WHAT ARE TERPENES?

Every cannabis strain has a distinct smell and flavour profile. Some strains are woodsy, some spicy, some lemony. The aromas one encounters when using cannabis are due to the presence of fragrant compounds in the flowers, called terpenes. Terpenes are not unique to cannabis, in fact over 25,000 different types have been identified in nature, of which 200 are known to be produced by cannabis. [1,2]

To highlight this point, below is a list of terpenes commonly found in cannabis that are also known to be present in other plants[3]:

CARYOPHYLLENE

A terpene with a spicy scent, it is also present in black pepper.

HUMULENE

This terpene has a woody scent and can also be found in hops.

BISABOLOL

This floral-scented terpene is also found in hops and chamomile.

LIMONENE

MYRCENE

ALPHA-PINENE

Also found in lemons and other citrus fruits, this terpene has a citrusy scent.

This earthy scented terpene can also be found in bay leaves, parsley, cardamom, and basil.

A pine scented terpene that can be found in pine needles.

BORNEOL

An earthy scented terpene also found in valerian and wormwood.

BETA-PINENE

Similar to alpha-Pinene, this terpene has a pine scent and can be found in pine needles.

LINALOOL

This floral scented terpene is also found in lavender.

DID YOU KNOW: Each cannabis strain has multiple terpenes present and at various levels. The amount and ratio of terpenes found in each product is called the terpene profile and is graphically illustrated on our website for our dried flower and ingestible oil products using a terpene wheel.

Where do Terpenes Comes From?

Like cannabinoids, terpenes are found in oils located on the surface of flowers and leaves of cannabis [4]. They are produced by tiny crystal-looking structures called glandular trichomes[4]. Cannabis flowers are covered in these tiny structures giving fresh cannabis a frosty or fuzzy look before harvest.

DID YOU KNOW? As cannabis flowers begin to mature, oil droplets located on the surface of cannabis flower begin to change in color. Initially oil droplets will be clear, however as the plant ages these droplets will become cloudy or amber in colour and is a helpful indicator to growers that the plant is ready to be harvested.

What do Terpenes do?

In addition to giving cannabis its aroma, terpenes at certain concentrations have been identified as exhibiting a broad spectrum of pharmacological activity including: analgesic (pain relieving), anti-anxiety, anti-convulsant, anti-depressant, anti-inflammatory, anti-microbial, anti-pyretic (fever reducing), spasmolytic (relief of spasms), and sedative (sleep aid) [2,3]. For example, a small number of studies have shown that ingestion of lavender essential oil rich in terpenes such as linalool can yield anti-anxiety effects at certain doses (Yap et al. 2019).

A summary of purported effects for individual terpenes is provided below [2,3].

	Alpha-Bisbolol	Alpha-Pinene	Beta-Myrcene	Beta-Pinene	Beta-Caryophyllene	Borneol	D-Limonene	D-Linalool	Humulene
Memory Aid		X							
Pain Relief	X		X	X	X	X		X	
Stress Relief	X	X					X	X	
Anti-Convulsant					X			X	
Mood Altering				X			X	X	

Anti-inflammatory	X	X	X		X	X	X	X	X
Fever Reduction						X			
Anti-Stress			X				X		
Sleep Aid			X	X				X	

* This table has been provided for informational purposes only and is not intended to be used for product selection purposes.

