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Note

Detection of mineral oils in edible oils by thin-layer chromatography

SUBHASH CHAND, C. SRINIVASULU and S. N. MAHAPATRA

Regional Research Laboratory, Bhubaneswar-751004, Orissa (India)

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Adulteration of common vegetable oils with cheaper mineral oils has become widespread because of the price differential. For the detection of mineral oils, the Holde test is widely used¹. TLC methods have been described for the detection of mineral oils and the spots were located with aqueous sodium fluorescein or 2',7'-dichlorofluorescein under UV light^{2,3}. In the method described here, up to 3% of adulterant mineral oils in different vegetable oils has been detected using silica gel G layers sprayed with silver nitrate solution and eluted with benzene. The spots are detected by charring with 50% ethanolic phosphoric acid.

EXPERIMENTAL AND RESULTS

Silica gel G plates (20 × 20 cm, 250- μ m layers), dried for 1 h at 110° and cooled to room temperature, are sprayed with a 5% solution of silver nitrate in 50% aqueous ethanol, then dried again at 110° for 15 mins. After cooling to room temperature, spots of the oils in chloroform (1% solution) are applied and eluted in a

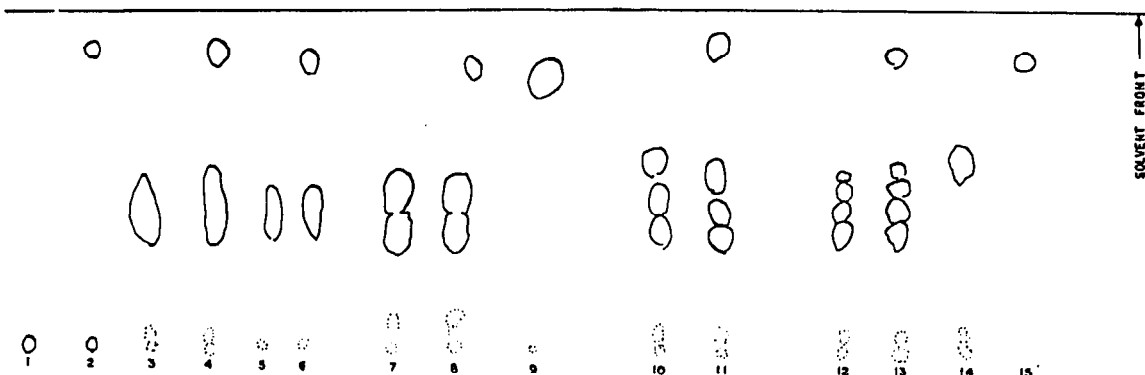


Fig. 1. Oil sample: 1, castor oil I.P.; 3, groundnut oil; 5, coconut oil; 7, mustard seed oil; 9, liquid paraffin (U.S.P.); 10, niger oil; 12, sesame oil; 14, tallow; 15, transformer oil; 2, 4, 6, 8, 11 and 13 represent castor, groundnut, coconut, mustard seed, niger and sesame oils, respectively, containing 3% of liquid paraffin.

chamber containing benzene. About 30 min are required for a run of 13.7 cm. The plates are dried in an oven at 110° for 3 min, sprayed with 50% ethanolic phosphoric acid and heated at 150° for about 15 min.

It can be seen from Fig. 1 that liquid paraffin and transformer oil have R_f values of 0.803 and 0.852, respectively. In adulterated samples, the mineral oil appears as a distinct spot.

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