Waters
Lab Highlights
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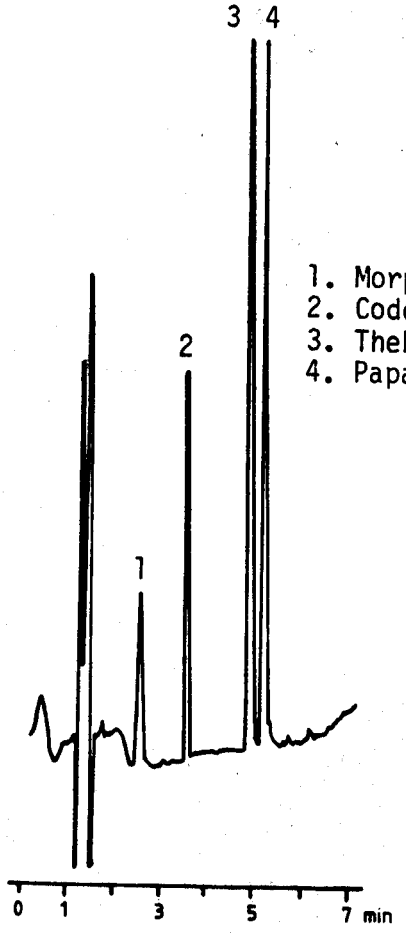
RAPID ANALYSIS OF OPIUM ALKALOIDS USING RADIAL-PAK™ NOVA-PAK™ C_{18} COLUMNS

A number of HPLC methods for the simultaneous analysis of the four major opium alkaloids: morphine, codeine, thebaine, and papaverine have been developed. Use of Radial Compression Technology with the new NOVA-PAK™ chemistry allowed these authors to develop a rapid analysis for these compounds with improved sensitivity (1). The authors concluded that "...the new NOVA C_{18} packing allows for a greater resolution of alkaloids present in low concentration and provides more complete separation of the constitutions (SIC) of freshly exuded latex from the opium poppy."

Analysis conditions were as follows:

Column: NOVA-PAK™ C_{18}, 8 mm I.D. X 10 cm Radial-PAK™ cartridge
Eluents: A: 10 mM $KClO_4$/5 mM n-Butylamine, pH 3.0 (adjusted with $HClO_4$);
B: Acetonitrile
Flow Rate: 3 ml/min.
Detector: 280 nm



1. Morphine
2. Codeine
3. Thebaine
4. Papaverine

FIGURE 1

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GRADIENT:

TIME	FLOW	%A	%B	CURVE
Initial	3.0	90	10	*
5.0	3.0	30	70	6
7.0	3.0	30	70	6

FIGURE 2

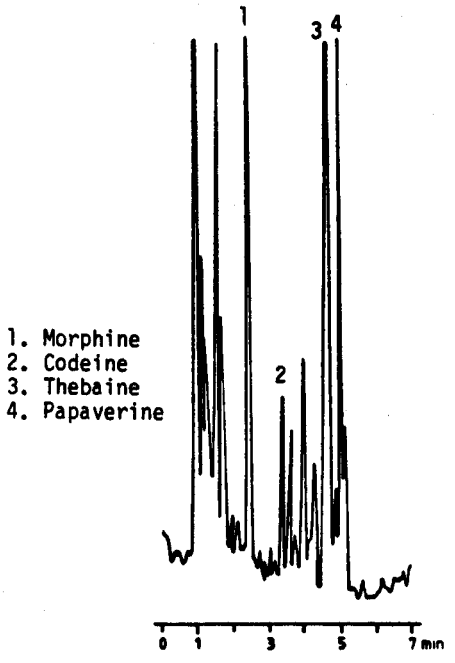

TABLE 1: REPRODUCIBILITY OF THE DETERMINATION OF ALKALOID STANDARDS

	Morphine	Codeine	Thebaine	Papaverine
Known Concentration (µg/ml)	10.00	10.00	10.00	10.00
Observed Concentration (µg/ml)	10.00	10.00	10.00	10.00
Standard deviation	0.53	0.18	0.04	0.06
Relative standard deviaton (%)	5.3	1.8	0.4	0.6

The LC system consisted of one M6000A and one M45 pump, WISP™ autosampler, M720 System Controller, M440 Detector (@ 280 nm), an M730 Data Module, and a Z-Module™ Radial Compression Separation System.

Chromatograms of the alkaloid standards and freshly exuded opium poppy latex are shown in Figures 1 and 2, respectively. Table 1 shows reproducibility of the determinations of standards (n = 12).

1. Galewski, S. and Nessler, C. L., Chromatographia, 18, No.2 (1984) p87-90.