One Woman's Work in the Use of Hashish in a Medical Context

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SUMMARY. This article provides a brief introduction to the process of producing hashish with the Pollinator® and Ice-O-Lator® devices. Both are systems designed to separate the most active parts of the cannabis plant, the glandular trichomes, or "resin glands," from the plant material. The highly concentrated product of these systems has great value to medical users of cannabis, as they only need to employ a fraction of the amount of material otherwise necessary. The systems can also be used to pre-process cannabis or hemp for laboratory work that requires solely the active substances. The article also gives a brief introduction to Mila Jansen, the inventor of the Pollinator and the Ice-O-Lator.

KEYWORDS. Hashish, Pollinator, Ice-O-Lator, cannabis genetics, medical marijuana

There are several definite benefits to employing hashish as opposed to herbal cannabis, especially in a medical context. If one examines a female cannabis

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flower under a microscope (20X), the bulk is the plant material with several thin pedestals on the surface called glandular trichomes. Atop of each stalk is a tiny clear resin gland, or head, that is the component of the flower that contains approximately 90% of the active cannabinoid ingredients: tetrahydrocannabinol (THC), cannabidiol (CBD), other cannabinoids and essential oils with a variety of therapeutic terpenoid components (Clarke 1998). The concentration of these tiny resin glands into what is traditionally called hashish is a logical step when seeking a medical application of cannabis. The chemical potency will be enhanced, and levels of active ingredients will be consistent throughout all of the collected material, therefore making it easier to administer accurately in precise dosages. Extraneous fiber components unnecessary to therapeutic effects are also eliminated.

Hashish was traditionally made in many eastern countries. The primary author was lucky enough to be in Morocco in 1965 and in Turkey, Afghanistan, Northern Pakistan, India and Nepal in 1968-69. The techniques for making hashish were distinct in each of these areas. We learned to make our own, either sifting or hand rubbing the flower buds. There were government hashish shops and temples in Nepal where patrons smoked the *goolies* (balls) of hand rubbed hashish with the *babas* and *saddhus* (holy men, wandering ascetics on life long pilgrimages, smoking hashish, devoting their lives to Shiva, the Hindu God of destruction of ignorance). There, hashish is a holy sacrament. There are rituals, mantras, *mudras*, meditations and visualizations connected with the smoking of a chillum (straight clay pipe). Hashish is an age-old medicine that is also used by many cultures as a means of social and spiritual development.

Eventually, I settled in Northern India with my four children for a number of years. After coming to live in Amsterdam in 1988, I found that most cannabis users smoked marijuana and there was very little good hashish available, so we set about trying to make some of our own. We would store all the dried leaf material until the coldest nights in winter, the extreme cold being ideal for extracting the resin glands, making them easier to isolate. The leaf material would then be gently tossed over a silk screen to knock off the resin glands for collection on a smooth surface beneath. This process, taken from the ancient method employed in Afghanistan for thousands of years, was time consuming and laborious. We continued the technique until 1993, when inspired by my clothes drier, I invented the Pollinator® machine.

The Pollinator machine is a dry method of resin gland separation, which contains a removable drum that is opened for the insertion of leaf material (Figure 1). Inside the rim of the drum are several horizontal rods which further aid the tumbling of the leaf material. The drum is closed and placed back inside the Pollinator where it is turned by an electric motor. Low temperature and low humidity are crucial when using the Pollinator machine, as both these factors greatly increase the yield and the quality of the collected product. Quality of any

FIGURE 1. Mila Jansen with Pollinator® drums.

hashish or other cannabis based product is primarily genetically determined. The chemical make up, yield and other such traits are all genetically influenced. The main concern is how to extract the resin glands from the plants as cleanly and efficiently as possible. By placing the leaf material in an airtight container, which is then placed in a freezer for two hours, one may approximate the low temperature

necessary but the humidity will not be sufficiently low. We discovered that when the outside temperature was −10°C the Pollinator produced the best quality product in the shortest time period. Extreme low humidity combined with literal freezing of the resin glands produces a very clean removal of the glandular trichome heads from their brittle stalks. In an environment with a warmer working temperature, there will be a significant decrease in the quality of hashish collected as a result of a greater proportion of stalks and other small pieces of plant material being present in the subsequent collection.

