F33 Geographic Variability of Active Ingredients in Spice Within Alaska as an Indicator of Mechanisms of Distribution and Manufacture

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After attending this presentation, attendees will understand: (1) the active ingredients that are commonly present within the designer drug Spice, which is found in various regions of Alaska; (2) the discrepancies between labels on Spice packaging that state it does not contain illegal substances; (3) the disparities in the active ingredients in the same brand of Spice purchased from different geographical regions; and, (4) inconsistencies in product packaging that points to how Spice is being manufactured and distributed.

This presentation will impact the forensic science community by serving as a validation of methods to identify illegal synthetic cannabinoids in Spice, provide law enforcement agencies with insight as to how Spice is being sold through legal smoke shops and head shops, and how new legislation has been combating the distribution of Spice in Alaska.

Designer drugs, like the increasingly popular Spice, are psychoactive analogs of illegal substances with understudied health effects and have traditionally been sold in packages labeled "not for human consumption." Spice consists of an arbitrary mixture of ordinary herbs (e.g., vanilla, red clover, kratom) that are sprayed with psychoactive synthetic cannabinoid compounds.[1,2] Since molecular structures can be specifically altered to circumvent legislation, recent legislative efforts have focused on regulating packaging instead of individual molecules, which has effectively reduced the distribution of Spice through legal avenues, but has not eradicated their widespread use in Alaska.[3]

Multiple active ingredients have been identified in samples from various regions in Alaska by using methanol to extract synthetic cannabinoids from the herbal matrix and reconstitute the extraction with toluene and N-methyl-N-(trimethylsilyl)-trifluoroacetamide (MSTFA) before subjecting the sample to liquid injection Gas Chromatography coupled with Mass Spectroscopy (GC/MS). The chemical 1-pentyl-3-(1-naphthoyl)indole, a scheduled substance also known as JWH-018, has been identified as one of the active ingredients present in samples from Soldotna and Wasilla. Multiple other JWH synthetic cannabinoids have been identified in the samples, all of which are scheduled substances at the state and federal levels. Some samples contain up to seven psychoactive ingredients, and the composition of the sample may vary based on purchase location for the same brand.

This presentation will provide preliminary data to support future projects that can help legislators identify which ingredients within Spice are the most hazardous and should be fast-tracked to be banned. It is hypothesized that homogeneity in the active ingredient within shops or geographic region points to a smaller number of local sources, indicating regional or in-house production. Homogeneity within a brand across regions and heterogeneity between brands points to a remote distributor.

Reference(s):

1. Sacco L.N., Finklea K. *Synthetic Drugs: Overview and Issues for Congress*. Congressional Research Service, Washington, DC; 2013
2. Ogata J., Uchiyama N., Kikura-Hanajiri R., Goda Y. DNA sequence analyses of blended herbal products including synthetic cannabinoids as designer drugs. *Forensic Science International*, Volume 227 , Issue 1 , 33 – 41.
3. Carroll F.I., Lewin A.H., Mascarella S.W., Seltzman H.H., Reddy P.A., Ann N.Y. Designer drugs: a medicinal chemistry perspective. *Acad Sci*. 2012 Feb; 1248:18-38.

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