A140 The GC/MS of Salvinorin A in Blood Plasma as Well as an Evaluation of Standard Color Tests for the Presence of Salvinorin A

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After attending this presentation, attendees will have the foundation for developing a GC/MS method in their laboratory for the analysis of Salvinorin A and its metabolite Salvinorin B in blood plasma samples. The attendees will also learn which of the standard color tests are not capable of identifying Salvinorin A.

The presentation will impact the forensic science community by adding a new method for detecting a drug, Salvinorin A, which is now becoming regulated in many states. It will also impact the community by alerting practitioners of the color tests which are incapable of correctly identifying Salvinorin A.

In recent years, *Salvia divinorum* has become a major focus by state legislatures throughout the United States looking to prohibit the sale of the psychoactive plant. In some states (Alabama, Delaware, Louisiana, Michigan, Missouri, and Ohio) laws have been passed and many other states (Alaska, California, Florida, Iowa, Maryland, New Jersey, New York, Oregon, Pennsylvania, and Texas) are in the process of creating legislation to prohibit *S. divinorum* sales.[1] With the increasing number of states creating legislation making the sale *S. divinorum* illegal, the need for reliable presumptive and confirmatory testing methods is essential. Potential presumptive color tests were evaluated and an extraction method of Salvinorin A from plasma using selected ion monitoring gas chromatography/mass spectrometry for analysis was developed for this research.

Presumptive color tests were conducted to determine if *S. divinorum* vegetation and Salvinorin A standards would produce a positive colored result. Dried *Salvia divinorum* leaves, enhanced "extracted" leaves in 20x, 10x, and 5x potencies, liquid tincture Shepardress Essence, and standard solutions on Salvinorin A were all tested with multiple color tests that are used to preliminary determine common illicit drugs. The *S. divinorum* and Salvinorin A solutions did not react with any of the standard color tests: cobalt thiocyanate (cocaine HCl), Marquis reagent (amphetamines), Mecke reagent (MDMA), *p*-dimethylaminobenzaldehyde (LSD), and most notably the Duquenios- Levine test for marijuana. The *S. divinorum* vegetation and the Salvinorin A solutions were also tested with color tests for Vitamin A, another common diterpene, but again no reactions were produced. Additional reagents, like antimony trichloride, designed to detect the lactone were also evaluated and found to be non-effective. Further color tests are currently being conducted along with presumptive oral tests on saliva and these results will also be presented.

The psychoactive compound found in the plant, Salvinorin A, was extracted from spiked 1mL defibrinated sheep plasma samples using a cyclohexane/ethyl acetate (85/15(v:v) solution. Salvinorin A was detected from 1000 ng/mL down to 10 ng/mL using gas chromatography/mass spectrometry (GC/MS). 17-α-methyltestosterone was used as an internal standard for the study. Both the Salvinorin A and the 17-α-methyltestosterone were determined in the selected ion monitoring mode. The ions selected were 94, 273, 432 m/z for Salvinorin A and 124, 229, 302 m/z for 17-α-methyltestosterone. The underlined ions were selected for the quantification measurements. The major metabolite of Salvinorin A, Salvinorin B can also be detected in the plasma samples. The total run time was 20.67 minutes and the retention times for Salvinorin A and 17-α-methyltestosterone were 14.995 and 11.958 minutes, respectively. The optimized GC/MS assay was evaluated in terms of limit of detection (LOD), limit of quantification (LOQ), precision, accuracy, analytical recovery, and linearity. The preliminary LOD and LOQ for the assay were determined to be 10 ng/mL, and the other optimization parameters are still being evaluated.

Reference:

[1] Seibert D. The Legal Status of *Salvia divinorum.* The *Salvia divinorum* Research and Information Center. http://www.sagewisdom.org/legalstatus.html

Salvia, GC/MS, Drug Analysis

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