

High Beauty | Going Beyond CBD in Cannabis-Based Skincare

Executive Summary

Cannabis-based skincare products have increased in popularity and permeated the beauty industry. Consumers now have access to products containing THC (delta-9-tetrahydrocannabinol) and CBD (Cannabidiol) that advertise a variety of skin benefits. While CBD may offer health benefits, there are a number of problems facing the CBD industry. The unclear legal status has resulted in a lack of regulation and quality control. In addition, some companies use harmful chemical solvents to extract CBD oil. However, there is an alternative. *Cannabis sativa* seed oil is made by cold pressing *Cannabis sativa* seeds that are free of THC and CBD. These products offer the benefits of *Cannabis sativa* without the same issues facing THC and CBD products. *Cannabis sativa* seed oil is composed of vitamins, minerals, and polyunsaturated fatty acids that are essential for skin health. The seed oil demonstrates moisturizing, anti-inflammatory, and anti-aging properties on the skin. Consumers should consider purchasing products with *Cannabis sativa* seed oil if they want to experience the full benefits of cannabis-based skincare.

Introduction

The cannabis industry has reached a new frontier with more states legalizing medicinal and recreational use. Cannabis companies now have a wider audience and are offering more products than ever before. Cannabis-based products are becoming more mainstream and gaining popularity in large markets such as the beauty industry. Products containing THC and CBD oil have captured attention, but consumers face an overwhelming number of options. With so many new products and formulations available, consumers should educate themselves on cannabis-based products so that they understand which products may be best for them. However, there are also cannabis product options that consumers may not be aware of. The cannabis skincare industry is not limited to the benefits of THC and CBD, there are companies that go beyond these ingredients and offer products that deliver the benefits of the cannabis plant without the quality and regulatory issues associated with THC and CBD.

The Controversial THC Molecule

When most people think of *Cannabis sativa* (*C. sativa*) they are probably thinking of the psychoactive plant that contains THC. However, the species *Cannabis sativa* includes both non-psychoactive hemp plants and the controversial drug marijuana. Over 60 different cannabinoids have been discovered in *Cannabis sativa*.¹ Cannabinoid delta-9-tetrahydrocannabinol (THC) is responsible for the 'high' that people feel when they use cannabis products. The compound Cannabidiol (CBD) is found in marijuana but is also found in higher concentrations in hemp plants. CBD is

not psychoactive, but it does affect the parasympathetic nervous system, producing anti-anxiety, anti-inflammatory, and anti-psychotic effects.¹

In recent years, cannabis-based products have grown in popularity and permeated the market. In the beauty industry, we have seen cannabis-based skincare and makeup products appearing on store shelves and online. Some products contain THC and CBD in the form of cannabis oil extracted from the leaves, stems, and flowers of the plant. However, many people do not realize that there are also cannabis-based skincare products that do not contain THC and CBD. This paper will summarize the effects of cannabis skincare products and the untapped potential of products that go beyond the popular molecule CBD.

When people use cannabis the cannabinoid molecules interact with our body through special receptors. Cannabinoid receptors are found throughout the body as part of the endocannabinoid system. Our skin is part of the endocannabinoid system because it contains CB1 and CB2 receptors that interact with cannabinoids.² Dysfunction of the endocannabinoid system has been linked to skin disorders such as atopic dermatitis, psoriasis, scleroderma, and skin cancer.² The endocannabinoid system is involved in many parts of healthy skin function, such as regulating cell growth, cell survival, immune system and inflammatory responses.² Many cannabis based skincare brands formulate products that contain THC or CBD. When applied topically, these molecules permeate the skin and stimulate the endocannabinoid system.

What is CBD and what does it do?

There has been increasing interest in CBD, one of the main cannabinoids present in cannabis plants. CBD interacts with the skin's endocannabinoid system through CB1 and CB2 receptors. Skincare products such as lotions, serums, moisturizers, and salves containing CBD advertise beneficial skin effects. However, when looking for cannabis skincare products, consumers should consider the following points.