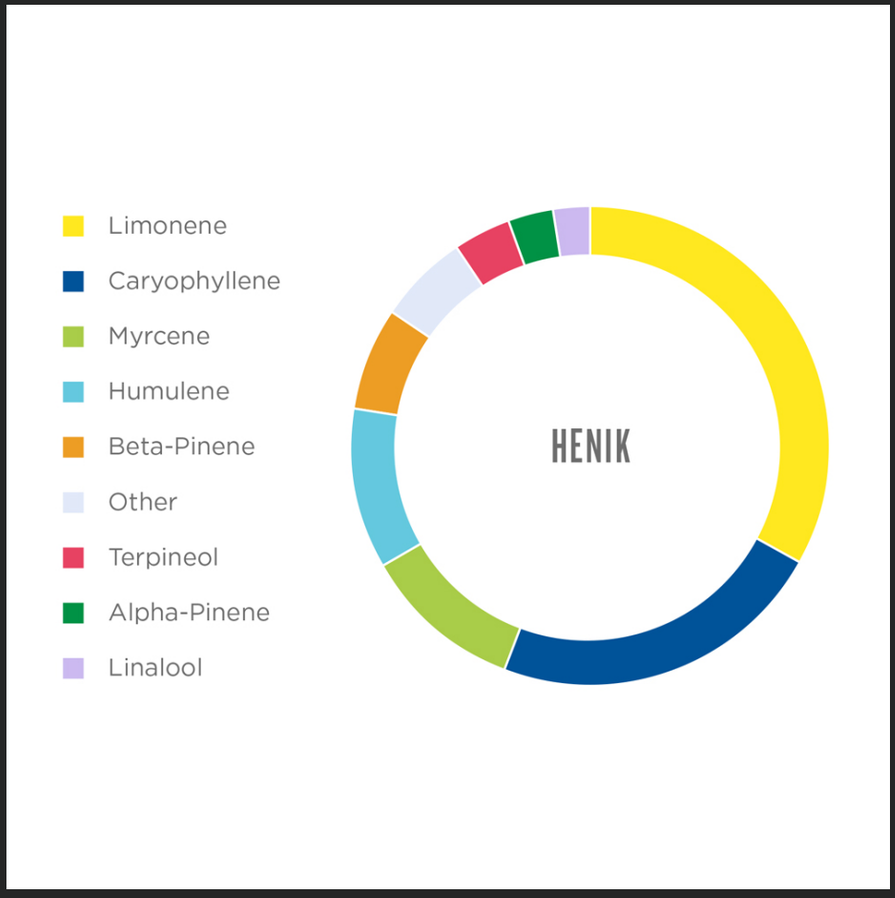
** The effects described in this table are a summary of pre-clinical findings for individual terpenes (reviewed in Russo 2011, Nuutinen 2018) which far exceed the concentrations found in cannabis products and should not be relied upon to be replicated in human studies or at the levels in which terpenes are naturally found in cannabis.

What's the Entourage Effects?

Terpenes are thought to contribute to the individual effects patients may feel between strains by "fine tuning" effects felt from THC and CBD (also known as "entourage effects")2. For example, terpene profiles of some strains are thought to promote relaxation and stress-relief, while others are believed to energize and have mood-uplifting effects5.

When to Consider the Terpene Profile of a Product?

Once you have taken into account the cannabinoid ratio and product format, the terpene profile can be considered during the product selection process by examining the terpene wheel for each product.



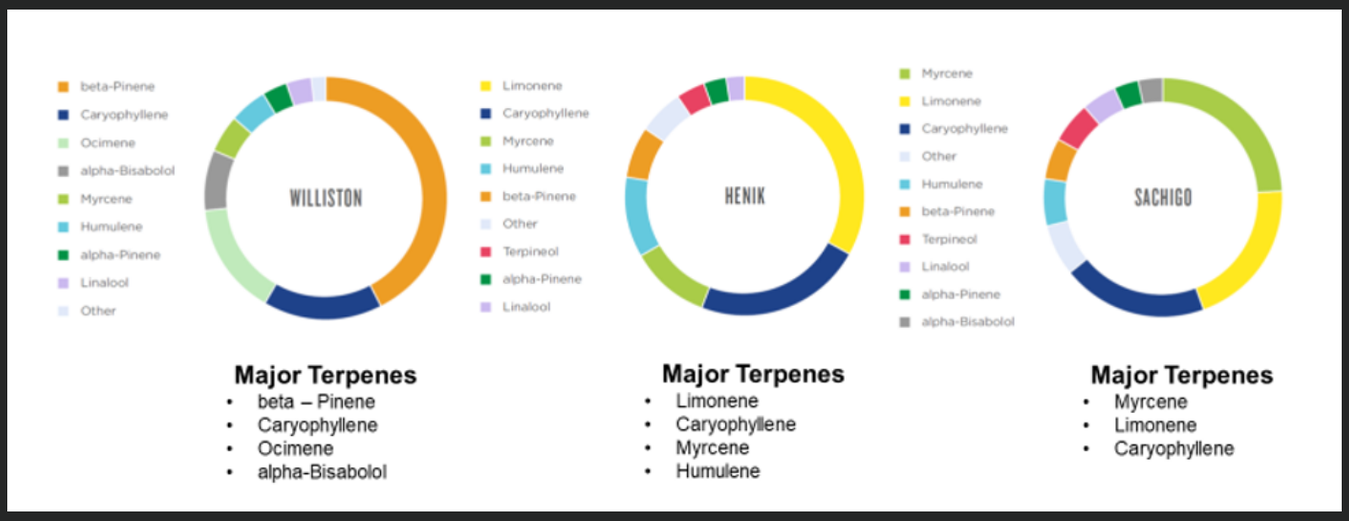
(Terpene wheel illustrating the Terpene profile for Henik (Alien Dawg) dried flower product.)

