CASE REPORT

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Ethylbenzoylecgonine: A Novel Component in Illicit Cocaine

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ABSTRACT: Ethylbenzoylecgonine, a cocaine homolog, was identified in illicit cocaine samples that had been imported dissolved in liquor. A gas chromatogram and mass spectrum of ethylbenzoylecgonine are presented.

KEYWORDS: toxicology, ethylbenzoylecgonine, cocaine

Case History

A number of cocaine exhibits were seized as the result of an undercover drug enforcement operation. The cocaine had been brought into Canada dissolved in bottles of liquor and was subsequently extracted from the liquor and converted to its hydrochloride salt. Laboratory analysis of the cocaine samples revealed the presence of ethylbenzoylecgonine, a cocaine homolog not normally seen in illicit cocaine.

Ethylbenzoylecgonine, also known as cocaethylene or homocaine, is the ethyl homolog of cocaine and is known to have local anesthetic properties [*1*].

Materials and Methods

Samples of the cocaine exhibits were dissolved in methanol and screened using a Hewlett-Packard 5730A gas chromatograph equipped with a 12.5-m DB-1 methyl silicone capillary column (50:1 split) and a flame-ionization detector. Helium was used as the carrier gas at a flow rate of 1.2 mL/min. The helium makeup gas, air, and hydrogen were set at 40, 230, and 40 mL/min, respectively. The gas chromatograph was programed for an initial temperature of 120°C, followed by an 8°C/min increase to the final temperature of 320°C, which was held for an additional 8 min. The injection port and detector

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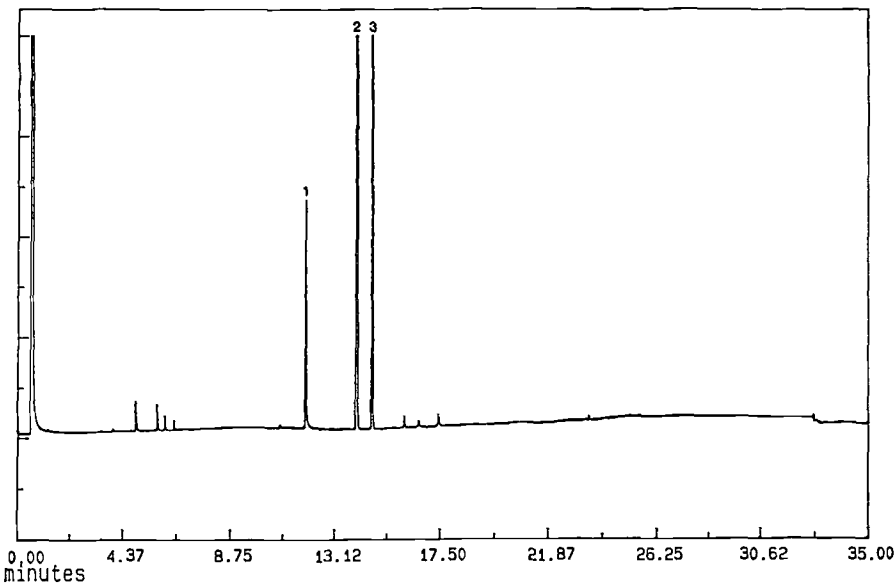

FIG. 1—*Gas chromatograph of the cocaine sample. Peak identification: 1 = aminochlorobenzophenone (external standard); 2 = cocaine; 3 = ethylbenzoylecgonine.*

temperatures were set at 250 and 350°C, respectively. Gas chromatography data were acquired using an HP-1000 laboratory-distributed system. As an external standard, 2-amino-5-chlorobenzophenone was coinjected. The peak identities were confirmed using a Finnigan Incos-50 mass spectrometer coupled to a Hewlett-Packard 5890 gas chromatograph with a DB-1 capillary column, operated in the electron impact mode at 70 eV.

Results

A representative gas chromatograph (GC) and mass spectra for ethylbenzoylecgonine and cocaine are shown in Figs. 1, 2, and 3, respectively. The GC retention time for ethylbenzoylecgonine relative to cocaine is 1.05.