The resin glands from the cannabis leaves fall through the precise fine screen around the drum onto the bottom of the Pollinator container for later collection. The size of screen employed for the Pollinator is 147 μ, so as to allow the largest resin glands to fall through freely. The quality of the hashish is dependent on the length of time the drum is allowed to turn. A session of three to five minutes produces top quality hashish (containing only glandular trichomes without plant material, dirt or other impurities); longer turning results in a lower quality as the plant material is broken down and falls through the screen, mixing with the separated resin glands. The five minute turning of the Pollinator produced hashish that would have taken hours of labor-intensive work by traditional methods. This allowed Dutch growers of cannabis to make a small amount of excellent hashish easily from plant material previously considered waste.

The Pollinator was the first modern machine to be designed for the production of hashish. The industry was previously unchanged for thousands of years due to the fact that silk screens used for sieving had not been improved until the creation of modern technology. The first Pollinator machines were sold from home, but after a couple of years, I opened a shop as there was a clear demand by many cannabis growers who had marvelled at the first public demonstration of the Pollinator machine by Robert C. Clarke at C.I.A. Amsterdam, during the 1994 High Times Cannabis Cup event. This gave us more time and space to work on the development of methods to improve the technique of pure hashish production, as previously all the testing was done at the kitchen table. It was in this shop where I made my second breakthrough, the creation of the "Ice-O-Lator®," a water and ice method of making hashish.

In 1997, we practiced at home with jugs of water, but had no satisfactory results. The big revelation did not come until we saw the Extractor®. Designed in the USA, and manufactured in Yugoslavia, this system tended to break down within 8 months, and was very heavy and expensive. All over the world, people could buy buckets and mixing machines. In the summer of 1998, I sewed my first Ice-O-Lator bags.

This method of extracting the resin glands from the leaf material involved the use of water and ice (Figure 2). Leaf material is placed in cold water (4°C), where it is agitated causing the glandular trichomes to separate from the plant material. Temperature is again of great importance. As the herbal material is agitated in the

cold water, hardened resin glands are dislodged more cleanly. Gravity then plays its part as the trichomes sink, and the plant material is left floating on the surface. With the aid of two precise screens (one for the leaf material and the other for the resin) the desirable mature glands and leaf material are separated. One factor that influences the resin glands are ideal growing conditions. Resin glands from plants grown indoors are slightly larger than those grown outdoors, as the plants have more light, nutrients and water. For outdoor growers of cannabis (or older plants where the resin glands have shrivelled with drying), I prefer a 187 µ screen on top. This will allow the resin glands to pass through while containing the rest of plant material. A pore sized screen of 62 µ as a lower screen will trap the extracted glandular heads. For growers of indoor plants with larger sized glands, I recommend a top screen of 210 µ and a 77 µ screen for the lower bag.

The Ice-O-Lator process is very simple, quick and efficient. The process begins by hanging both Ice-O-Lator bags (making sure the bag with the larger pore sized screen is on the top of the fine screened bag) in a bucket and then adding the plant material, ice blocks and enough cold water to 3/4 fill the bucket. A temperature of between 2-4°C is set before starting to agitate the plant material and ice.

FIGURE 2. Washing machine Ice-O-Lator® with open drum, ice and cannabis in filter bag.

