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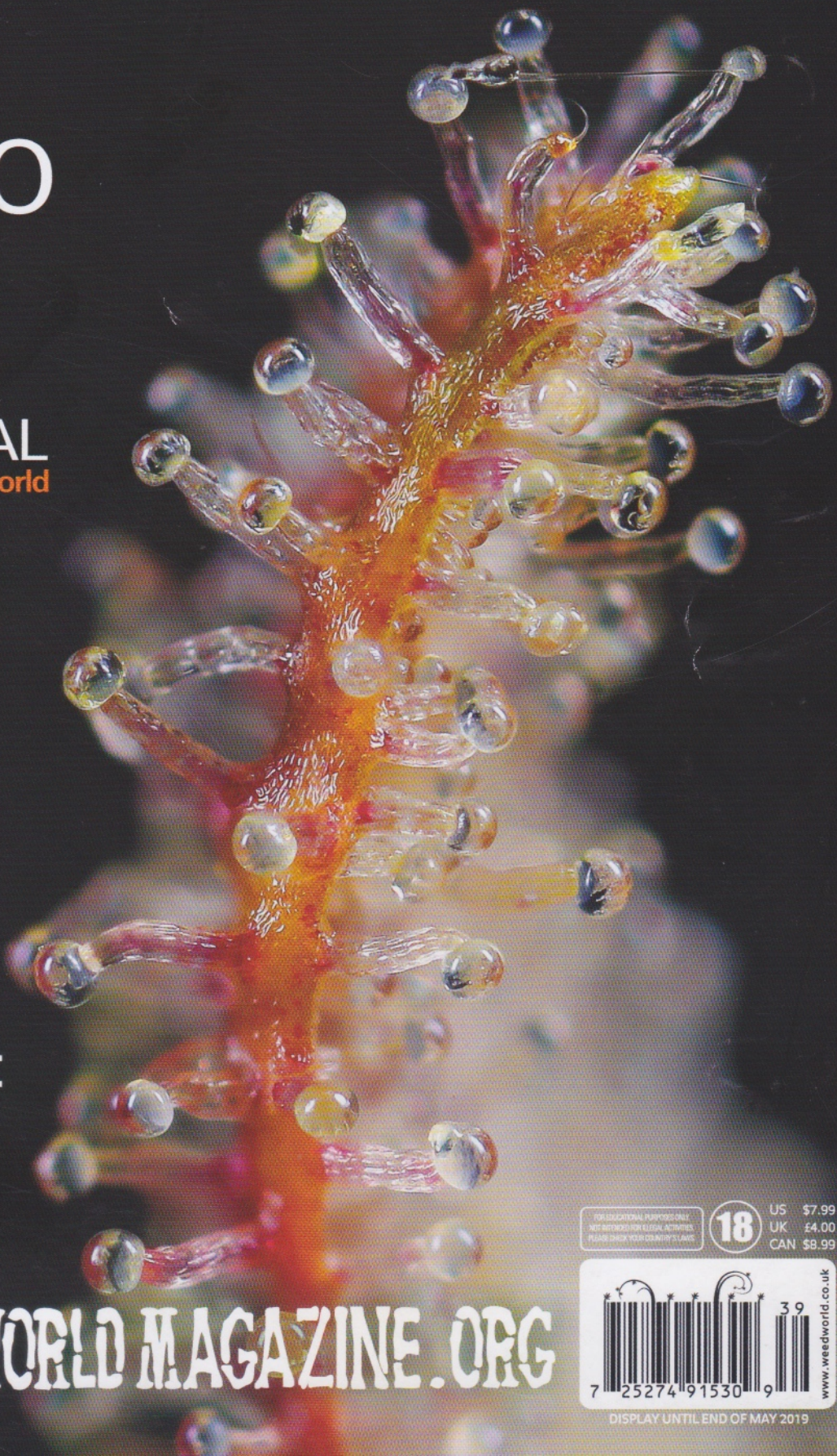

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THE LOST ART OF THE HASHISHIN

The Workshop: Part 3

Ice Water Sieving

We covered a synopsis of cannabis trichome head formation, development, and functions in Part 1 of this workshop; in Part 2 we focused on traditional dry sieving techniques, the evolutionary advantages of using water and the limitations of defining ripeness, aka the melt, by the size or coloration of the trichome heads.

Words by Frenchy Cannoli
Images by IG @trichomeartstudio

I have been seeking the highest resin quality since I started to smoke Hashish. Most of my life quality was defined by the cleanliness of the resin until I started to use water in my process half a dozen years ago. From that point on cleanliness wasn't difficult to obtain any longer. The use of water brought me to a new dimension of Cannabis resin quality. The maturity of the trichomes, which is a given in producing countries, was the new challenge working in the U.S. where most farmers harvest over a shorter growing timeframe for flower consumption, not hash making.

