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Medical Cannabis News and Information

The Cannabis Female Flower

Cannabis sativa L. is an annual herbaceous flowering plant. The term cannabis flower refers to the flowering part of the cannabis plant that can either be male or female. Female flowers usually produce THC and other cannabinoids in higher amounts than the other parts of the plant. The female flowers are fertilized by the male plants to produce cannabis seeds. If left unfertilized, the female flowers continue to produce the resin that contains active cannabinoids until their point of harvest. Female cannabis flowers are tear-shaped with pistils. They do have calyx cells, but not a defined calyx. The female cannabis calyx cells are one part of the perianth, a nearly transparent, delicate tissue that partially encloses the ovule (prospective seed). By definition, a perianth consists of a corolla (brightly coloured petals in other flowering plants) and a calyx. Cannabis flowers are not brightly colored, large, or enticingly fragrant. Each female flower has a single ovule, which is encapsulated by bracteoles and bracts. The bracts and bracteoles are small, modified leaves that enclose and protect the seed. The bracts have the densest covering of capitate-stalked resin glands of any plant part, and it is within the heads of these resin glands that the plant synthesizes and holds the highest concentrations of cannabinoids and terpenes of any plant part. The pistil contains the reproductive parts of a flower, and the two vibrant, hair-like strands of the pistil are called stigmas. Stigmas, the pollen catchers, are “fuzzy” and about 6 to 12 mm long, usually white, and protrude from an ovule. Cannabis plants are wind-pollinated with no need to attract insects or animals to carry the males’ pollen. If a flower is pollinated, the ovule becomes a single fruit, essentially a single seed called an achene. The perianth tightly clasps the seed and usually contains tannins, which give mature seeds their markings or spotted coat.

Cannabis has six kinds of trichomes, originally developed to protect the plant against predators and the elements: three are non-glandular, and three are glandular and resin-bearing.

Cystolith hairs are the most visible of the non-glandular as these needle-like “hairs” prominently cover all of the above-ground plant parts: stems, branches, leaves, petioles and flowers. The other two smaller cystolith hairs with warty bumps and teardrop-shaped trichomes are found mainly on the underside of leaves. The larger cystolith hairs provide defense against insects and likely make the plant less palatable to animals. Cystolith hairs also reflect radiation, reduce water loss, and help to moderate near-surface temperatures.continued on page 2

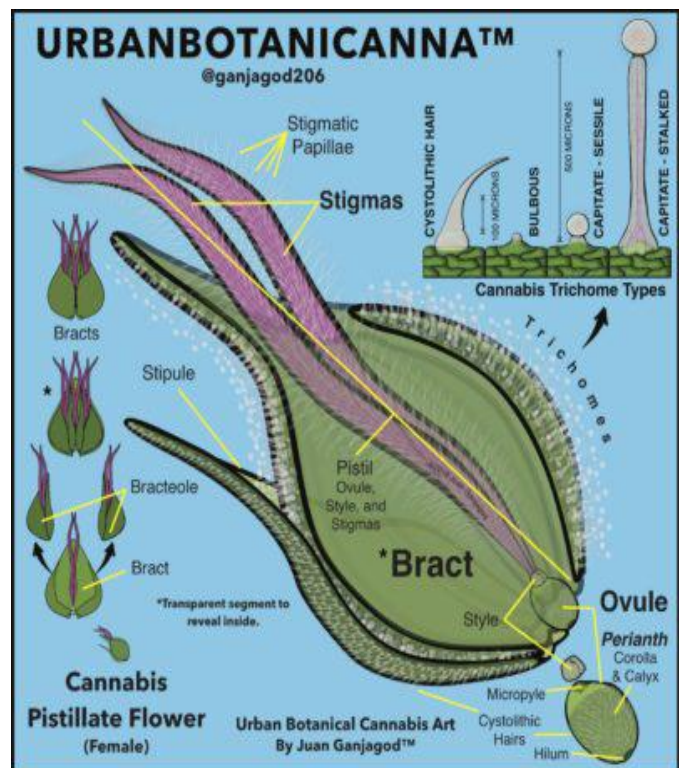


Image: <https://beyondthc.com/wp-content/uploads/2018/11/2-Cannabis-Pistillate-Flower-OShaughnessys-RBG-2-400x400.jpg>

International Association for Cannabinoid Medicines (IACM) Bulletin

Human: Cannabis use is associated with a lower probability of obesity in healthy people