CBD Legality and Safety

CBD products face both legal and regulatory problems. There are varying levels of legality of CBD at the federal and state levels. Cannabis is classified as a Schedule I drug under the Controlled Substances Act. Up until recently, CBD products were illegal under the Controlled Substances Act because CBD is considered a component or derivative of cannabis.³ Under the 2018 Farm Bill, hemp plants and products derived from it are excluded from being a Schedule I drug. However, this does not mean that CBD products are automatically legal. CBD products derived from hemp are only legal if their production follows the Farm Bill law. This means that the hemp has to be grown by a licensed grower who is following both federal and state regulations. So, while more CBD products are now considered legal and may be easier to obtain, that does not mean that all CBD products are produced and sold legally. All products that contain THC are still federally illegal even in states that have legalized cannabis for medical or recreational use.⁴

In addition to the legal issues, the Food and Drug Administration (FDA) has issued warnings to CBD companies in the past, and still continues to express concern. In December 2018, the FDA reinforced its stance by warning the public that cannabis products being marketed with therapeutic or medicinal benefits need to be approved first. They also stated that it is still illegal to market CBD or THC products as dietary supplements. However, some products derived from hemp that do not contain CBD or THC are legal. The FDA has given an official Generally Recognized as Safe (GRAS) notice to hulled hemp (*Cannabis sativa*) seeds, hemp seed protein, and hemp seed oil. ⁵

With the unclear legal standing of CBD and the variation in state and federal laws, CBD products have not been well regulated. One study analyzed eighty-four different CBD products for the concentrations of CBD and THC. Results found that 42% of products contained more than the labeled amount of CBD, 26% contained less CBD, and 31% were accurately labeled. THC was detected in eighteen samples that claimed to be THC free.⁶ A European study also found similar issues, with nine out of fourteen samples of CBD oils containing concentrations of CBD that were different than the labels. ⁷ The lack of regulation and quality of CBD oil is a problem. Consumers should be aware that products may contain varying amounts of CBD, and some may even contain THC. This also makes it difficult for consumers to know if they are taking an accurate dosage of these products. While high quality products do exist, there is no way for people to know for sure what they are buying unless a brand has been evaluated with laboratory testing.

CBD Extraction

Aside from the inconsistency in CBD concentrations, consumers should also be aware of the methods used to create the extracts. Some products are created by using chemical solvents that may be harmful to human health. There are various methods for CBD oil extraction. Some methods use relatively safe organic solvents, while others use more harmful chemicals or super-critical fluids.⁸ Solvents such as olive oil and alcohol (methanol/ethanol) pose less of a threat compared to solvents such as naphtha and petroleum ether. Both of the latter are hydrocarbon solvents that are considered harmful, flammable, and potential carcinogens.⁹ One study analyzed extracts made using naphtha and petroleum ether for quality and purity and found that residual solvents were present in the extracts.¹⁰

Other methods of extraction involve using super-critical fluids that are often heated to high temperatures. The safety depends on the solvent used; popular ones include propane, butane and carbon dioxide. Carbon dioxide extraction is generally considered to be a safe and effective method. However, using cheaper alternatives such as butane and propane raise concerns about the safety and toxicity.¹⁰

While it is important for consumers to think about how their CBD products are made, it might be difficult for them to find this information, as brands are often not transparent about their extraction methods, and likely do not even know.

While CBD can have numerous benefits, consumers should be aware of the legal, quality control, and extraction issues that are dependent on how a product was made and who it was made by. The uncertain legality and lack of regulation has resulted in a wide range of CBD products with various levels of quality. There are

no standards to govern quality or purity. Consumers should consider these factors when looking to purchase CBD products.

Cannabis sativa seed oil

As mentioned earlier, *Cannabis sativa* includes both the psychoactive plant that contains THC and the low THC variety known as hemp. *Cannabis sativa* seed oil is produced by cold pressing *Cannabis sativa* seeds. The seeds are pressed under a very high pressure to extract the oil. This is different from how CBD is extracted from plants. CBD is either extracted as a full spectrum oil that contains other cannabinoids and compounds, or as an isolate, which is then added to another carrier oil or product. When CBD isolate is extracted, there can still be residual traces of harmful solvent chemicals.¹⁰ Contrary to the extraction of CBD oil, cold pressing does not use any chemicals or solvents.

