

MSACL 2015 Long Abstract

Personalized Cannabinomics and the Need for Enhanced Cannabinoid Profiling

Paul Winkler¹, Ken Tanaka¹, Ken Kovash² and Scott A. Kuzdzal¹

1. Shimadzu Scientific Instruments, Columbia, MD 21046.
2. G.I. Grow Biomedical Farm, Deer Island, OR 97054.

Medicinal cannabis refers to the use of cannabis and its corresponding cannabinoids, as a therapy to treat diseases and/or alleviate symptoms. While less than 6% of today's studies on marijuana analyze its medical properties, publications to date indicate that cannabis shows great promise for the treatment of many diseases and symptoms. The cannabis industry is projected to be an \$8B industry by 2018. With this growth has come an explosion in cannabis testing labs, which perform testing that ensures patients receive safe products free from pesticides, contaminants, residual solvents and microorganisms.

This presentation will provide an overview of medicinal cannabis, including grow operations and dispensaries. This will be followed by an overview of lab testing, highlighting the analytical instrumentations used for cannabinoid profiling and potency testing. Knowledge of both the cannabinoid profile and potency is essential in informing users as well as learning more about potential health benefits.

Quantitation of the cannabinoids d9-THC-A, d9-THC, d8-THC, CBD-A, CBD, CBG, CBN and CBC were carried out using HPLC, LC-MS/MS and GC-MS on both dry products and concentrated oils. Extraction of cannabinoids using different solvents was investigated and yields for these extractions were compared, with a focus on cannabinoids with reported health benefits. Typical cannabis THC-A potencies ranged from 5 to 25 % in plant materials and edibles, but were much higher for concentrated oils. One "Melly Nova G.I." strain provided an extremely high THC-A level of 31.8 %. Multiple butane hash oil samples showed THC-A concentrations over 91 %. Fifteen terpenes, including linalool, camphene and humulene were also quantitated using GC-MS. Cannabis breeding designed to create new strains with maximum CBx levels was performed and end product potencies were determined.

While the premium products in medicinal cannabis dispensaries are typically those with high THC concentrations, other non-psychoactive "CBx" cannabinoids like cannabidiol (CBD) have been reported to reduce convulsions, inflammation, nausea and anxiety, and even eradicate tumors in some patients. A case study involving an epileptic child suffering from severe autism, including Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), Pervasive Developmental Disorder (PDD) and Sensory Processing Disorder (SPD) and leaky gut syndrome, and his experiences with CBx oils will be presented.

THC and its acidic urinary metabolites are tested in clinical, forensics and toxicology labs. Less than ten cannabinoids are routinely measured in cannabis product quality control, whereas cannabis plants contain more than 480 compounds that have been identified to be unique to cannabis (including over 70 cannabinoids). Testing must expand beyond the current handful of

commonly measured cannabinoids to larger CBx profiles in order to learn more about the health benefits of cannabis, better inform users and work towards more personalized cannabinomics strategies. This presentation will conclude with opportunities and needs for future mass spectrometry based cannabis testing.