In a representative group for the US population who were followed for 3 years, cannabis use was associated with a lower increase of BMI (body mass index). Researchers of the Department of Family Medicine of Michigan State University in East Lansing, USA, published their research in the *International Journal of Epidemiology*. Adults completed computer-assisted personal interviews on cannabis use, body weight and height at Waves 1 (2001-2002) and 2 (2004-2005). At Wave 2, 77% of the participants never used cannabis, 18% had discontinued use, 3% were initiates and 2% were persistent users. Estimated BMI change over 3 years shows an increase for all subgroups. Compared with never-users, there was an inverse association of cannabis use with obesity and body mass index.

Source: <https://www.ncbi.nlm.nih.gov/pubmed/30879064>

No limit of THC in blood at which a driver is impaired

A new report says Michigan, USA, should not set a legal driving limit for THC in the blood. Set up under former Governor Rick Snyder, a commission made up of six panel members says there should not be a legal limit for THC. Because there is no measurable blood level at which a driver is deemed to be “under the influence of cannabis,” police in Michigan will have to prove a driver is impaired the old fashioned way.

Source: <https://www.wilx.com/content/news/New-report-says-Michigan-shouldnt-set-driving-limit-for-marijuana-507658461.html>

Animal: The CB2 receptor is involved in wound healing of the cornea

In a study with mice, researchers found evidence that the CB2 receptor plays an important role in healing after injury of the cornea and that these receptors are required for the normal course of wound closure.

Source: <https://www.ncbi.nlm.nih.gov/pubmed/30905716>

***The Cannabis Female Flower* ...from pg. 1**

Resin glands synthesize and hold the cannabinoids and terpenes and are of three types: bulbous, capitate-sessile, and capitate-stalked. Hash production depends on these trichomes and their potent sugar-like resin.

Bulbous glands are tiny, are present on the first leaves to form, and are found on stems, branches, leaves, and flowers. Although ubiquitous, their contribution to the overall cannabinoid concentration is insignificant.

Capitate-sessile gland heads are much larger, sit upon a short stalk, which makes them appear stalkless and hence, described as sessile. They likely contribute to the overall cannabinoid concentration due to their larger size and

Human: Cannabis may improve behaviour in patients with dementia according to observational study

Ten female demented patients with severe behavioural problems showed significant improvement after a two-month administration of an oral cannabis extract. Scientists at the Department of Primary Care and Community Medicine of Geneva University Hospitals, Switzerland, published their study results in the journal *Medical Cannabis and Cannabinoids*. Patients received a cannabis tincture which contained a ratio of THC to CBD of 1 to 2. According to the study results they got a mean dose of 8.8 mg THC and 17.6mg CBD after one month, which remained stable after two months (average of 9 mg THC and 18 mg of CBD). Scores of a behavior problem visual analog scale decreased by 40% after 2 months and a rigidity score by 50%. Half of the patients decreased or stopped other psychotropic medications. The staff appreciated the decrease in rigidity, making daily care and transfers easier, the improved direct contact with the patients, the improvement in behavior, and the decrease in constipation with reduced opioid doses. It was well tolerated by patients, and there was no reduction of cannabis for reasons of side effects.

Source: <https://www.karger.com/Article/Abstract/498924>

Animal: A synthetic derivative of CBG improves generation of new nerve cells in the brain

A synthetic derivative of cannabigerol (CBG), called VCE-003.2, improves production of new nerve cells and protected nerve cells in an animal model of Huntington’s disease. **Source:** <https://www.ncbi.nlm.nih.gov/pubmed/30899454>

Human: Haloperidol reduces the psychological effects of THC

In a study with 28 healthy individuals, results “showed that haloperidol did reduce the psychotomimetic (mimics the symptoms of psychosis) effect of delta-9-THC.”

Source: <https://www.ncbi.nlm.nih.gov/pubmed/30919005>

presence on flowers, leaves and petioles.

Capitate-stalked glands are the largest, are the main source of cannabinoid accumulation, and are plainly visible on female flowers. While almost all cells in a cannabis plant are capable of producing minute amounts of cannabinoids, capitate-stalked glands contain at least 50% of the total cannabinoids in a plant. Since female flowers (buds) are the main smokeable product, and buds are the main locus of capitate-stalked glands, these glands are our main source of cannabinoids and terpenes.

