Notes

Chromatographic estimation of stearoptene in Indian rose oils

The stearoptene content of a sample of rose oil is one of its imporant characteristics[1]. The United States Pharmacopoeia gives a limiting test[2] for minimum stearoptene content. Estimation[3] of stearoptene is usually carried out by chilling a solution (of 5 g) of the oil in 75 % ethyl alcohol, filtering and weighing the separated stearoptene. The method is not convenient in tropical countries and sufficient care has to be taken during filtration and subsequent estimation of stearoptene. Another disadvantage from which the method suffers is that a large quantity (5 g) of the oil is required for estimation. It was considered worthwhile to develop a simpler method for estimation of stearoptene using only a small quantity of the oil.

The stearoptene of Indian rose oils is composed of paraffin hydrocarbons. These can be successfully separated from the oil by chromatography over alumina. Fig. 1

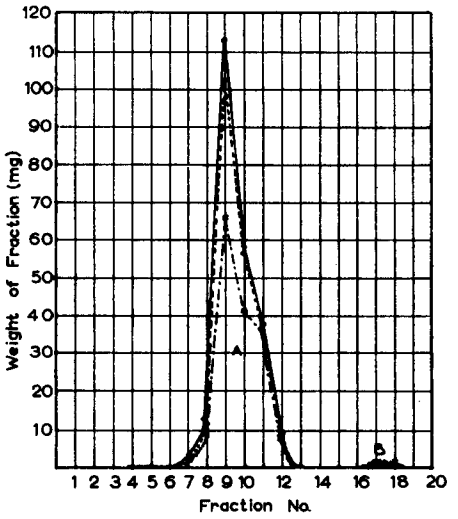

Fig. 1. Elution of stearoptene from 1 g of rose oil over 50 g grade I alumina. Volume of each fraction: 5 c.c. —o— o — oil of *Rosa damascena*; – – · – – · – – oil of *Rosa bourbonica*; · — × — · — × — · oil of rose teplitz.

shows the elution curve for 1 g each of three different types of Indian rose oils. It may be observed that 65 c.c. of the eluant carries away all the stearoptene (A). The product (B), which is present in negligible quantity, is eluted only after 80 c.c. of eluant has been collected. In the actual procedure 50 g grade I (Brockmann).

alumina is packed in a column of 18 mm diameter. A solution of 1 g of oil is adsorbed at the top of the column and eluted with hexane. 70 c.c. of the eluant is collected and evaporated in a tared flask. From the weight of the residue, the percentage of stearoptene in the oil may be calculated.

The method was verified by estimation of stearoptene in a number of samples of Indian rose oils by the conventional as well as the above chromatographic method. The results were found to compare favourably, as shown in Table I for one representative experiment with each of the three different varieties of rose oils investigated.

TABLE I

Oil sample	*Stearoptene content*	
	Conventional method %	*Chromatographic method* %
1. *Rosa damascena*	23.5	23.2
2. *Rosa bourbonica*	22.1	21.8
3. Rose teplitz	16.3	16.1

Further verification was carried out by mixing stearoptene (isolated from rose oil) and eleaoptene (stearoptene-free oil) in different known proportions and estimating the stearoptene content of the mixture by the chromatographic method. The results were found to agree within 0.4 % (Table II).

TABLE II

Oil sample	*Stearoptene content*	
	Actual content %	*Chromatographic estimation* %
1. *Rosa damascena*	15.2	15.0
	30.1	29.8
	45.1	45.0
2. *Rosa bourbonica*	15.2	14.8
	30.3	30.2
	45.2	45.1
3. Rose teplitz	15.0	14.7
	30.2	30.3
	45.2	49.9

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[1] E. GUENTHER, *The Essential Oils*, Vol. 5, D. Van Nostrand Co., Inc., New York, 1952, p. 25.
[2] *The United States Pharmacopoeia*, 13th Revision, 1947, p. 456.
[3] E. GUENTHER, *The Essential Oils*, Vol. I, D. Van Nostrand Co., Inc., New York, 1948, p. 328.

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