Cannabinoid Report: Acids and Varins

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The cannabinoid acids are the precursor cannabinoids that eventually produce the active, non-acidic cannabinoids (CBG, THC, CBD, etc.) When the cannabis plant is still growing, cannabinoids typically exist only in their acidic forms. Only after the decarboxylation process takes place (usually a result of heating or time) do the cannabinoids become "activated."

Varin cannabinoids (CBGV, THCV, CBDV, etc.) are derived from parent varin acids (CBGV-A, THCV-A, CBDV-A, etc.) and are homologous to their non-varin counterparts. Cannabinoids have side-chains made up of five carbon atoms, whereas varin cannabinoids have side-chains made up of three carbon atoms. Cannabinoid acids (including varins) have no psychoactive effect until being matured and activated through decarboxylation, though they may be medically beneficial before decarboxylation.

Once the cannabis plant has been harvested, partial decarboxylation can occur from having been dried and cured. Instantaneous decarboxylation occurs when the plant is smoked or vaporized. Edible forms of cannabis are especially potent due to the extreme decarboxylation that occurs from the high temperatures from cooking.

Cannabigerolic acid (CBGA)

CBGA is considered to be the "parent cannabinoid." When CBGA is exposed to cannabis's enzymes, THCA synthase, CBDA synthase, and CBCA synthase, CBGA then converts into the major acids, THCA, CBDA, and CBCA, respectively. When CBGA is exposed to heat, it converts into the active cannabinoid CBG. Because CBGA converts into so many other compounds, there is usually only a small percentage of the active CBG cannabinoid found in any given cannabis plant.

Cannabigerovarin (CBGV) and Cannabigerovarinic acid (CBGV-A)

Like CBGA, CBGV-A is another precursor cannabinoid. CBGV-A produces cannabigerovarin (CBGV) through decarboxylation. CBGV-A also produces other varin acids such as THCV-A, CBDV-A, and CBCV-A.

Although CBGV is not psychoactive, it is considered to be a very promising cannabinoid in terms of its therapeutic effects. CBGV may have potent anti-inflammatory effects and may even be effective in treating cancer. CBGV is believed to enhance the effects of THC as well as help CBD bind to the body's cannabinoid receptors.

Tetrahydrocannabinolic acid (THCA)

THC acids include THCA-A, THCA-B, and THCA-C4. After being produced by CBGA, THCA eventually converts into THC through decarboxylation. Because THC eventually produces CBN via air exposure, CBGA is the indirect parent of CBN as well. Although THC is the major psychoactive component of cannabis, its acidic parent does not interact with the body's CB1 or CB2 receptors, and thus has no psychoactive effects.

Despite its lack of psychoactive effects, THCA may have some therapeutic effects. One study determined that THCA, along with a lineup of other cannabinoids, were all effective in reducing inflammation. Other studies showed that THCA displays neuroprotective properties and that it can be extremely effective in reducing nausea and vomiting in rats.

Tetrahydrocannabivarin (THCV) and Tetrahydrocannabivarinic acid (THCV-A)

THCV-A is derived from CBGV-A and eventually produces THCV. While THCV bears a similar molecular structure to that of THC, it produces different effects. 2009 research shows that, in lower doses, THCV acts as CB1 receptor antagonist; however, when higher doses were administered, THCV conversely acted as a CB1 receptor agonist. This is to say that THCV can be both psychoactive and non-psychoactive. THCV also interacts with the body's CB2 receptor.

Multiple studies (2010 and 2014) show that THCV is an effective anti-inflammatory agent, and that THCV may also be effective in reducing gastrointestinal inflammation. Another study found that THCV could be

effective in treating glucose intolerance for diabetic patients. THCV has also been able to significantly reduce seizure activity in rats.

Cannabidiolic acid (CBDA)

CBDA is produced by CBGA and converts into CBD through heat exposure. CBD eventually produces the cannabinoid CBE. Although CBDA does not interact with the body's CB1 and CB2 receptors, CBDA still possesses an array of medical benefits. One study showed that CBDA was significantly more effective than CBD in reducing nausea and vomiting and rats. Another study displayed the significant anti-inflammatory effects of CBDA. An especially intriguing finding determined that CBDA even inhibits migration and proliferation of breast cancer cells.

Cannabidivarin (CBDV) and Cannabidivarinic acid (CBDV-A)

CBDV-A is produced by CBGV-A and eventually produces CBDV. Like CBD, CBDV is not psychoactive but still has many potential medical benefits. CBDV can significantly reduce seizure activity and may be effective in reducing nausea. GW Pharmaceuticals is currently researching CBDV as a potential treatment for epilepsy. CBDV has also been found to be an effective anti-inflammatory agent.

Cannabichromenic acid (CBCA)

CBCA is also produced by CBGA, and then converts into the active cannabinoid CBC. Through light exposure, CBC then produces CBL. Although CBCA eventually produces CBC, the acidic form is actually more commonly found within cannabis plants.

Although many studies have been done regarding the medical benefits of CBC, there is very little known about the benefits of its acidic parent. Many acidic cannabinoids are known to have antibacterial or insecticidal effects, but this may or may not be true of CBCA. Some sources say that CBCA may have anti-inflammatory and anti-bacterial properties, but there are no academic sources to substantiate these claims.

Cannabichromevarin (CBCV) and Cannabichromevarinic acid (CBCV-A)

CBCV-A and CBCV were first reported in scientific literature in 1980. CBCV-A is derived from CBGV-A and then produces the non-psychoactive cannabinoid CBCV. Because CBC has therapeutic properties, it is possible that CBCV does as well, although very little research has been done to support this notion.

Cannabielsoic acid (CBEA)

There are three known CBE acids: CBEA-A, CBEA-B, and CBEA-C. They are all formed from either CBD or CBDA through the process of photo-oxidation or pyrolysis. As of now, there is nothing known about the medical benefits of any of the CBE acids.

Cannabicyclolic acid (CBLA)

CBLA is produced by photochemical conversion from CBCA. CBLA is not abundant within cannabis plants, but it is found in higher concentrations when the plant is harvested during the vegetative stage as opposed to during the reproductive phase. Some sources say that CBLA contains anti-inflammatory and anti-tumor properties, but there are no academic sources to prove these claims.

Cannabicyclovarin (CBLV)

CBLV was first detected in 1972 and is produced by CBCV during irradiation. Like CBL, very little is known about the therapeutic effects of CBLV.

Cannabinolic acid (CBNA)

CBNA is a derivative of THCA. Although CBNA does produce CBN, most CBN is derived from THC. There are many studies that suggest CBN possesses therapeutic benefits, but little is known regarding the beneficial effects of CBNA.

Cannabivarin (CBV)

CBV is CBN's varin homologue and is produced by THCV via oxidation. Like CBN, CBV is also a non-psychoactive cannabinoid. Although there are some studies about the medical benefits of CBN, there are very few about those of CBV.