Breath analysis of cannabis smokers

Cannabis (dagga) grows so widely in South Africa that its control poses considerable problems. A simple screening test to detect cannabis smokers was sought but enquiry by one of us (van Zyl, 1970) revealed that no such test existed. To this end we have investigated the possibility of a "breathalyser", and preliminary investigations have been encouraging. The suspect is required to breathe onto a paper (filter paper or tissue) freshly dampened with aqueous Fast Blue B salt 1% w/v. Korte & Sieper (1964) state that this reagent has a sensitivity down to 0·01 μg by t.l.c.). The colour response is from bright orange-pink to deep orange-pink tinged with mauve up to 15 min after smoking and a colour is obtainable up to 2 h after one typical cannabis cigarette. Colour formation is sometimes not instantaneous. South African cannabis is potent (de Faubert Maunder, 1970, Fairbairn, Liebmann & Simic, 1971) so that the response might well be weaker elsewhere. We have investigated substances that might interfere, but items like spices and peppermints, give only the faintest response. A positive result can immediately be followed by testing any found material using Fast Blue B (de Faubert Maunder, 1969 a) and confirmed in the laboratory. Two simple colour tests, the first using Fast Blue B and the second "Meta" Duquenois reagent have been described for almost specific identification (de Faubert Maunder, 1969 b).

Both Betts & Holloway (1967) and de Faubert Maunder (1969 a) when investigating cannabis, found no interference from tobacco. In South Africa, however, there are brands of toasted cigarettes which with Fast Blue B gives a marked and similar reaction to cannabis from the smoke itself, but not from light petroleum extracts of the tobacco. Some cigars give a deep yellow orange, although only from fresh smoke. Smoked tobacco also gives a false positive, but if the remaining tobacco in benzene is chromatographed as described below, false positives fade if left overnight whereas the cannabis colour does not.

An attempt to elute the smoke dye complex with ether followed by t.l.c. on silica gel (Merck Kieselgel F254) using benzene–ethanol (5 : 1) showed that the cannabis-dye complex and tobacco smoke-dye ran to similar R_F values. However, if cannabis smoke and the smoke of two toasted cigarettes were separately drawn through filter discs (Cambridge CM-113, 1·5 mm thick) and the tar thus collected was eluted with ether and chromatographed on silica gel using benzene, on spraying with Fast Blue B, the discs showed that only the cannabis had run (R_F 0·63), giving a spot suggesting cannabinol and tetrahydrocannabinol (de Faubert Maunder, 1969 c). Nutmeg, gives a similar colour with the reagent, and spreads to an R_F of about 0·2, while thymol, which gives a deep masking orange, is at R_F 0·5; menthol neither ran nor gave a colour when sprayed. The nutmeg and smoked tobaccos were applied as light petroleum extracts, thymol and menthol as ethanolic solutions. It is possible to extract and chromatograph the dye-complex from filter paper many days after the test. The need is a suitable solvent system which eliminates toasted tobacco.

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REFERENCES

BETTS, T. J., & HOLLOWAY, P. J. (1967). *J. Pharm. Pharmac.*, **19**, 97 S–102 S.
DE FAUBERT MAUNDER, M. J. (1969 a). *J. Am. pharm. Ass., Pract. Edn.*, **7**, 24–30.
DE FAUBERT MAUNDER, M. J. (1969 b). *Bull. Narcot.*, **21** (4), 37–43.
DE FAUBERT MAUNDER, M. J. (1969 c). *J. Pharm. Pharmac.*, **21**, 334–335.
DE FAUBERT MAUNDER, M. J. (1970). *J. Am. pharm. Ass., Pract. Edn.*, **8**, 42–47.
FAIRBAIRN, J. W. LIEBMANN, J. A. & SIMIC, S. (1971). *J. Pharm. Pharmac.*, **23**, 558–559.
KORTE, F., & SIEPER, H. (1964). *J. Chromat.*, **13**, 90–98.
VAN ZYL, J. D. (1970). The International Institute on the Prevention and Treatment of Drug Dependence, Lansanna, Switzerland.

A pimozide-sensitive effect of apomorphine on body temperature of the rabbit

(+)-Amphetamine may cause hyperthermia in rabbits by promoting the release of catecholamines from neurons of the cns (Hill & Horita, 1970). Antagonism of (+)-amphetamine hyperthermia by pimozide (Hill & Horita, 1971), a selective dopamine antagonist (Anden, Butcher & others, 1970), indicated that the hyperthermia was mediated by central dopaminergic neurons. These and other considerations have led us to speculate that, by releasing dopamine from central neurons, (+)-amphetamine enhances dopamine receptor activity and consequently induces hyperthermia. Before this speculation could be considered a working hypothesis, it was necessary to determine whether the hyperthermic effect of (+)-amphetamine could be replicated by direct stimulation of central dopamine receptors. Toward this goal, we examined the effect of apomorphine, a dopamine receptor stimulant (e.g. Ernst, 1969), on body temperature of the rabbit.

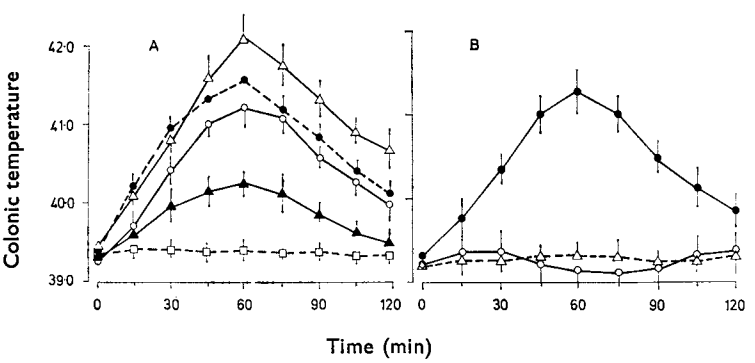

FIG. 1. A. The effect of apomorphine on the colonic temperature of rabbits. All solutions were injected via marginal ear vein at zero time. Each point represents the mean colonic temperature of 5 rabbits after the injection of isotonic saline (□); apomorphine: 1 mg/kg, (▲) 2·5 mg/kg, (○) 5 mg/kg, (△); (+)-amphetamine 5 mg/kg (●). The vertical lines indicate s.e.

B. The effect of pimozide on the time course of apomorphine-induced hyperthermia. Rabbits received an intraperitoneal injection of either dilute tartaric acid (pimozide solvent) or 4 mg/kg pimozide 3 h before injection of apomorphine (5 mg/kg, i.v.) or isotonic saline (i.v.) at zero time. Each point represents the mean colonic temperature of 5 rabbits injected with: pimozide before saline (△), solvent before apomorphine (●), or pimozide before apomorphine (○). The vertical lines indicate s.e.