The frustration lasted until I stumbled on a study done by the U.S. government with the information I desperately needed.

"A resin head is made by nature like a fruit or a leaf, and as such falls at the end of its life cycle; an abscission[i] zone develops at the base of the head where the stripe cells attach to the disc cells resulting in abscission of glands upon attaining maturity"[ii]

Since a trichome head is made by nature to fall at maturity like a fruit, I could change my frame of reference and look at a cannabis plant like a fruit tree. I would have to touch and smell fruit on a tree to judge ripeness; I would most certainly not judge the ripeness of fruit by their size or coloration from a distance. I wish I could judge the ripeness of trichome heads like I would fruit on a tree, but since individual trichome head inspection is not possible with the naked eye, I adopted a straightforward approach to precisely select and collect fruit on a tree by the level of maturity.

When harvesting fruit from a tree, the ripest fruit litters the ground at the foot of the tree and are easy to collect. Whereas with cannabis, the ripest trichomes are largely lost during the harvest, the drying, the curing, and trimming of Cannabis flowers; freezing the material after a light trimming of the fan leaves or processing live plants onsite plants will minimize this loss.

The most straightforward approach to collecting fruit from a tree is to shake the tree. The force applied will define the level of maturity of the fallen fruit collected. A light shake will dislodge the ripest fruits, a second agitation a little stronger will detach fruit not as perfectly ripe, the second dimension of ripeness; a third shaking slightly more powerful will sever fruit offering a lower level of maturity and so on until no fruit remains on the tree.

I agitate Cannabis material in a vortex of ice cold water to detach trichome heads from their stalks as I would shake a tree to collect fruit, selectively by their level or dimension of ripeness. A first light agitation detaches the ripest trichomes, a second slightly stronger cycle dislodges the second level of resin maturity, a third more powerful agitation dislodges resin heads slightly less mature and so on until no resin head is left on the plant matter.

Each of these washes represents a dimension of the plant's overall ripeness ranging in size from 45-microns to 160-microns. This simplistic approach can be fine-tuned to a very selective level which has given me the ability to estimate accurately if a plant has been harvested too early or too late.

- THE TOOLS -

Sieving Bags and Set Up:
As noted in Part 2 of this series, a large work surface is beneficial to the sieving process. The bags are the sieving space, so it is imperative to have full-mesh tools to optimize the flow of water through the bags, and the sieving process through the perforations of the material.

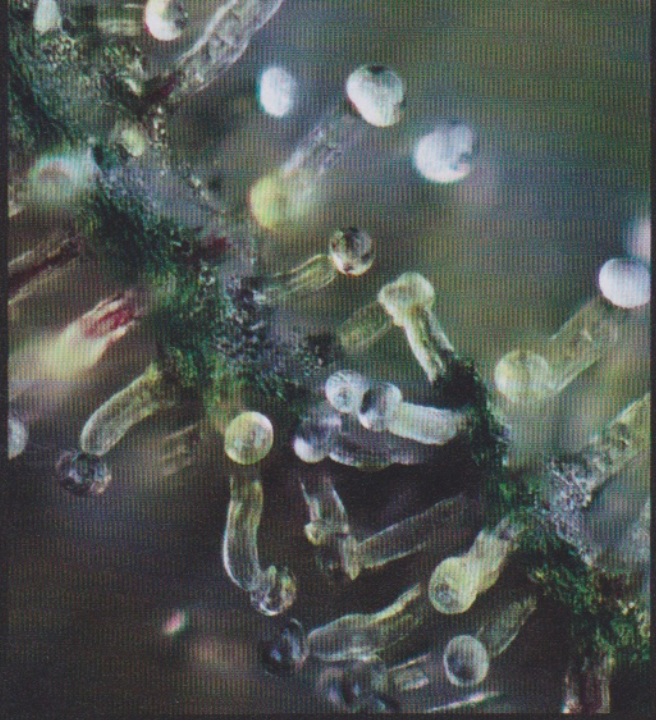
Full-mesh bags are lighter, stay cleaner and they are designed to facilitate water flow, and maximize resin and contaminant separation. The sieving bags should be made from scientifically engineered material to ensure perfect mesh size accuracy and integrity over time.

I generally use three bags stacked together: the 190-micron, which is my catch bag, the 160-micron, which harvests the larger resin heads but is harder to clean to perfection because contaminants are often the same size as the trichome heads. The third bag is my main collecting bag, the 45-micron.

I also recommend the use of a 220-micron bag when working with certain cultivars, offering

large trichome heads on inspection of the material before processing. I use the 220-micron as my catch bag to check if any larger sized resin heads have collected in the 190-micron bag. If there are none, I go back to using the 190-micron as my catch bag. If trichome heads are collecting in the 190-micron, I keep my 220-micron throughout the full process.

