Journal of Chromatography, 86 (1973) 261–262

CHROM. 6902

Note

A rapid method for detecting groundnut oil in castor oil

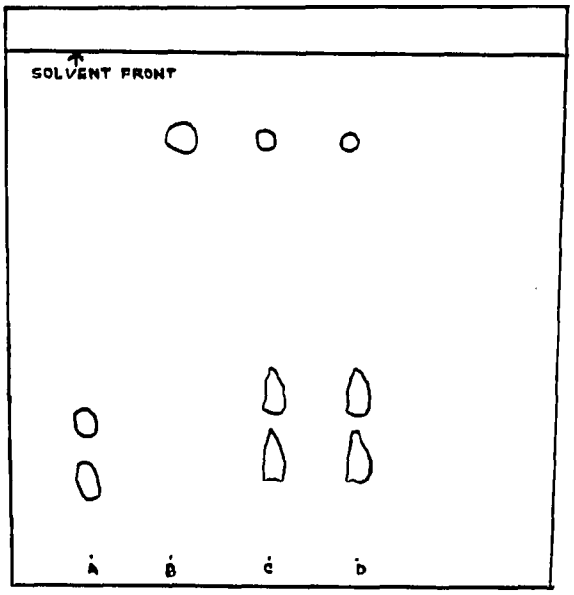
C. SRINIVASULU and S. N. MAHAPATRA
Regional Research Laboratory, Bhubaneswar-4 (India)
(Received June 25th, 1973)

Adulteration with edible oils such as groundnut oil is usually effected by mixing them with castor oil in view of the price differences and also because of the ready availability of castor oil in large amounts. Very recently, an anomalous situation has been encountered in the adulteration of castor oil with groundnut oil, as the price of the former has increased considerably. Therefore, it has become necessary to devise a rapid method of detecting the adulteration of castor oil with groundnut oil.

The detection of adulteration of various oils and fats by TLC using different solvent systems has been reported earlier[1–3], but the detection of groundnut oil in castor oil has not been reported so far. Using silica gel G layers sprayed with silver nitrate, it is possible to detect as little as 1% of groundnut oil in castor oil using benzene–ethanol–acetic acid (98.4:1.6:0.5) as the solvent system. It is also possible to detect the adulteration of castor oil by groundnut oil down to only 3% using benzene–ethyl acetate (95:5) as the solvent system.

EXPERIMENTAL AND RESULTS

Silica gel G plates (20 × 20 cm; 250 μm layers), dried for 1 h at 110° and cooled to room temperature, were sprayed uniformly with a 5% solution of silver nitrate in 50% aqueous alcohol. The plates were then dried at 110° for about 15 min. After cooling the plates to room temperature, 1% solutions of the oils in chloroform were spotted on the plates and developed using as solvent systems benzene–ethanol–acetic acid (98.4:1.6:0.5) and benzene–ethyl acetate (95:5). The plates were dried at 110° for 5 min and sprayed with 50% alcoholic phosphoric acid. The plates were then heated at 150° for about 15 min. Castor oil (A) gave two brown spots, whereas groundnut oil (B) gave one grey coloured spot when benzene–ethanol–acetic acid (98.4:1.6:0.5) was used as the solvent system (Fig. 1). With castor oil adulterated with groundnut oil, three prominent spots were observed (two brown and one grey) using the same solvent system. Spots C and D represent castor oil adulterated with groundnut oil to the extent of 1% and 3%, respectively. When benzene–ethyl acetate (95:5) was used as the solvent system, groundnut oil separated into three spots (grey coloured), whereas castor oil did not move much from the start (Fig. 2). With adulterated mixtures, as little as 3% of groundnut oil in castor oil gave two



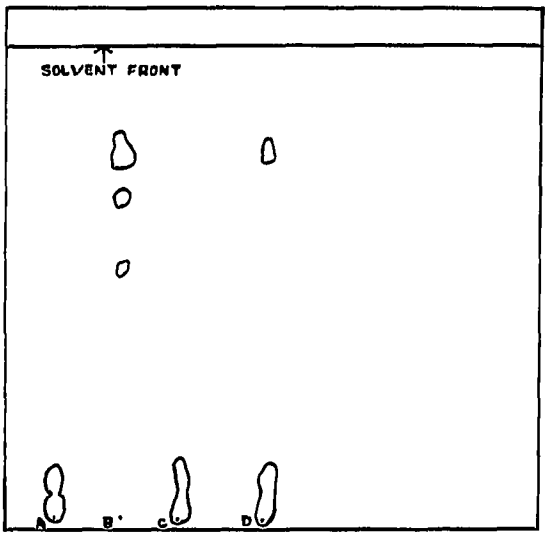


Fig. 1. Thin-layer chromatogram obtained using benzene–ethanol–acetic acid (98.4:1.6:0.5) as the eluting solvent. A = Castor oil; B = groundnut oil; C = 1% of groundnut oil in castor oil; D = 3% of groundnut oil in castor oil.

Fig. 2. Thin-layer chromatogram obtained using benzene–ethyl acetate (95:5) as the eluting solvent. A = Castor oil; B = groundnut oil; C = 1% of groundnut oil in castor oil; D = 3% of groundnut oil in castor oil.

spots (one brown and the other grey). R_F values of the spots after elution with different solvent systems are given in Table I.

TABLE I

R_F VALUES OF SPOTS AFTER ELUTION WITH DIFFERENT SOLVENT SYSTEMS

Oil	*Solvent system*	*R_F value*	*Colour of spot*
Castor	Benzene–ethanol–acetic acid (98.4:1.6:0.5)	0.14, 0.26	Brown
Groundnut		0.85	Grey
Castor	Benzene–ethyl acetate (95:5)	0.058	Brown
Groundnut		0.53, 0.68, 0.78	Grey

ACKNOWLEDGEMENTS

The authors thank Prof. P. K. Jena, Director of the Laboratory, for his interest in this work, and Mr. S. P. Rath for technical assistance.

REFERENCES

1 V. V. S. Mani and G. Lakshminarayana, *Chromatogr. Rev.*, 10 (1968) 159.
2 G. Lakshminarayana and V. V. S. Mani, *Indian J. Technol.*, 2 (1964), 320.
3 M. M. Chakrabarty, D. Bhattacharyya and B. Mondal, *Indian J. Technol.*, 1 (1963) 473.