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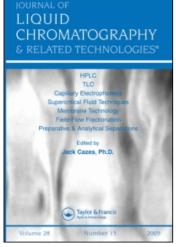
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R. Bhushan^a

^a Chemistry Department, University of Roorkee, Roorkee, India

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TLC SEPARATION AND IDENTIFICATION OF ESSENTIAL OIL CONSTITUENTS ON SILICA GEL PLATES

R. Bhushan Chemistry Department University of Roorkee Roorkee 247672 India

ABSTRACT

A chromatographic method for the separation and identification of the volatile flavouring constituents of different essential oils is reported. The essential oil was isolated from three plants by means of steam distillation and solvent extraction methods. The chromatostrips were prepared with silica gel, developed in petroleum ether and sprayed with suitable reagents when various zones were indicated and identified.

INTRODUCTION

Thin layer chromatography has been used extensively for arnica oils(1), terpenes of seaweed(2), Patchouli oil(3) and many others. The use of silicic acid CHROMATO-STRIPS for the separation of essential oil components has been described by Kirchner, Miller and Keller(4,5).

Reitsema(6) modified the procedure for peppermint oil.

Results of Micro Reactions of Essential Oil on TLC

| 011 Source | Comp oun d | 3 | UV Fluors- 2,4- Conc. ${\rm Gr}0_3$ hR cein DNP ${\rm H_2}{\rm S0_4}$ 0xid. obsvd lit(6) bromine | 2,4- ONP | Conc. H ₂ SO ₄ | CrO ₃ Oxid. | hR f obsvd | hRf lit(6) |
|---------------|------------|---|--|-------------|---|---------------------------|---------------|---------------|
| Pinus | Camphene | f | + | • | +Brown | | 84 | 89 |
| | -pinene | t | + | 1 | +Brown | | 83 | 83 |
| | 8-pinene | ı | 4 | 1 | +Purple | | 80 | 80 |
| | Limonene | | + | + | +Brown | | 41 | 40 |
| | -terpeniol | • | + | ı | +Green | | 59 | 30 |
| | Borneol | ı | + | | +Purple | | 83 | 82 |

| | 9 | 52 | 20 | 30 | | 63 | 41 | 4 5 | 36 | | |
|------------|--------------|------------|-------------|-----------|--------|------------|----------|--------|----------|---------|----------|
| | 09 | 55 | 49 | 59 | | 63 | 41 | 43 | 36 | | |
| | +Brown | +Br own | +Green | +Purple | | +Green | +Brown | +Green | 1 | Carvone | Citral |
| | • | +Orange | • | ı | | • | ı | • | 1 | | |
| | + | + ' | 1 | + | | + | + | + | + | | |
| | 1 | + | ı | 1 | | ı | ŧ | + | ı | | |
| Eucalyptus | Phellandrene | Piperitone | 1,8-Cinsole | Terpeneol | Citrus | -terpinene | Limonene | Citral | Linalool | Carveol | Geraniol |

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It is possible to carry out microreactions in order to obtain valuable clues as to the identify of a compound, on the TLC plate.

The advantages of the micro reactions on TLC may be looked into as (i) positive identification of the compound (ii) considerable time saving and requirement of a small amount of compound and, (iii) formation of a derivative, if required, may be readily checked without resorting to extensive purification, recrystallization etc.

The present communication deals with the study of essential oils of (i) Pinus longifolia Roxb., (ii) Eucalyptus citriodora Hook, and (iii) Citrus reticulata Blanco.

EXPERIMENTAL

The essential oil from above three plants was obtained. The oils were subjected to TLC on 20×10 cm² silica gel (8DH) plates of 0.25 mm thickness, using petroleum ether as developing solvent. Different locating agents were used on separate Chromatograms and the results are recorded in Table 1.

(i) \underline{P} . longifolia: The Pinus oleoresin was collected (60 g.) by chipping the tree at about 3-4 feet height and making an incision 3-4 inches deep. The steam distillation of oleoresin gave an oil (10 ml). Refractive index of the oil at 26° C was found to be 1.389, lit(7), 1.4691.

It was interesting to note that the Pinus wood rosin (residue after isolation of oil) gave positive tets for protein and not the carbohydrates. The protein hydrolysed by 6N HCl in a sealed glass tube at 140° for 18 hrs and subsequent paper chromatography in BuOH-AcOH-H₂O (4:1:5) followed by spraying with ninhydrin (0.2 percent in acetone) showed the presence of five amino acids viz. His, Ala, Met, Ile and Try.

- (ii) E. citriodora: Finely divided leaves (250 g) were extracted with petroleum ether $(40^{\circ}-60^{\circ})$ at room temperature for 3 hours and the petroleum ether was removed under reduced pressure at 45° to give the oil (12 ml). The oil was found to contain phellandrine and the cineole content by phosphoric acid method (8) was found to be 60 percent. Refractive index of the oil at 26° was 1.4710, lit(8), 1.4600 at 20° .
- (iii) <u>C. reticulata</u>: The fresh <u>C.reticulata</u> peels (500 g) were cut into small pieces, grounded and subjected to steam distillation. The oil was dried with anhydrous sodium sulphate (15 ml). Refractive index of the oil at 26°C was 1.403, lit(7), 1.475.

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