A26 Analysis of a New Synthetic Street Drug "Molly Plant Food" by Mass Spectrometry and Vibrational Spectroscopy

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After attending this presentation, attendees will learn about the composition of the new synthetic drug "Molly Plant Food" as well as the methods used for analyzing the synthetic drug. Interpretation of data acquired via pyrolysis-gas chromatography-mass spectrometry, liquid chromatography-mass spectrometry, and Raman spectroscopy will be presented. The analysis of this new synthetic drug will contribute to better understanding of this and other similar variations of this synthetic drug with different substituent groups among the cathinones. The methodologies and findings will contribute to future protocols for analyzing and assessing the toxicological effects of the banned synthetic stimulants substances.

This presentation will impact the forensic science community by providing an analysis of the the synthetic stimulant drug toxicology, the various kind of methcathinone commonly detected in these stimulant drugs, and the findings of methcathinone in the Molly Plant Food. This rapid, reliable method of analysis of synthetic stimulant substances will enable law enforcement authorities to easily identify the new drug and better understand the toxicological effects.

In recent years, the production of fake "Ecstasy" has grown quite popular. Many abuse this new synthetic drug as a substitute for the real Ecstasy, which is illegal to possess and expensive to purchase in the black market. Fake Ecstasy is commonly known as Molly Plant Food or Rave Bath Salts is sold in convenience stores as common household products like bath salts or plant food.[1] Molly Plant Food is said to provide the same euphoric feeling as Ecstasy. This synthetic drug is said to contain either methylone (3, 4-methylenedioxy-N-methylcathinone), MDPV, mephedrone (4-methylmethcathinone), or many other methcathinones derivatives.[2] Many users of this fake Ecstasy do not know that it closely resembles methamphetamine, lacking only two functional groups. The primary buyers of these drugs are teens that may not be aware of the dangers of this drug. In recent years, there have been many cases of hospitalization and even death resulting from the use these drugs. As previously mentioned, the effect of this drug resembles that of Ecstasy; however, other compounds are added to mask its intended use as a drug of abuse and to allow it to be advertised as a plant growth agent or muscle relaxant. Since not much is known of this drug, it has the capacity to be abused at high levels, which can lead to death.

The research used high performance liquid chromatography to retrieve the different kinds of chemical components present in the Molly Plant Food.[3] The results of the LC/MS showed the presence of mephedrone and MDPV in the Molly Plant Food. Mephedrone and MDPV are just two of the many methcathinones found in various illegal synthetic stimulant drugs. The use of Raman spectroscopy provided a spectrum of the chemical constituent. The Raman findings showed strong bands at 2950cm^{-1}, 1750 cm^{-1}, 1020 cm^{-1}, and 770cm^{-1}. These findings provide a general distinctive identifying characteristic for the illegal compound. The finding of exact transition ion intensities at 10V, 27V, 36V, and the existence of methcathinone were confirmed via LC/MS. Further, the pyrolysis-GC/MS conducted on Molly Plant Food showed a high concentration of analgesic chemicals of the naphthoylindole family. The use of high temperature nickel-cobalt foil at 590°C and 670°C showed the presence of JWH-018 and JWH-073 when Molly Plant Food was pyrolyzed. These compounds were recently used in many synthetic cannabis products to give the same "high" effects of those of THC.[4] Since the drug usually comes in capsule or powder form, the understanding of the chemical constituents of these drugs makes makes them easier to identify.

References:

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Toxicology, Stimulant Drug, Methcathinone

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