Certain cannabis strains such as Henik possess high levels of the terpene limonene (a chemical found in citrus fruits such as lemons) and it is not uncommon for patients to associate a fruity aroma with this strain.

Terpene profiles are most relevant when selecting full-spectrum products like dried flower but may be applicable to broad spectrum products such as vape concentrates.

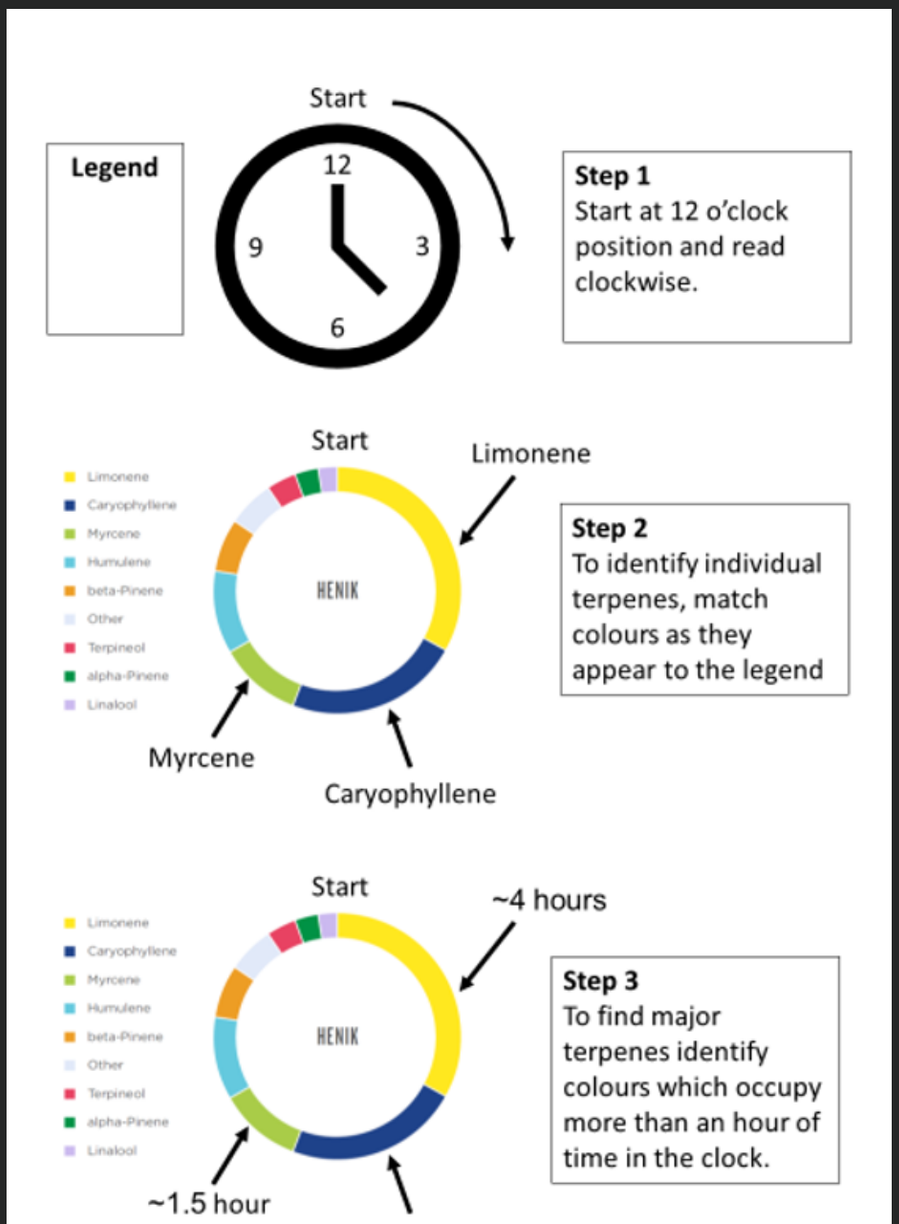
Terpene wheels enable patients to differentiate between similar cannabis product types (mainly flower) by comparing the amount and ratio of terpenes that are present in each product. For instance, we currently offer a diverse selection of THC dominant dried flower products. However, if you solely rely on the ratio of THC to CBD to differentiate between strains, it would be very hard to account for the individual effects you may feel.