Sources: <https://beyondthc.com/the-cannabis-female-flower/>
https://en.wikipedia.org/wiki/Cannabis_sativa
<https://www.leafly.ca/news/cannabis-101/cannabis-anatomy-the-parts-of-the-plant>

Educational Primer on Cannabinoid-Drug Interactions

Drug interactions are a significant consideration in modern medicine. More than half of US adults regularly take prescription meds and at least 75% of Americans take at least one over-the-counter drug. Many people take multiple drugs, and these compounds can interact and affect the metabolism of each other.

Cannabis is one of the most widely consumed substances in the US and throughout the world, and a huge number of cannabis users also consume pharmaceutical products. Given the increasing acceptance and prevalence of cannabis as a therapeutic option, it's important for physicians and patients to understand how various cannabis components, including cannabidiol (CBD) and tetrahydrocannabinol (THC), the major phytocannabinoids, may interact with commonly consumed pharmaceuticals. To that end, Project CBD, a California-based educational non-profit, has published a primer titled *Cannabinoid-Drug Interactions*.

The way cannabinoids are administered (smoking, eating, etc.) has a major impact on whether or not drug interactions occur. Interactions are far more likely when both drugs are taken orally and processed by the liver before being distributed through the body.

Thus far, based on observations regarding the widespread use of raw cannabis flower and full-spectrum cannabis oil, it does not appear that there have been many problems because of cannabinoid-drug interactions. The clinical use of Sativex (a 1:1 CBD:THC sublingual tincture) and Marinol (synthetic THC pill) has resulted in few, if any, reported adverse events attributable specifically to pharmaceutical interactions.

To the extent that there have been problematic drug interactions with cannabinoids, these have involved high doses of nearly pure CBD isolates, not cannabis in general. Even though THC is an intoxicant and CBD is not, the fact that people tend to use much higher doses of pure CBD makes it a much riskier player in metabolic drug interactions. For example, 10 mg of THC can be a hefty dose for a naive patient and sufficiently psychoactive for the occasional recreational user, but doses up to 2000 mg of CBD isolate are not uncommon when used therapeutically.

THC has its own built-in guard rails - consume too much and you'll know you've hit your limit. With CBD, there are no guard rails, no dysphoric feedback loop that says you've had enough. CBD is intrinsically safe, but when extracted from the plant and concentrated as an isolate, high doses are necessary for therapeutic efficacy - unlike whole plant CBD-rich extracts, which have a broader therapeutic window and are effective at lower doses than single-molecule CBD.

Physicians and patients should be concerned about high dose CBD therapy, given that the current regulatory regime privileges CBD isolates over artisanal, whole-plant-derived formulations.

CBD also interacts with THC. By taking CBD and THC together, individuals may find that the effects of THC are tempered but prolonged slightly. It is known that 11-OH-THC is more potent than THC at the CB1 cannabinoid receptor, which mediates psychoactivity. 11-COOH-THC, another THC metabolite, has anti-inflammatory effects without causing a high.

Some people can hardly tolerate any THC. The wide range of reactions to THC-rich cannabis may be influenced by genetic factors. That may be one of the reasons why some people find THC-rich cannabis to be unpleasant, while hundreds of millions smoke it to relax. This genetic variant exists among 20% in European & Middle Eastern populations, meaning one in five Caucasians are THC-averse. < 10% of Africans have this genetic variant and among Asians it's less than 5%. Preclinical research indicates that administering CBD and/or THC in conjunction with first-line chemotherapy drugs could potentiate the latter, thereby reducing the dosage of chemo necessary to treat the cancer. If this indeed translates to human experience, it would be a huge benefit.

Likewise, supplementing an opioid-based pain-management regimen with cannabis could result in lower doses of opioids required for adequate pain relief. Lower doses of opioids will reduce the number of overdose deaths.

A massive consumer demand for CBD products has far outpaced the gathering of clinical data on cannabinoid interactions with pharmaceuticals for pain, cancer, autism, heart disease and many other chronic ailments. A longstanding barrier to research is the US Schedule I status of cannabis, a category reserved for "dangerous substances with no medical value".

