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THE LOST ART OF THE HASHISHIN

The Workshop: Part 1

Ghetto Bird Trichome
@dynasty_genetics

Science & Traditions

I have had a lot of experience with various sieving devices and methodologies to collect Cannabis resin from dried and cured material. I have also acquired extensive knowledge on collecting live resin from plants at the peak of their flowering cycle. I have worked alongside local Hashishins for months at a time in a few producing regions of the world which gave me the opportunity to see and consume a large sampling of diverse and varied qualities of resin from country to country. I have experienced the benefits of pressing resin into hashish for far too many years, I have seen resin transform for the better over time too often, and I have smoked enough aged Hashish and Charas to come to deeply respect the traditional knowledge and methodology of people in these producing countries.

By Frenchy Cannoli

Traditional knowledge is intrinsic, and questions were answered with the most basic explanation - to give you an example the process of drying and curing plants over months is considered vital to the enhancement of the resin, and pressing the resin with a source of heat in the full sun is believed to create stronger Hashish. Such vital elements to resin quality born from generations of expertise are simply stated as facts, and that is all there is to it.

I never had the chance to study Cannabis and its resin during my travel in producing countries. There was a total lack of available science at that time, and there was no source of information outside the traditional knowledge local Hashishins would share in the most rudimentary form. I did not even have the proper name for the resin I was collecting; trichomes were called pollen in producing countries. I had an extensive knowledge of dry sieving and hand-rubbing live resin, but I was totally ignorant of the most important element of the trade I had practiced for over 20 years in multiple countries. I never thought much about making Hash during my travels outside the necessity to go to extremes to be able to access the highest quality in the best regions of the world, enjoying the process and the culture as I lived among them. I definitely did not consider it a craft at the time. I was young, adventurous, clueless and while I was totally dedicated to the collection of the purest form of Cannabis resin I had not acquired the wisdom and knowledge necessary to understand and appreciate the depth of what was then a most cherished pastime.

Today, I consider myself a craftsman, and as such there are two elements that rule my life, (not counting Madame Cannoli), the Cannabis resin I work with and the tools I use to collect and press the resin. The material you work with defines the tools you use, and as such a deep knowledge of trichome formation, development and function is mandatory to mastery, but more importantly, it will unveil the magic of this unique gift from Mother Nature.

The resin within the trichomes we collect is the bibliography of the plant's life: the Book of the Hashishin.

THE TRICHOMES

Trichomes are an epidermal protuberance covering the leaves, bracts, and stems of plants, the vast diversity of trichomes expressed by the plant kingdom can be loosely classified in two types: the non-glandular trichomes and the glandular trichomes. The non-glandular trichomes can best be described as the plant's hair while the glandular trichomes are made of a spherical roundish structure supported by a stalk which produces and stores around 200,000 organic compounds, the secondary metabolite. The formation of these compounds is not related to the growth, development or reproduction of the plant, like the cannabinoids and terpenes in Cannabis, they are the chemical defense and survival tools of the plant kingdom adapting to an ever-changing environment. The plant kingdom has been producing glandular trichomes for over 300 million years[1] and has been studied since the birth of the microscope in the mid 17th century; nonetheless, we are still mostly guessing when it comes to their functions and role today.

The Cannabis plant has two types of non-glandular trichomes and three types of glandular-trichomes.

The non-glandular simple unicellular and cystolythic trichomes can be seen soon after germination, and develop mostly on the underside of leaves during the plant life cycle. These trichomes protect the plant from extreme temperatures and help retain moisture but they also are abrasive and as such act as a potential deterrent to herbivores.

The Bulbous trichomes are the smallest; they are made of a two-celled stalk and a small glandular head with a diameter of only 10 to 20 microns. They do not produce cannabinoids, and their function is not known.

The Capitate Sessille trichomes are made of a stalk so small it is hard to discern and a glandular head with a diameter of 50 microns and over. These trichomes produce cannabinoids, and their function is thought to be a protection against herbivores.

