A180 Assessment of Methods for the Chemical Identification of the Psychoactive Plant Kanna *(Sceletium tortuosum)*

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After attending this presentation, attendees will be able to describe analytical techniques for the chemical identification of the alkaloids present in the Kanna plant *(Sceletium tortuosum)*.

This presentation will impact the forensic science community by providing information to allow the identification of the plant material using forensic testing techniques that follow SWGDRUG recommendations and standard testing protocols.

Kanna is a ground cover plant that grows in the arid climate of South Africa. Kanna contains the primary alkaloids mesembrine, mesembranol, mesembrenone, hordenine, sceletenone, sceletium A4 among many others. Some of these alkaloids have pharmacological properties reported to elevate mood and decrease stress in addition to calming anxiety and producing euphoric effects. These effects, commonly sought after by drug users, add to the overall appeal of the plant as a substance to abuse. The drugs are not controlled by the federal government so it is important to be able to distinguish these alkaloids from other vegetable material submitted for forensic examination and analysis. Kanna is featured as a natural alternative to traditional anti-depressants on many online sites that describe psychoactive experiences with the drug, and as a result of its uncontrolled status it is easy to purchase online as capsules, powders, tinctures, and seeds.

This presentation describes the evaluation of the content and characteristics of commercial Kanna preparations using common chemical color tests and thin layer chromatography (TLC), with confirmation by gas chromatography/mass spectrometry (GC/MS). The following materials were purchased from an online supplier: *Sceletium tortuosum* (Kanna) finely shredded plant material; Herb Spirits Kanna 5:1 liquid extract; Kanna whole white leaf; and Kanna 5:1 powdered extract.

A basic extraction optimized for the recovery of mesembrine along with a methanolic extraction was performed on each of the four commercially available products. Color tests including Cobalt Thiocyanate, Dille-Kopanyi, Dragondorff, Froehde, Janovsky, Liebermann, Mandelins, Marquis, Mecke, and Simons were applied to the plant material and the above extracts. A Duquenois-Levine test was performed on the Kanna whole white leaf. Color tests showed positive reactions with the optimized extraction method, but produced non-specific reactions with the methanolic extracts. The color tests that yielded the most distinguishing results included Cobalt Thiocyanate, Janovsky, Dille-Kopanyi, Dragondorff, Mecke, and Liebermann.

Extracts of all products were compared using TLC. The solvent system was a mixture of ethyl acetate, methylene chloride, methanol, and concentrated ammonium hydroxide (74:72:12:4). TLC bands were visualized using short and long ultraviolet radiation and with both acidified iodoplatinate and Dragondorff reagents. This technique produced distinctive and characteristic results from the extracts of the Kanna products. Mesembrine, mesembranol, and mesembrenone were confirmed in three of the four Kanna products analyzed; hordenine was identified in two of the products, while sceletenone and sceletium A4 were each identified in one of the products. One of the products contained no Sceletium alkaloids.

Together this battery of forensic techniques proved effective in the characterization of Kanna and used SWGDRUG compliant testing options. Analysis of commercial Kanna products showed that their content was highly variable and counterfeit products containing no alkaloids are being sold as Kanna.

Forensic Science, Kanna, *Sceletium Tortuosum*

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