Sources: <https://www.projectcbd.org/how-to/cbd-drug-interactions>
https://www.projectcbd.org/sites/projectcbd/files/downloads/cannabinoid-drug-interactions_2018-10-11.pdf



AS A DOCTOR I CAN ONLY SAY THAT ALTHOUGH THE JURY IS OUT REGARDING THE BENEFITS OF CANNABIS SMOKING I CAN SAY WITH CONFIDENCE THAT THIS PARTICULAR SAMPLE WOULD MAKE ONE BITCHIN'SPLIFF

Study Finds That Cannabis May Motivate People to Exercise

Scientific literature examining cannabis use in context of health behaviors, such as exercise engagement, is extremely sparse and has yielded inconsistent findings. This issue is becoming increasingly relevant as cannabis legalization continues.

Physical activity is among the most important health behaviors, but many Americans do not meet minimum exercise recommendations for healthy living. Common issues surrounding low exercise rates include inadequate enjoyment of and motivation to exercise, and poor recovery from exercise.

Researchers at the University of Colorado surveyed more than 600 cannabis users in American states with legal access to assess how people use cannabis in relation to exercise. Their results, published April 2019 in the journal *Frontiers in Public Health*, have found that consuming cannabis may help motivate users to exercise and improve their workouts.

Most people surveyed reported that consuming cannabis before or after exercising improves the experience and aids in recovery. And those who do use cannabis to elevate their workout tend to get a healthier amount of exercise.

The results indicated that the majority (81.7%) of participants endorsed using cannabis concurrently with exercise, and those who did tended to be younger and more likely to be males. Even after controlling for these differences, co-users reported engaging in more minutes of aerobic and anaerobic exercise per week. Specifically, those who engaged in co-use worked out an average of 43 minutes longer for aerobic exercise and 30 minutes longer for anaerobic exercise.

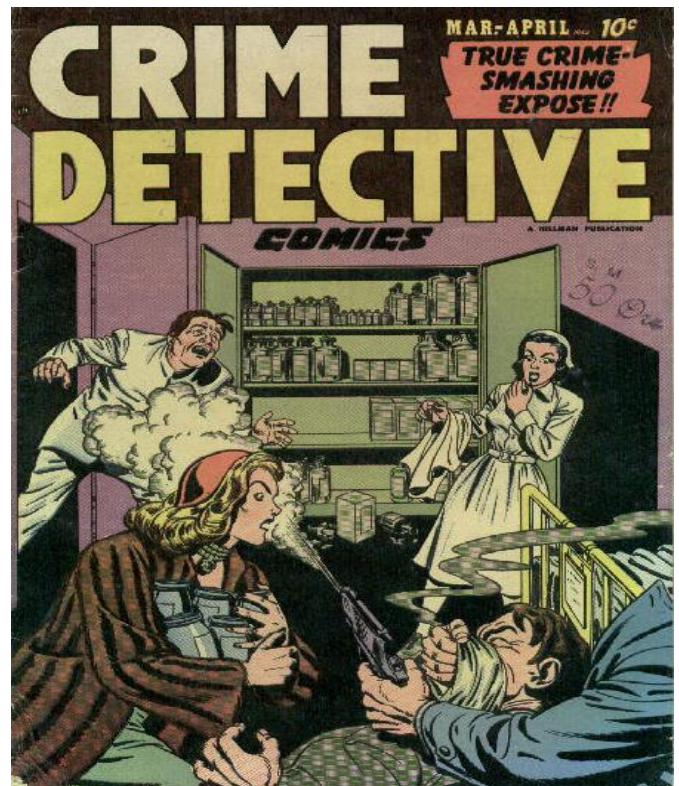
In addition, the majority of participants who endorsed using cannabis shortly before/after exercise reported that doing so enhances their enjoyment of exercise (70%) and recovery from exercise (78%), and just over 50%

reported that it increases their motivation to exercise. “To our knowledge, this is the first study to survey attitudes and behavior regarding the use of cannabis before and after exercise, and to examine differences between cannabis users who engage in co-use, compared to those who do not,” the study authors wrote.

“This study represents an important step in clarifying cannabis use with exercise among adult users in states with legal cannabis markets, and provides guidance for future research directions,” the study concludes.

Sources: <https://www.thegrowthop.com/cannabis-health/cannabis-doesnt-make-you-a-lazy-pothead-in-fact-it-might-actually-motivate-you-to-workout-study>

www.frontiersin.org/articles/10.3389/fpubh.2019.00099/abstract



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Drug Policy Alliance
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www.mapinc.org

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“Law and order exist for the purpose of establishing justice, and when they fail in this purpose they become the dangerously structured dams that block the flow of social progress.”

-- Martin Luther King Jr.