Why the Exact Origin of Cannabis' Skunk-Like Aroma is a Groundbreaking Discovery Set to Transform the Industry

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THE STUDY

For years, the cannabis science community has been befuddled by exactly what compounds are responsible for the plant's skunk-like aroma. Since the 90s, terpenes alone have been associated with the scent of cannabis and there haven't been any defined combinations of compounds found responsible for generating the unique and characteristic skunk-like aroma of cannabis.

At ABSTRAX, we're in the business of trying to find the rhyme and reason behind what makes the cannabis plant (in all of its varying aromas and forms) so very unique and powerful. We deemed it essential to create a team, led by our very own T.J. Martin, Director of Research and Development, that would use two-dimensional gas chromatography (2DGC), mass spectrometry, flame ionization detection and sulfur chemiluminescence to get to the bottom of it all.

THE DISCOVERY

The result of our study was the discovery of key volatile sulfur compounds (VSCs) – organic compounds containing sulfur – that directly correlate to the pungent aroma of cannabis. In tandem with 2DGC to analyze cannabis, the combination of multiple detectors gave us the tools needed to parse through data and identify trends between certain compounds and the aromas of various cannabis cultivars. The data gathered throughout this process conclusively established a link between this new family of VSCs in cannabis and its pungent aroma.

Gas chromatography is typically used when analyzing the volatile species of various samples – whether flowers, food or even beverages. However, cannabis presents a uniquely complex case due to the wide variety and number of aroma compounds present. Two-dimensional gas chromatography alleviates this issue by allowing for greater separation of eluents in the data. The key benefit is that the process minimizes co-elution and allows for easier identification of the chemical species. Furthermore, the use of sulfur chemiluminescence – a method of detecting only compounds with sulfur atoms within their structure – provides an easy way to identify these compounds in the data.

This is especially helpful in situations where compounds are in exceedingly low concentrations, including those discovered in this study. Much like Cannflavins are prenylated flavonoids found specifically in cannabis, some of these newly discovered 'cannasulfur compounds' also appear to be highly specific prenylated VSCs to cannabis.

WHAT THIS MEANS FOR THE CANNABIS INDUSTRY

The study results provide a starting point for further studies to be conducted that will be multidisciplinary in nature. For instance, the realization that certain cultivars may produce these compounds, while others do not, provides an opportunity to determine if this is due to genetic differences or otherwise.

For example, Bacio Gelato, which is a cultivar first bred by co-author Mario Guzman and has the highest concentration of VSCs measured in cannabis, may have genetic differences from the cultivar Black Jack, which had no measurable VSCs.In short, the study has confirmed that these compounds are the reason why some strains, like Gelato and subsequent crosses are some of the most highly sought after on the market. When we shared our data and findings with some leading cultivars, including Josh Del Rosso of OG Kush, they were fascinated by the finding that it's not terpenes alone responsible for the pungent scent of cannabis.

In fact, Del Rosso noted that perhaps the most exciting result from the study was the correlation between

the chemical structure of VSCs found in garlic and cannabis. The prenyl functional group that is found in each VSC measured is chemically similar to the allyl group found in garlic with a few modifications. These VSCs in garlic offer some of its strongest health benefits and suggest that the VSCs in cannabis may likewise possess similar activity. He hopes that the results of the study can act as a springboard to help other researchers determine if these compounds endow cannabis with even more medicinal properties that can make a marked difference in the lives of his customers.

Another result from the study was that these compounds can translate from the flower state to extracts such as butane hash oil (BHO), a popular cannabis concentrate found in vapes. We confirmed that cannabis extracts can indeed contain these compounds in reasonable concentration if processed correctly. Their high volatility makes them prone to volatilization, so we weren't sure how they would translate into cannabis extracts. We were pleasantly surprised to see high levels in the sample we measured, especially if these compounds possess beneficial medicinal properties.

Lastly, the study measured VSCs as a function of plant growth. Our team found that the concentrations of these compounds increase substantially at the end of the plant's growth and reach a maximum immediately after the curing process. Surprisingly, the concentrations of most VSCs dropped substantially after even just a week of storage.

WHAT IT PROVES

This proves that cannabis producers are racing against time when it comes to getting quality products into customers' hands. Our hopes are that results will establish a new standard for cultivators and distributors to help preserve and protect these key compounds — regardless of the rigors of processing, packaging, and time on-shelf.

Most importantly, brands will be able to maximize their products and literally push cannabis to the next level. This is vital as the industry expands and becomes more readily available around the world.

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