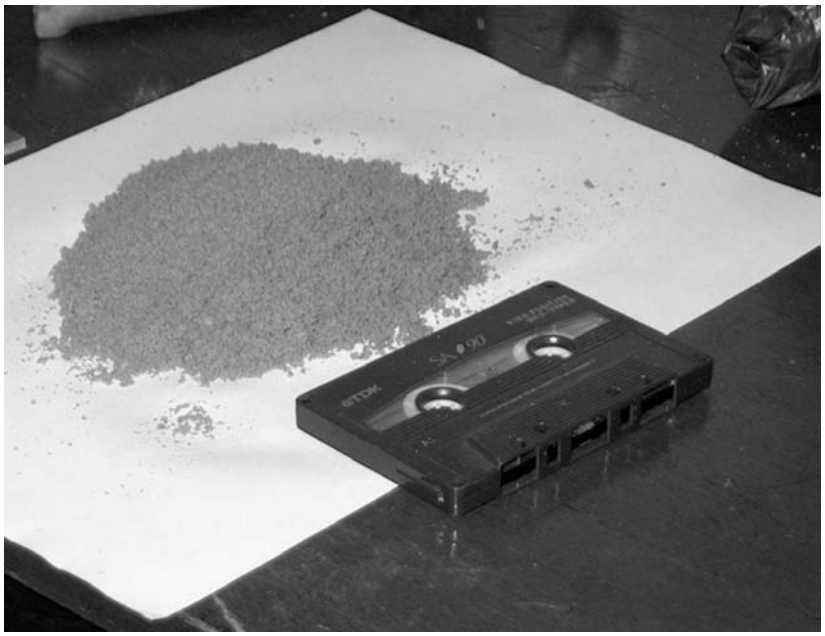
After twenty minutes of agitation, the water is left to settle for twenty minutes. In this period, the resin glands sink and any plant material rises to the surface. The top bag may then be gently raised out of the bucket, allowing the water and resin glands to drain. Lifting the lower bag out of the bucket reveals the collected trichomes once the water has drained. The inside of the bag is then rinsed with water to collect all the resin glands from the top of the screen. The outside of the bag is the wrapped in kitchen paper and pressed to remove the water. The resin glands are then sufficiently dry enough to remove from the Ice-O-Lator bag.

The collected resin glands are then placed into a metal kitchen sieve and filtered onto paper below. The resin glands are then ready for complete drying, as moisture may quickly lead to a deterioration of quality due to fungal growth. Once the resin glands are fully dried, they can be stored by pressing, or left in granular form (Figure 3). The Ice-O-Lator has proved to be the most efficient method of separation when taking into consideration factors such as time, purity and quantity. In the "coffee shops" of Amsterdam, the hashish made by this process is highly sought, as its potency and purity have become legendary. Ice-O-Lator bags have been sold throughout the world.

The Dutch Government awarded a research subsidy to the Pollinator Company in 2001 for the sole purpose of investigating resin separation methods for use in medical marijuana. As a medical commodity, cannabis has been found to aid a wide-ranging number of conditions. Demand for it in a medical context is growing due to government recognition. This subsidy has enabled us to expand our small research area and conduct tests on a daily basis. Some such experiments include sonic separation, and various wet and dry methods of sieving. Varieties of cannabis strains and growing methods are also factors to take into consideration. Cannabis strains, their yields and the potency of the resin glands also vary greatly. Lighting conditions also affect glandular trichome size. All these factors must be taken into consideration when assessing techniques of resin gland collection. Microscopy, laboratory tests, chromatography and several other methods of examination should always be employed to assess the true condition of hashish (Figure 4).

Hashish is a considerably easier substance to distribute than herbal cannabis. Storage, longevity, and consistency are all extremely important factors for medical patients who would have to administer it in precise quantities. Herbal cannabis may have little consistency in active components. Cropped buds of the cannabis plant contain varying amount of stalks, leaves and other plant material that have no beneficial therapeutic properties, and may be harmful when smoked. Moreover, as the resin glands coat the buds, heavy handling or pruning can knock off the active trichomes, diminishing potency. Once pressed, hashish is concentrated and compact, easy to store and simpler to divide into measurable doses. As many patients using "medical marijuana" require long-term treatment where

FIGURE 3. Processed "water hash" after Ice-O-Lator® treatment.

