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Heroin and Opiates Metabolites Tracing by Gas-Chromatography Isotope Ratio Mass Spectrometry

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Abstract : 'Poppy-seed defense' has been a serious problem all over the world, that is because the opiates metabolites in urine are difficult to distinguish where they come from precisely. In this research, a powerful analytic method has been developed to trace the opiates metabolites in urine by Gas-Chromatography Isotope Ratio Mass Spectrometry (GC-IRMS). In order to eliminate the interference of synthesis to heroin or metabolism through human body, opiates metabolites in urine and sized heroin were hydrolyzed to morphine. Morphine is the key compound for tracing between opiates metabolites and seized heroin in this research. By matching δ13C and δ15N values through morphine, it is successful to distinguish the opiates metabolites coming from heroin or medicine. We tested seven heroin abuser's metabolites and seized heroin in crime sites, the result showed that opiates metabolites coming from seized heroin, the variation of δ13C and δ15N for morphine are within 0.2 and 2.5‰, respectively. The variation of δ13C and δ15N for morphine are reasonable with the result of matrix match experiments. Above all, the uncertainty of 'Poppy-seed defense' can be solved easily by this analytic method, it provides the direct evidence for judge to make accurate conviction without hesitation.

Keywords : poppy-seed defense, heroin, opiates metabolites, isotope ratio mass spectrometry
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