Book Title: Advances in Cannabis Science. Strongin et al, Editors
Chapter Title: *Aroma in Cannabis: A Foundation for Chemotype Classification*

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Abstract

Cannabis contains many biologically active ingredients. We present an approach to the categorization of these ingredients developed from our observations of a Cannabis-prevalent community. Our approach involves a linguistic analysis of aroma terms used by the community as they describe distinct Cannabis effects. Univariate and multivariate analyses are employed to determine how specific terpenes correspond to these aromatic designations. The results suggest that both terpenoid content patterns as well as patches of loss may contribute to aroma category assignments. These aroma categorizations are an opportunity to identify relationships between the multiple active Cannabis constituents and their effect. We tracked the aroma categories over time, recording responses from smoked or vaporized Cannabis flower users. The responses indicate a seasonal availability of aroma categories, which are likely due to storage and packaging capabilities, as well as market forces. There is also some indication of gender-based preferences in aroma category use patterns. Further analysis revealed that the Cannabis β-pinene : limonene ratio clearly distinguishes one of two aroma groups. The ratios persist through multiple data sets acquired from different laboratories. We propose that this ratio is an ideal biomarker, which may distinguish the commonly described uplifting vs. sedative effects of inhaled Cannabis smoke or vapor. Thus, the organoleptic description of Cannabis provides a framework for understanding universal concepts underlying the pharmacology of Cannabis.

Introduction

It is not far-fetched to hypothesize that the mutualistic coevolution of plant and human has resulted in a broad range of interactions between Cannabis and the human Endocannabinoid System (ECS). Like other botanicals, Cannabis contains many biologically active ingredients. Phytocannabinoids, a major chemical class in Cannabis, interact with the constituents of the ECS, which are located on nerve and immune cells in every human organ. The effects of this interaction are broad and involve the mediation of pain, mood, sleep, and appetite. The Clinical Endocannabinoid System Consortium (CESC) is composed of a multi-disciplinary group of scientists engaged in understanding the many-to-many interactions between Cannabis active ingredients and the ECS. Our initial goal is to categorize Cannabis active ingredients based on clinical effects.

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