The Capitate Stalked trichomes are made of a multi-cellular stalk at full maturity surmounted by a glandular head similar to the Capitate Sessille but twice the diameter and height times the volume. They are mostly produced on the floral bracts of the female plant. The Capitate Stalked trichomes produce more cannabinoids than the Capitate Sessille mostly due to their larger containment capacity.

The Capitate Stalked trichomes are abundant on the floral bracts of the Cannabis plant since the Cannabis plant relies on wind pollination for reproduction, one of the primary functions of these trichomes is posited to maximize the capture of pollen blown by the wind. The size and density of Capitate Stalked trichomes must also have a strong influence on the leaf's function and ability to cope with harsh climatic conditions. Densely spaced Capitate Stalked trichome heads form a protective canopy which creates an air space the height of the trichomes stalks; this buffer zone protects the leaves from excessively severe climatic conditions. The Capitate Stalked are also believed to be very influential in filtering sunlight, reflecting infrared light and absorbing UV light.[2] The Capitate Stalked trichomes are most certainly the principal defense weapon of the plant against predators and pathogens; Capitate Stalked trichomes trap insects and produce phytochemical compounds that are toxic to invading organisms[3] or attractive to their predatory counterpart.

Note: Capitate Stalked trichomes are produced as a defensive response to un-hospitable climatic conditions which implies that optimal growing conditions for the production of flowers will not promote trichome production, an important issue for small farmers facing a ridiculously underpriced flower market and a booming concentrate market.

The endocannabinoid system in our body is as ancient as life itself, "the ability of cells to synthesize molecules that are categorized as "endocannabinoids" in mammals is an evolutionarily ancient phenomenon that may date back to the unicellular common ancestor of animals and plants" which are approximately one billion years old[4]. It took another 700 million years of evolution for the one plant in over 400,000 known species[5] to come into existence with the ability to produce the compounds specifically tailored for the endocannabinoid system receptors of mammals that would appear 300 million years later, the cannabinoids.

THE CANNABINOIDS

Cannabinoids are terpenophenolics secondary metabolites, composed of terpenoid and phenolic compound[6] biosynthesized through separate synthases within the resin head[7]. Cannabis sativa L. biosynthesizes the two most common single molecules available in the plant kingdom, terpenoid and phenolic compounds into a hundred plus cannabinoids. This unique secondary metabolic transformation

is so complex that we have not yet discovered all the elements of the process. "The cannabigerolic acid (CBGA) is the first cannabinoid formed through the condensation of a phenolic moiety, the olivetolic acid, with the terpenoid component geranyl pyrophosphate[8]. CBGA and its alkyl homolog are considered the common precursors of all the main cannabinoids produced through an enzyme activity by the plant."[9]

The Cannabigerol (CBG) and all other cannabinoids are synthesized by the plant with a carboxylic acid[10] group attached, symbolized by the letter "A" ending in all cannabinoid acronyms. The carboxylic acid groups detach naturally from the cannabinoid compounds as CO_2 gas when heat is applied. The process is known as decarboxylation, and the higher the temperature, the faster the response. Drying and curing cannabis plants in appropriate conditions will only create a minimal loss of the carboxylic acid.

The biosynthesis of CBGA into THCA, CBDA, and CBCA are triggered by different enzymes: the THCA and CBDA synthases are very similar in their biochemical properties, an 84% match while the formation of CBCA and THCA from CBGA share an inheritance relationship between the oxidase[11].

The concept that the CBDA synthase may be the original expression of the plant is being studied, and if the evolution of the enzymes creating the CBDA synthase is actually older than the evolution of the enzymes forming the THCA synthase, the Cannabis plant may have not been born psychoactive after all[12].

The Cannabis plant produces an amazing diversity of cannabinoids - over a hundred have been discovered, yet most are found at such infinitesimal small quantities that they are hardly detectable, and only a handful have been studied.

Cannabinoids are not solely created through different synthases and diverse enzymes into CBGA, CBDA, THCA, THCV, CBCA, and their decarboxylated versions, natural elements like light, heat and atmospheric conditions may also affect the biosynthesis of the cannabinoids to a degree.