I use the 25-micron bag as well, but separately. All the water used in processing is filtered through it. Nothing is lost this way. The smaller and most unripe resin heads may not contain much THC or CBD, but they hold CBGA, the precursor of all cannabinoids and a valuable medicinal compound when extracted.



I use food-grade plastic buckets with the bottoms cut off for each of my bags as a support to facilitate manipulation; the bottoms are cut off at a 2" to 3" length difference to allow a gap between the bags once stretched individually on the stacked buckets. The buckets are a frame that holds the bags perfectly, and the space between each bag allows the water to flow easily and forcefully from one bag to the next which optimizes the natural separation through the meshes of the sieve brought by gravity and the weight of the water.

Agitation:
Ice cold water is the medium holding in its mass the material to be agitated, and as such the movement of the water is the critical factor. A powerful current in a contained work chamber is mandatory for the agitation process. A vortex of water has no equal; it is the most effective, forceful and gentle agitation technique available.

The Plastic Mini-Washer:
Mini-washers are available on Amazon and E-Bay for $50 to $70. Do not buy a model with a pump. You want the most basic version using gravity to empty the machine.

These machines are not designed for cannabis resin collection; this is most apparent in the structure of the exhaust hose, which is made of grooves that collect resin and contaminants. This can be easily fixed by opening the bottom of the washer and replacing the accordion hosing with a 3/4-inch diameter vinyl waterline and two elbows, one with a stopper. Cut one 2" piece of hosing and a second piece 10" to 12" long. Connect them to the elbow pieces. Use metal clamps to secure the hose to the original washer connection point.

There is also a plastic cover over the exhaust point inside the washer which needs to be removed entirely so that the flow of the water is not hampered when emptying the machine.

The vortex created by this mini-washing machine is simply the most effective and inexpensive agitation tool available. It is powerful but gentle and goes well beyond "shaking" the material forcefully, the strong water current brushes and detaches the resin heads from their stalks, optimizing the process to a new level of perfection.

The loose trim, nugs, or flowers are sucked down to the bottom of the machine and into the eye of the vortex, which spins the material in an ever-widening circle toward the surface where the material is then pushed towards the sides of the machine and sucked down to the bottom for another revolution.

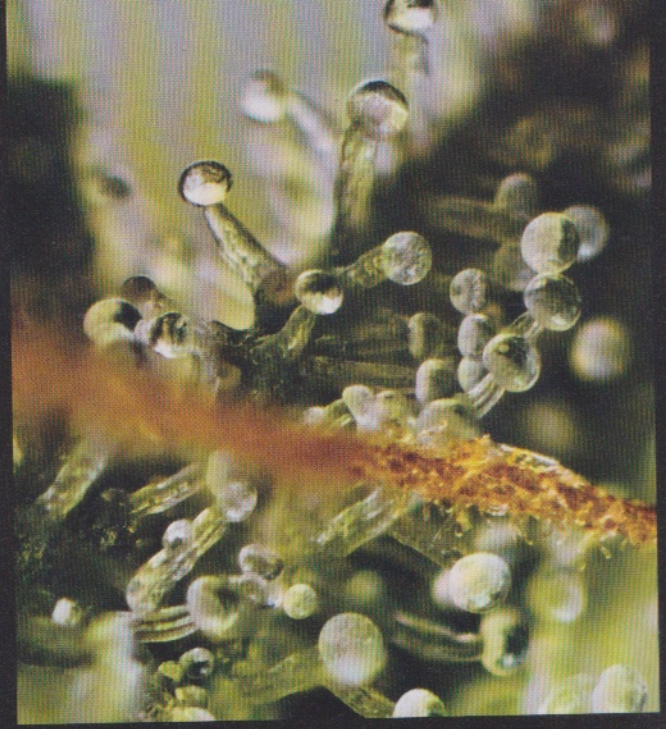
Stainless Steel Agitator:
While the conventional plastic mini-washing machine uses a vortex and works fine, it is designed to wash clothes and not engineered to agitate Cannabis plant material and collect resin in a sanitary environment; only food-grade stainless steel can offer a sterile and perfectly adapted work structure.

A streamlined tub with a smooth, curved surface to protect the integrity of the material spinning is essential to the process. Sharp-edged protuberances on the walls of the tub will shred the plant material and create contaminants. The structural adaptation of the tub by Delta Separations also added a new element to the formation of the countercurrent vortex flow. The design of the agitation chamber creates a continuous crisscrossing of the water which optimizes further the removal of the resin heads from their stalks.

