta barrier and has potential effects on foetus leading to low birth rate [25]. Consumption for a longer period in case of pregnant woman has seen the effects like developing decrease in memory function, hyperactive behaviour. Further experimental studies are necessary to evaluate effects of cannabis in pregnant women and her foetus.

Immune System- No consistent impairment in healthy subjects and there is no evidence that users are more susceptible to infections. Cannabis may cause Orthostatic hypotension,

raising danger from fainting. In some cases, it may also leads to muscle weakness, ataxia and tremor [26].

TOLERANCE AND DEPENDENCE

Tolerance in humans requires high doses and chronic use which last from 4 hours to 12 days in high doses of THC. During this period an increase in “high,” heart rate increase, cognitive and motor impairment, THC produces downregulation and desensitization of cannabis receptors. In view of dependence more frequently described are mild to moderate withdrawal symptoms in about 50-60 percent of regular users who cease use. It is characterized by affective and behavioral symptoms including anxiety, irritability, stomach pain, reduced appetite, reduced food consumption.

DISCUSSION

One hectare of cannabis releases as much oxygen as 25 hectares of forest. Cannabis grows in 4 months and trees grow in 20-50 years [27]. Cannabis plants are radiation traps, and plantations purify the air. Hemp can be grown anywhere in the world, it needs very little water [28]. Furthermore, many countries are as fitting the ban and hemp is coming back a strong crop. The protein value of cannabis seeds is very high and two fatty acids contained in them cannot be found anywhere else in nature. Animals that eat cannabis don't need hormone supplements. Hemp soaps and hemp cosmetics do not pollute water, so they are completely environmentally friendly.

Cannabis was considered an illicit drug for decades. However, in many parts of the world, cannabis has been legalized for medical use or decriminalized for recreational or medical applications. Cannabis legalization in parts of the world appears to have accelerated daily use and related health impacts. Any change in the legal status of cannabis must be undertaken with caution and fully evaluated at each stage to determine the extent to which changes are leading to an increased number of users, over supply and health risk including cannabis-related harm. India is a sleeping giant when it comes to the hemp industry. Some sub clauses of section 8 and Section 10 of the NDPS Act allow every state government to formulate its own laws related to Cannabis cultivation, ware - housing, processing and inter-state export and import. India can be a global leader in the development of Cannabis. Easing of restrictions will promote medical benefits, serve as an alternative treatment for patients, taxes would be generated for useful purposes, individual freedom, purity and safety, guaranteed, regain respect for the law and support cannabis to be a cash crop. In the last century, the sale, cultivation and use of Cannabis was illegal in the majority of countries, but now the global trend of Cannabis has shifted dramatically as in the last few decades, there has been revived support for its decriminalization and legalization for potential therapeutic uses. For better outcomes, clinical trials are conducted

in terms of, preparation methodology of cannabis-based medicines, route of administration, effective dosage, extracting method and pharmaceutical forms. The development of standardized and safe pharmaceutical products has led to developing beliefs in practitioners and the general public in cannabis. For more standardization, pertaining data can also be collected and compiled on adverse reaction of Cannabis use. To avoid misuse of cannabis by wrong doers, Cannabis-based products should strictly be availed on legal prescription and in registered pharmacies

CONCLUSION

Cannabis is the name for all products derived from the plant *cannabis sativa*. The plant has about 540 chemical substances. For cannabis practitioners, the problem begins right with nomenclature. People think that cannabis is the same as marijuana, which is associated with “highs” and hallucinogenic effects. Certain chemical substances from cannabis plants known as cannabinoids are used for medical purposes. The NDPS act bans charas in resin form, ganja flowering or fruiting tops of cannabis plants. There was low acceptance or understanding of medical cannabis in the midst of decades but now the scenario is changing, pan globally. For a country (INDIA) where bhang, a product made from cannabis leaves, has been in use for centuries, knowledge about cannabis’s medical use is extremely low and it should be promoted with

medical cannabis use and appropriate needful training to registered medical practitioners. New techniques are needed to substantiate the traditional and anecdotal data via research. It is estimated that the medical cannabis industry will grow in the billions in India as it has the ability to grow good cannabis. Using our intellect with responsibility can help to bring a better understanding and acceptance of the benefits of herbal cannabis.

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