

K27 Attribution Signatures for the Sourcing of Dokha and Dokha-Infused Tobacco Products

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Learning Overview: The goal of this presentation is to educate the viewers on dokha, a new tobacco product and how to attribute that product back to its vendor.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by addressing the feasibility of using attribution and discriminant function analysis models and their impact on drug analysis. This presentation will also provide insight into an emerging drug and its elemental content.

Dokha is a tobacco product that is primarily consumed in the Middle East.¹ It is comprised of dried tobacco leaves, spices, flowers, and other herbs.¹ The tobacco for dokha is manufactured by drying fine tobacco leaves in the desert region.² This processing method tends to lead to high levels of nicotine and carbon monoxide in dokha and associated products.² Dokha is typically smoked through a pipe called a midwakh, which is capable of holding approximately 0.5 grams in a small bowl.¹

Dokha belongs to a class of alternative tobacco products that includes items such as shisha, hookah, and vape pens.³ There is currently a rise in alternative tobacco products as there is a reported decline in cigarette usage.³ However, some of these products, like dokha, could be more harmful than cigarettes. Past research has shown that dokha tends to have significantly higher levels of nicotine when compared to certain brands of cigarettes.² There has also been research that shows dokha having potential linkages to seizure activity.⁴ This bodes as a concern as dokha has recently made its way to the United States. In fact, certain brands can be found at various local smoke shops. Dokha itself is regulated by the Food and Drug Administration (FDA) as a tobacco product and regarding package labeling; however, it is not a scheduled drug by the Drug Enforcement Agency (DEA).

The attribution of dokha and dokha-related products could be useful in cases of overdose. The hypothesis for this study is that utilizing the elemental content, a model can be made that will allow for sourcing back to the associated vendors. It is well known that certain elements, such as chromium, lead, and cobalt, are of great concern as carcinogens.¹ This study also helps to provide insight into some of those elements and their concentrations in these products. A total of four vendors were evaluated for this analysis and one vendor was also evaluated for the dokha-infused hookah product that they sell. This additional dokha-infused hookah was chosen for evaluation because hookah is a particularly popular recreational drug of consumption in the United States. To retain continuity between the brands, only the unflavored type of each brand was purchased from the vendors' respective websites. Each dokha sample was digested in triplicate in an overnight digestion procedure consisting of 7N nitric acid. The Inductively Coupled Plasma/Mass Spectrometer (ICP/MS) was the instrument used to obtain the inorganic elemental data. A discriminant function analysis plot was used to establish a model for separation between each separate brand of dokha based on their respective elemental contents.

Reference(s):

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Attribution, Dokha, ICP/MS