THE TERPENES/TERPENOIDS (ISOPRENOIDS)[13]

The terpenes are the largest and most diversified chemical compounds produced by the plant kingdom. Terpenes are active in the primary metabolism function of plants and are the main elements of the secondary metabolites as well. Terpenes are the plant kingdom's main communication and defense mechanisms with powerful medicinal properties. Michael Wink notes in his book, Modes of Action of Herbal Medicines and Plant Secondary Metabolites; terpenes have anti-microbial, anti-oxidant, anti-fungal, anti-parasitic, anti-viral, anti-hyperglycemic, anti-hypoglycemic, anti-inflammatory and immuno-modulatory properties.

The biosynthesis of terpenes occurs through different synthases of the five-carbon compound isoprene, the building block of all terpenoids. Terpenes are classified according to the number of isoprene units forming their molecule: monoterpenes contain two isoprene units, sesquiterpenes have three, diterpenes have four, triterpenes number six, and tetraterpenes contain eight.

CANNABIS TERPENES

There are no terpenes that are unique to the Cannabis plant. Cannabis produces, nonetheless, unique terpene profiles.

Terpenoids and cannabinoids are the most influential and the dominant compounds of Cannabis' secondary metabolite expression, and, as such, Cannabis plants will express their genetic heritage while also offering a very unique interaction of cannabinoid and terpene compounds defined by the land, the climate and the life it supports.

Cannabis terpenes were not studied until recently when the U.S. Government, as part of their prohibition activities, realized that the origins of seized cannabis could be traced by studying their terpene phytochemical compositions. I should rephrase this sentence actually to give some perspective, breeders have had an interest in the terpene expressions of the plant since the mid-to-late 1960s. Their approach wasn't scientific, but the soundness of breeding programs based on terpenes is apparent in the vast diversity of terpene profiles available today.

Terpenes have the potential to facilitate the absorption of cannabinoids and of modulating cannabinoid's effects.

"Lipophilicity is a physicochemical property of crucial importance in medicinal chemistry. On the molecular level, it encodes information on the network of inter and intramolecular forces affecting drug transport through lipid structures as well as drug's interactions with the target protein. In result, on the organism level, lipophilicity is an important factor defining pharmacokinetics and pharmacodynamics of a drug substance."[14]

Monoterpenes and sesquiterpene's lipophilicity property allows a binding of the terpenes compounds to the inner core of cells which affect the cell's membrane fluidity and increase permeability and absorption[15]. This amazing terpene's property may also facilitate the passage of terpenes across the blood-brain barrier when smoking.

Cannabis terpenes modulate the psychoactive properties of THC by acting on their receptors[16], and they have the ability to "improve THC pharmacokinetics by increasing vasodilatation of alveolar capillaries which permits more absorption of THC by the lungs."[17]

There is even a terpene that transcends categorization - β-caryophyllene is the prevalent terpene in many spices and food products and also such a major element in the Cannabis terpene profile that police dogs were trained to recognize the smell. β-caryophyllene can selectively bind to the THC binding sites in the CB2 receptors of our body and, as such, can be classified as a phytocannabinoid while being molecularly different. The sesquiterpene β-caryophyllene binding to the CB2 receptor of the plant promotes cellular activation and anti-inflammatory properties.[18] [19]

Considering that terpenes are an inherent part of the structure of cannabinoids, that they facilitate the absorption of cannabinoids and modulate their interaction, it is safe to say that if a Cannabis flower or Cannabis resin does not smell and taste good, the quality will be doubtful at best.

I cannot emphasize enough the importance of learning all you can about the trichomes and the unique biosynthesis that creates 100 plus cannabinoids and over 200 terpenes. Knowledge is power and, in our case, it is also the key to maximizing quality and production.

In Part 2 we will explore the difference between an extraction and a sieving process, and the implications of using ice water as a medium to collect Cannabis trichomes.

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