

### USE OF SODIUM COBALTINITRITE AS A NEW SPRAY REAGENT FOR THE DETECTION OF SOME OPIUM ALKALOIDS ON TLC PLATES

THE detection of various opium alkaloids on TLC plates has been accomplished by a large number of spraying reagents and visualization techniques developed by various workers, which has been reviewed by Santavy<sup>1</sup>.

Fiegel<sup>2</sup> has reported that in addition to phenolic compounds which have a free position ortho to a phenolic -OH group, morphine and many other compounds give a positive spot test with an aqueous solution of sodium cobaltinitrite. Bhatia *et al.*<sup>3</sup>, have suggested a general spraying reagent for phenolic compounds on TLC plates which is a slight modification of the Fiegel's test. It was therefore thought worthwhile to investigate the efficacy of Bhatia *et al.*'s modified sodium cobaltinitrite reagent for the detection of five common opium alkaloids, viz., morphine, codeine, papaverine, narcotine and thebaine, which is presented in this communication.

Thin layer plates of glass (20 × 20 cm) were prepared as described by Rama Rao and Murty<sup>4</sup> in which they have coated plates with silica gel—G—containing 4% sodium carbonate. The plates were activated at 110° C for one hour. The solvent system consisting of chloroform—ethanol (8 : 2) was used. The modified sodium cobaltinitrite reagent is prepared as described by Bhatia *et al.*<sup>3</sup>, which is reproduced here. 4.4 g. NaNO<sub>2</sub> is dissolved in 10 ml water. To this solution a solution of CO (NO<sub>3</sub>)<sub>2</sub> prepared by dissolving 2.6 g. CO (NO<sub>3</sub>)<sub>2</sub> in 2 ml anhydrous acetic acid is added. To this combined solution 20 ml anhydrous acetic acid and 50 ml water is added. The plates were spotted with solutions of above alkaloids (1 mg/ml) prepared in chloroform (except morphine which was prepared in methanol). After development the plates were air dried and then sprayed with modified cobaltinitrite spray reagent. Subsequently after air drying the plates were heated in an oven at 105° C for 10 min. The colours observed under ordinary light and fluorescence observed under UV light along with the sensitivities are presented in Table I. The colours were stable for several hours. The initial blue background fades out gradually leaving the spots visible against a white background.

The reagent was tried on an extract of opium and was found to give good visualization. The reagent appears to be sensitive for visualizing the alkaloids of opium in crude extracts as well as in other samples of forensic interest.

TABLE I

Visualization of some common opium alkaloids on TLC plates with modified sodium cobaltinitrite spray reagent

Alkaloid	Colour observed in daylight	Fluorescence under UV light	Minimum detectable limit (µg)
1. Morphine	Yellowish brown	Green	5
2. Codeine	do.	..	20
3. Thebaine	do.	..	5
4. Papaverine	do.	..	5
5. Narcotine	do.	Bluish green	5

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2. Fiegel, F., *Spot Tests in Organic Analysis*, Elsevier, New York, 1966, p. 183.
3. Bhatia, I. S., Bajaj, K. L., Verma, A. K. and Singh Joginder, *J. Chromatogr.*, 1971, 62, 471.
4. Rama Rao, N. V. and Murty, H. R. K., *J. Ind. Acad. Forens. Sci.*, 1974, 13, 18.

### ORIENTATION OF THE SPERMATOZOA IN THE SEMINIFEROUS TUBULES OF SOME BATS

THE mechanism by which spermatozoa are transported from their place of origin in the seminiferous tubules to the epididymis is not clearly understood and has led to considerable speculation by workers. Most of the workers however agree that the spermatozoa are passive in this process, being either carried by a fluid current through the seminiferous tubules or passed towards the distal regions of the tubules by undulating movements of the walls of the seminiferous tubules. A critical review of the earlier work on this subject is given by Bishop<sup>1</sup>.

During the course of a study of the male reproductive structure of several species of Indian bats the authors noted that bundles of sperm tails are oriented in a spiral manner in transverse sections of the seminiferous tubules during the