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Development of a screening kit for detecting synthetic cathinones

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In recent years, abuse of illicit drug has been a very important problem. Significant amount of unknown illicit substances are sized by law enforcement and boarder protection agencies. Synthetic cannabinoids and cathinones have a psychoactive effect on our bodies. The identification of these drugs is important not only for the proof of the crime, but also human health. Generally, to identify the illicit drugs, we use the techniques such as gas chromatography-mass spectrometry (GC-MS) and high performance liquid chromatography-mass spectrometry (HPLC-MS). These instruments, however, are not always convenient owing to their high cost of running, the need for trained personnel, lengthy analysis times, etc. Screening kits for detecting drugs, therefore, are required at the scene of crime and the development of them is desired. In this study, we have designed the screening kit for cathinones to provide easily an indication of the presence or absence of cathinones in a test sample. This kit consists of a glass tube enclosed reagents which react with them (named "cathinone detector tube"). This kit utilizes the reaction of cathinons with neocuproine and copper(II) to give a colored copper(I)-neocuproine complex. The presumptive color test method for the detection of synthetic cathinones by Morgan Philip, et al. is applied to the development of this screening kit. They describe that neocuproine color test displays good selectivity to cathinone analogs. To improve operativity and preservation of our kit, three aqueous solutions were coated on silica gel particle and then the powders have been enclosed in a single glass tube. The reagent in the tube colored orange from light blue in the presence of cathinones. In consequence, this kit had very high sensitivity for detecting cathinones. The limit of detection of α -PVP, for example, was 5 μ g (absolute amount, 100 μ L of 50 μ g/mL solution).



Figure-1: Cathinone detector tube. Approximately 100 μ L of a test solution is sucked into the detector tube. Upper one is positive control. Orange color appeared in the presence of cathinones.

References

1. Morgan Philip, Ronald Shimmon, Mark Tahtouh, Shanlin Fu (2016) Development and validation of a presumptive color test method for the detection synthetic cathinones in seized illicit materials. *Forensic Chem*; 1: 39-50.

Biography

Yuki Mukai is currently a Masters student at University of Tsukuba, Japan. She belongs to Department of Legal Medicine and interested in drug abuse that is social problem in the world, especially in synthetic cannabinoids and cathinones. She has recently developed a screening kit for detecting synthetic cathinones.

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