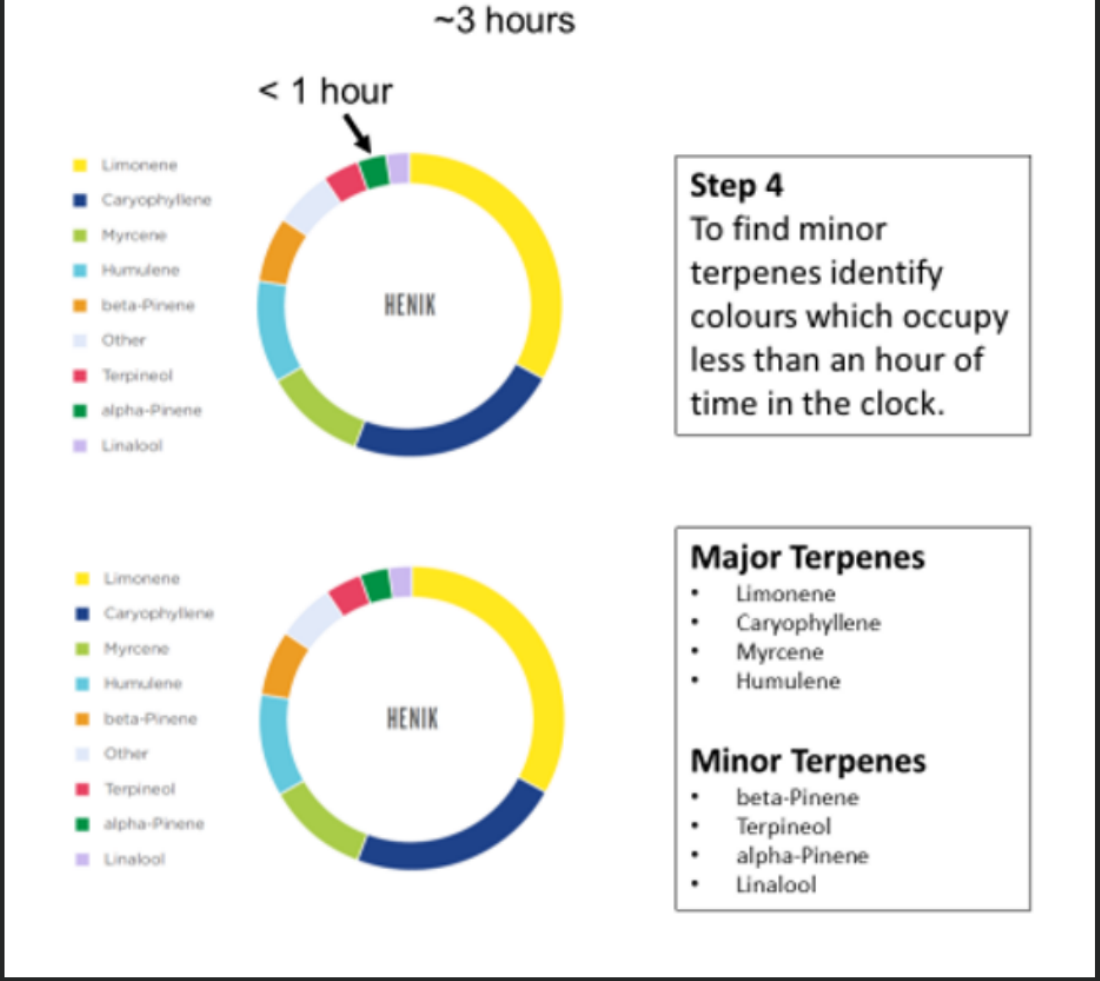
While it still unclear how individual terpenes will influence individual experiences with cannabis, patients may choose to try products with very different terpene ratios (i.e. Williston vs Henik) and to document your experiences through journaling. Once you have identified the types of terpenes you enjoy (i.e. Limonene, Caryophyllene, Myrcene), consider trying products that have a similar profile (i.e. Henik, Sachigo).



How to Read a Terpene Wheel?

Terpene wheels can be read like a clock starting at the 12 o'clock position and moving clockwise. As you move around the wheel, the information can be interpreted in the same manner as how you would read a pie chart. See further instructions below for more details.





References

1. Gershenzon and Dudareva (2007). The function of terpene natural products in the natural world. Natural Chemical Biology 3: 408-414.

2. Russo (2011). Taming THC: potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. British Journal of Pharmacology 163: 1344–1364. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3165946/

3. Nuttinen (2018). Medicinal properties of terpenes found in Cannabis sativa and Humulus lupulus. https://www.ncbi.nlm.nih.gov/pubmed/30096653

4. Solymosi K, Köfalvi A (2017) Cannabis: A treasure trove or pandora's box? Mini-Reviews in Medicinal Chemistry 17:1-70.

5. Lewis et al. (2017) Pharmacological Foundation of Cannabis Chemovars. Planta Medica. https://www.ncbi.nlm.nih.gov/pubmed/29161743