When selecting a product to use on the skin, the user must consider the benefits they are looking for. CBD is being studied for a number of clinical benefits including treatment of anxiety disorder and multiple sclerosis. In June 2018 the FDA approved Epidiolex (cannabidiol) [CBD] oral solution for the treatment of seizures associated with two rare and severe forms of epilepsy, Lennox-Gastaut syndrome and Dravet syndrome, in patients two years of age and older. This is the first FDA-approved drug that contains a purified drug substance derived from marijuana.

CBD extract on its own offers very few direct skin benefits compared to *Cannabis sativa* seed oil. The seed oil is rich in nutrients and has moisturizing and antioxidant properties that CBD does not deliver on its own. CBD extract must be added back into another product to be delivered or applied to the skin. *Cannabis*

sativa seed oil remains pure from the cold pressing process that does not utilize solvents. The seed oil contains all of the fatty acids, vitamins and minerals of the seed and does not need to be mixed with other oils or chemicals to deliver its benefits.

Cannabis sativa seeds do not contain THC or CBD when the seed oil is properly extracted and stored.^{11, 12} These compounds are usually only found in the seed oil if it was contaminated during the pressing process.¹² *Cannabis sativa* seed oil has been studied for years because of its high nutritional value and potential health benefits. Many consumers are unaware that seed oil exists, and even less aware of the positive effects that the seed oil exhibits. It can be incorporated into the diet or applied topically for a variety of health benefits.

In order to understand the benefits of *Cannabis sativa* seed oil, we should look at its composition. *Cannabis sativa* seeds are composed of oils, proteins, vitamins and minerals. The seed oil is rich in polyunsaturated fatty acids, specifically omega-3 (*alpha*-linolenic acid) and omega-6 (linoleic acid), which are essential fatty acids that play an important role in human health. The ratio of omega-6 to omega-3 fatty acids is between 2:1 and 3:1. This ratio is optimal for human health and is not found in other common oils.¹³ The oil also contains gamma-linolenic acid (GLA) and stearidonic acid, which are less commonly found in seed oils and also offer health benefits.¹³ The unique profile of *Cannabis sativa* seed oil offers skin and health benefits for its users. *Cannabis sativa* seed oil has a rich nutrient profile that is superior to other oils used in the cosmetic industry. Popular beauty oils such as argan oil may have high amounts of oleic acid and other nutrients, but *Cannabis*

sativa seed oil has a unique abundance of polyunsaturated fatty acids that no other oil can compare to. *Cannabis sativa* seed oil contains over 80% of polyunsaturated fatty acids, with high levels of both Linoleic and alpha-Linolenic acid, whereas other common oils contain much less, as is shown in the table below.

Fatty Acid Profile of Cannabis Sativa Seed Oil Compared to Other Oils

	Palmitic Acid	Stearic Acid	Oleic Acid	Linoleic Acid	alpha- Linolenic acid	PUFA
	(%)					
Cannabis Sativa Seed Oil ^a	5	2	9	56	22	84
Argan Oil ^b	13	6	46	35	<1	35
Olive Oil ^a	15	0	76	8	<1	8
Avocado Oil ^b	16	2	61	15	1	15.5

PUFA=Polyunsaturated Fatty Acid

a ¹³Callaway (2004)

b ²⁰Rueda et. al (2014)

Our skin contains a lipid barrier that functions as a protective layer. The lipid barrier keeps moisture in and protects our skin from the environment by keeping irritants out. Because of its protective function, the lipid barrier is impermeable to many substances, and it can be difficult for creams or lotions to fully absorb. Fatty acids are needed for cell membrane formation and molecular function.¹⁴ Essential fatty acids, particularly omega-3, have also been shown to reduce inflammation and play an important role in maintaining the skin's moisture barrier.¹⁵ *Cannabis sativa* seed oil is able to deliver these health benefits because fatty acids are easily absorbed through the skin. For years, researchers have explored using fatty acids to enhance the absorption of topical skin medications because fatty acids are able to permeate the skin's lipid barrier.¹⁶ The excellent absorption of *Cannabis sativa* seed

oil is a benefit of its rich polyunsaturated fatty acid composition, that is much higher than in any other seed oil.