Discussion

The mass spectrum for ethylbenzoylecgonine was confirmed by comparison with a mass spectrum published by Valentour et al. [*2*]. These authors generated ethylbenzoylecgonine by extractive ethylation of benzoylecgonine using ethyl iodide, as a means for simultaneous gas chromatographic determination of cocaine and its primary metabolite from biological samples. Ethylbenzoylecgonine has been reported as a biotransformation product in urine samples containing ethyl alcohol [*3*]. In this case, the prolonged exposure of the cocaine to ethanol while it was dissolved in liquor seems to have resulted in the transesterification of approximately 20% of the cocaine to its ethylated homolog. The ethylbenzoylecgonine was coextracted and converted to its hydrochloride salt, along with cocaine, thus appearing as a component in the final illicit product.

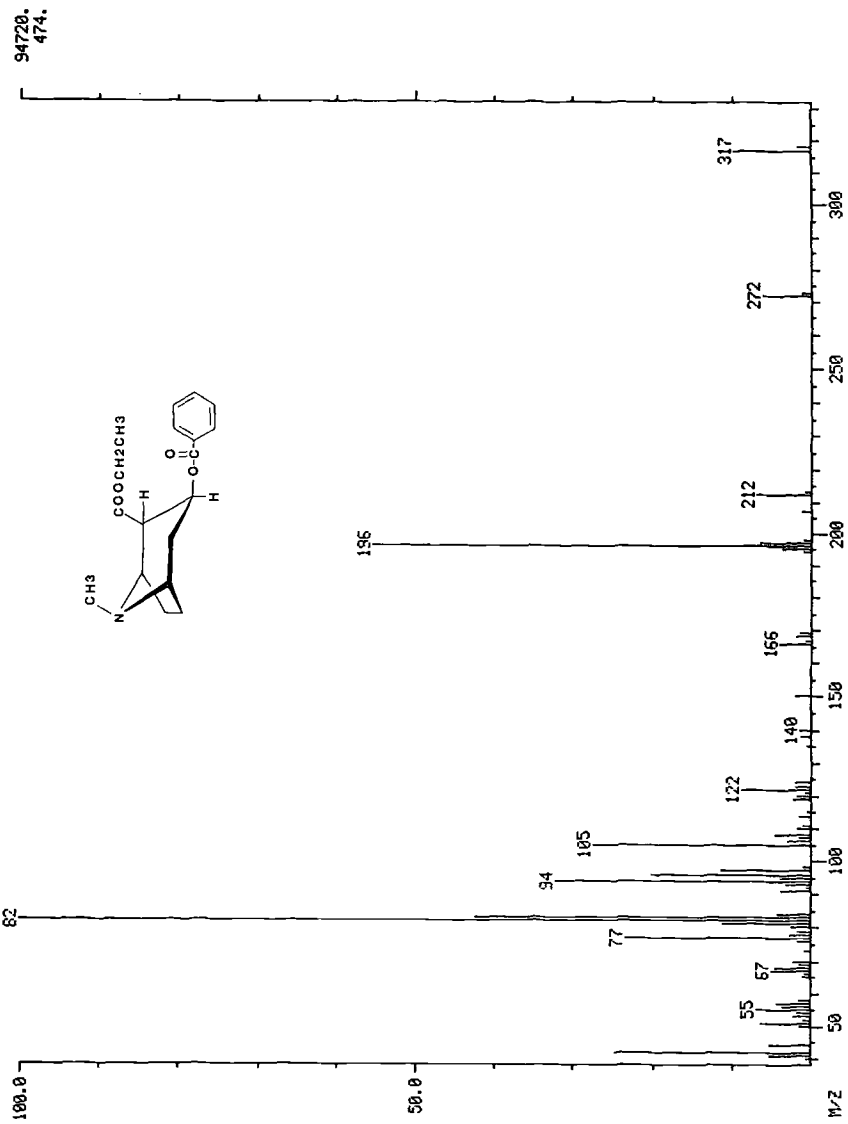

FIG. 2—*Electron impact mass spectrum of ethylbenzoylecgonine.*

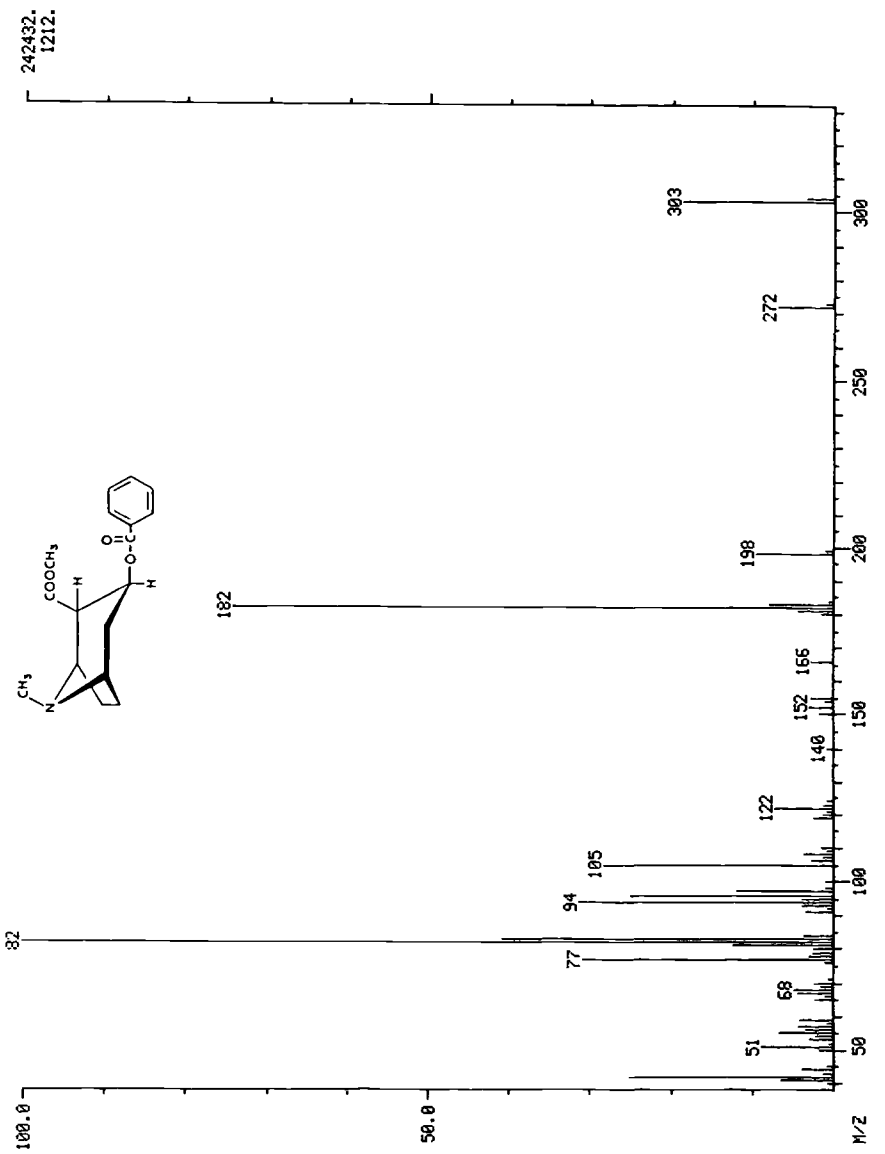

FIG. 3—*Electron impact mass spectrum of cocaine.*

References

[1] Budavari, S., Ed., *The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals*, Merck and Co., Rahway, NJ, 1989.
[2] Valentour, J. C., Aggarwal, V., McGee, M. P., and Goza, S. W., "Cocaine and Benzoylecgonine Determinations in Postmortem Samples by Gas Chromatography," *Journal of Analytical Toxicology*, Vol. 2, July/August 1978, pp. 134–137.
[3] Rafla, F. K. and Epstein, R. L., "Identification of Cocaine and Its Metabolites in Human Urine in the Presence of Ethyl Alcohol," *Journal of Analytical Toxicology*, Vol. 3, March/April 1979, pp. 59–63.

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