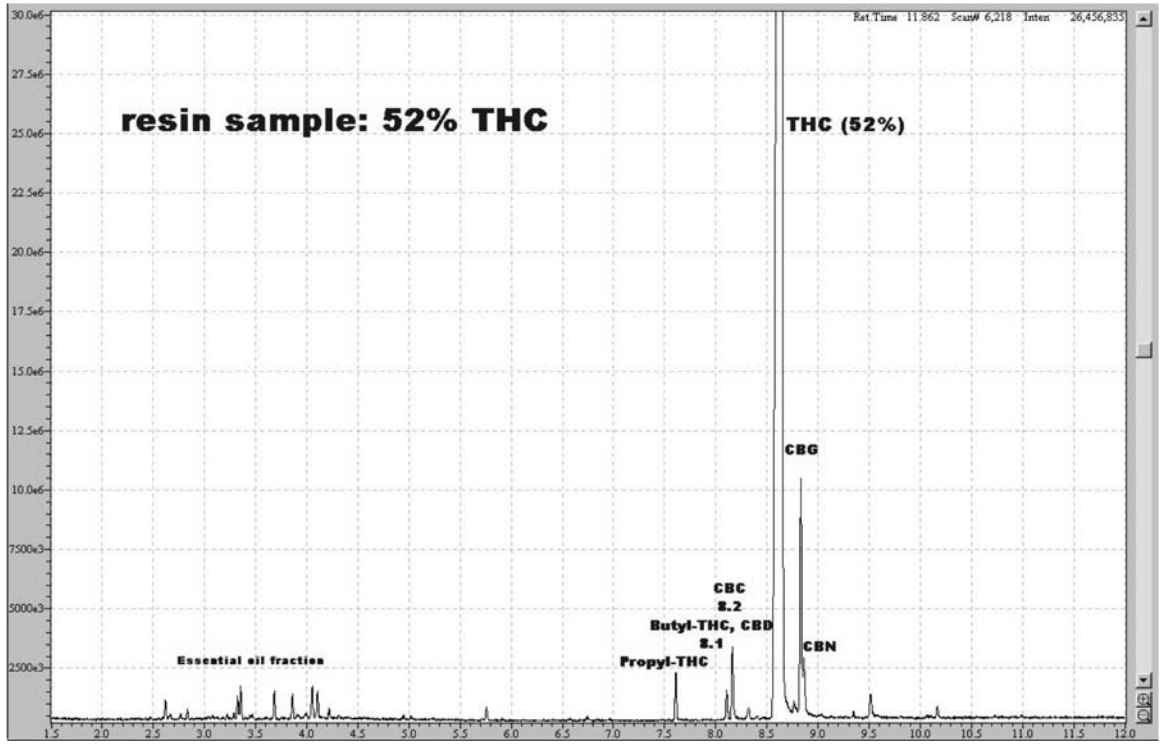


variations in dosage are important, hashish represents a considerably more practical therapeutic product.

For a number of years, both the Ice-O-Lator and Pollinator products have been used to create very pure and potent hashish from drug strains of cannabis. Recently we have begun working using hemp strains of cannabis, which have very low levels of THC and very high levels of CBD. The resulting hashish product is very useful to laboratories that are involved in the synthesis of THC from CBD (Gould 2001), a process described by Gold (1973). By using these products, pre-processing of plant material is easily achieved, ensuring that the laboratories have the best possible plant material to employ, as they may utilize only the resin glands instead of whole plants. As the laboratory work is very expensive, there are huge potential cost-saving benefits in ensuring total efficiency in all aspects of the production. This is of great interest to me, as I feel that hashish is a powerful medicine that has helped many people in cultures all over the world for hundreds of years. I am very happy to be involved in the production of medicines that can help many people.

At the Pollinator Company in spring 2002 there is much activity, as the level of interest in our products has enabled us to expand our shop space while also al-

FIGURE 4. GC/MS of a random Ice-O-Lator® hashish sample (performed by Thomas Herkenroth, THC Pharm, Frankfurt, Germany).



lowing the space to set up a dedicated research and development area. Issues concerning processing methods and medical issues will be discussed and addressed in our ongoing research of medicinal hashish production and its subsequent uses.

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