Studies have also found that *Cannabis sativa* seed oil can improve certain skin conditions. One study found that patients suffering from atopic dermatitis experienced an improvement in symptoms when incorporating cannabis seed oil into their diets. They not only experienced less dryness and itching, but tests showed an increase in plasma fatty acids.¹⁷ Dietary and topical application of products containing cannabis seed oil may deliver these anti-inflammatory, moisturizing effects because 80% of the seed oil is composed of polyunsaturated fatty acids.¹⁴

In addition to the rich amount of polyunsaturated fatty acids, the seeds contain other beneficial bioactive compounds. The seed oil is also rich in Vitamin E and protein. The two main seed proteins, albumin and edestin, contain all twenty amino acids.¹³ Cannabis seeds have antioxidant properties that come from their composition of polyphenyls, flavonoids, and flavonols. One study found a significant linear relationship between the concentration of polyphenols and antioxidant activity, meaning that higher amounts of polyphenols were associated with more antioxidant activity in red blood cells.¹⁸ Antioxidants are important for the skin because they protect against free radicals and oxidative cellular damage. Another study found that the antioxidant activity in cannabis seed extracts was higher compared to flaxseed, grape seed, and soybean extracts.¹⁹ Therefore, due to antioxidant activity, cannabis seed extracts may be helpful for fighting against skin damage and signs of aging.

Conclusions:

Cannabis sativa seed oil has numerous skin and health benefits. Its composition of fatty acids, vitamins, minerals, and proteins are important for optimizing skin health. Its unique profile and high concentration of polyunsaturated fatty acids, including high levels of omega-3 and omega-6, provide moisture and cellular support to the skin. Bioactive compounds that generate antioxidant activity fight free radicals and oxidative damage to help combat signs of skin aging. In addition, *Cannabis sativa* seed oil is extracted through a safe cold pressing process without the use of any chemicals or solvents. The FDA considers *Cannabis sativa* seed oils safe, and they are legal. When considering cannabis-based skincare options, people should consider finding products that contain *Cannabis sativa* seed oil if they are looking to harness the power of nature to improve skin health, moisturize, reduce inflammation, and fight signs of aging.

Consumer Buying Guide (could be formatted in nice infographic and we can revise it to be more or less detailed)

What is *Cannabis sativa*?

Cannabis sativa is the name of a plant species that includes both the high THC variety, often referred to as 'marijuana' and the low THC variety sometime called 'hemp'. Both plants are considered *Cannabis sativa*.

What ingredients come from these plants?

Cannabis Oil

What is it? Cannabis oil can refer to any type of oil made from various parts of cannabis plants, such as the flowers, stems, and leaves. Depending on what part of the plant was used, cannabis oils will contain different concentrations of THC or CBD.

Where do I buy it? You will most likely find these oils, extracts, or tinctures at cannabis dispensaries if they contain THC.

CBD Oil

What is it? CBD oil is made from cannabis plants with very low levels (less than 0.3%) of THC. CBD is another common cannabinoid that has potential health benefits. CBD oil has become very popular recently, and is available in many forms and different types of products.

Where do I buy it? CBD products are more available than products that contain THC. While dispensaries may sell CBD oils and products, they can sometimes also be purchased at health food stores or other locations. It may also vary depending on the state you live in.

Cannabis Seed Oil

What is it? Cannabis seed oil is made by cold-pressing the seeds of cannabis plants, instead of using flowers or other parts to extract oil. These seeds do not contain THC or CBD.

Where do I buy it? Cannabis seed oil products are more widely available than THC or CBD products, but many consumers remain unaware. Products might also be labeled as “Hemp seed oil” but they are still derived from *Cannabis sativa* seeds.

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