The ability to maintain a stable temperature in the low 30°F is also imperative to exploit the process of water agitation fully. Resin is sticky and as such cold is mandatory to maximize separation and collection. However, ice is the nemesis; too many ice cubes will crush and shred material creating contaminants. We opted for a jacketed basin that can be used as an "insulation jacket" to reduce heat transfer and reduce the use of ice to a bare minimum; the jacketed agitation chamber stabilizes the temperature optimally so that even live resin will not stick to the washer's parts.

A conventional washing machine is limited by its wash cycle which applies a constant force, and so the strength of the agitation is defined by the length of the wash cycle and not by the force applied by the current of water because the force of the vortex is weakened depending on the amount of material and ice added to the water. The Agitator can process from a half-a-pound of material in 6 gallons of water to seven pounds in twenty-five gallons of water and anything in between due to the full user control over these important processing variables with a self-regulating "smart drive" that measures the weight load to ensure long lasting performances, and a speed (RPM) controller going up to 1700 rpm, a speed monitor and a digital system timer to set the length of the cycle.

Working with loose material in the washer exploits fully the agitation process however loose material often plugs the draining outlet of the conventional mini-washer mixing detached trichome heads and plant material which leaves many resin heads trapped in the mass. The Agitator has been designed with a large Venturi style drain engineered to give an optimal outflow pressure eliminating the potential for obstructions by plant matter completely. The water holds the



heavier resin in its mass while the lighter plant matter floats on the surface, a powerful outflow of water will keep the material and the trichome separated until the machine is emptied.

Using a Workbag:
For many concentrate processors, the standard practice is to put the dry or fresh material into a 220-micron workbag that is zipped shut and put into the washer.
This bag is the most critical factor in production because every resin head to be collected must pass through its meshes or will be lost.

First and foremost, when the workbag is put directly into the washer, the agitation and sieving process are combined, forsaking the advantage of splitting and fine-tuning the two processes separately.

Losing such an advantage is regrettable but using a 220-micron workbag also goes against all the basic principles of sieving covered in Part 2.

#1: Cleanliness - The workbag cannot be cleaned during the process which plugs perforations wash-after-wash, especially with live resin, hampering the passage of trichome.

#2: Workspace - The principle mentioned in Part 2, "The larger the work surface, the higher the probability of maximizing the methodology," doesn't apply when you have a pile of material at the bottom of a work bag twisted by a powerful vortex of water compressing the plant matter.

Material packed into a ball at the bottom of a twisted and often plugged work bag cannot be agitated and separated optimally.

Water:
Water is the perfect medium for sieving. While being classified as the universal solvent it does not act as one with Cannabis glandular trichomes; beyond rehydration and optimal agitation potential, water is also an effective containment medium for a product that is very hard and awkward to handle when dry. However, water too often contains sediments and many chemicals that are not only dangerous to consume but could potentially weaken the integrity of the trichome head membranes.

A high-end water filtering system is mandatory while a Reverse Osmosis (RO) systems is recommended but not necessary.

The purity and integrity of the collected resin is dependent, to a degree, on the quality and characteristics of the water source.

Water pH
The pH of pure water is 7 which is considered acidic. The normal range for pH in surface and groundwater systems is between 6 to 8.5.

An acidic water with pH under 6 is corrosive which damages all types of metal piping and is the reason behind the high levels of toxic metals found in acidic water.[1] On the other hand, water with a pH superior to 8.5 carries an unappealing alkaline taste and furthermore leaves deposits of calcium and magnesium after drying.

We want neither corrosive water that would weaken the integrity of the trichome head membranes or water that could compromise the quality of the terpene profile and leave a residue on the resin once evaporated. A pH ranging from 6.5 to 7.5 is recommended.

Ice:
I classify ice with water because it is part of the medium that agitates and receives the trichome, and for that reason, the ice cubes should be made with pure water only. Ice is your nemesis. It is the only variable that has the potential to crush and damage the rehydrated material. Roundish ice cubes are recommended for this reason. It is essential to understand that ice is only necessary to create a cold environment that will facilitate the separation and handling of a product that is sticky by nature. Ice is not the tool to break the resin heads from their stalks, the vortex of water does that job.

Part 4 will be dedicated to the material, live plants, fresh and frozen, cured material and the implications Cannabis diversity has on the fine-tuning of the ice water sieving methodology. I will also cover the implications of the points we covered in Part 1, 2 and 3 have on my approach to the ice water sieving methodology.

[i] Abscission: the natural separation of flowers, fruit, or leaves from plants at a special separation layer (https://www.merriam-webster.com/dictionary/abscission)

[ii] THC (TETRAHYDROCANNABINOL) ACCUMULATION IN GLANDS OF CANNABIS (CANNABACEAE) Paul G. Mahlberg and Eun Soo Kim, Department of Biology, Indiana University, Bloomington, IN USA; and Department of Biology, Konkuk University, Seoul, Korea http://www.hempreport.com/issues/17/malbody17.html

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1. www.water-research.net/index.php/ph

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