

# Analysis of the Essential Oil of *Vateria Indica* Linn

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*Vateria indica* Linn. (Syn. *V. malabarica* and *Chloroxylon dupada*) belongs to the natural order *Dipterocarpaceae*. It is distributed in the forests on the western mountain slopes of India at elevations up to 4000 feet. Various parts of the plant are used for curing different ailments.<sup>1,2</sup> The oleoresin is used as fragrance in paints, varnishes and ointments. It is also used as a stimulant, dressing for carbuncles, and other ulcerations.

Prior to the investigations of the present authors, Dutt reported the physicochemical constants of the essential oil from oleoresin.<sup>3</sup> Thus far the oil has not been completely analysed. In the present investigations the authors have made an attempt to analyse the essential oil extracted from the oleoresin of *Vateria indica*.

## Experimental

The oleoresin, when extracted by water and steam distillation, yielded a yellowish brown coloured essential oil of 1.5% with the following physicochemical constants:  $d_{25}^{25}$  0.9260;  $n_D^{25}$  1.5196;  $(\alpha)_D^{25} + 6.4'$ ; acid value 7.20; saponification value 20.50; saponification value after

acetylation 41.51.

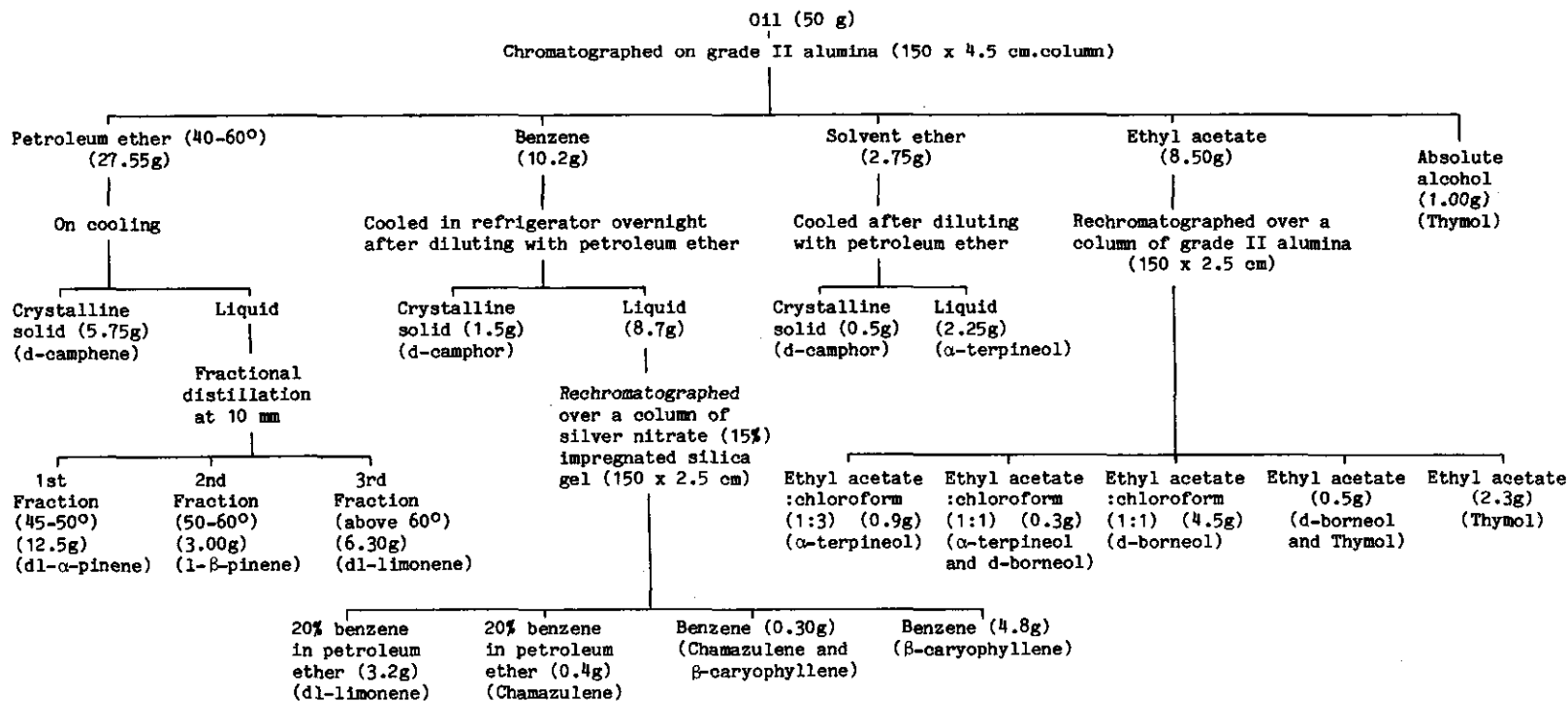
The gas liquid chromatogram of the essential oil was recorded on a gas liquid chromatograph with a silicone oil column (8' on 25% carbowax 20 M) with nitrogen as carrier gas. It has shown ten peaks. The essential oil (50g) was then chromatographed over a column of grade II alumina (2000g). It was successively eluted with various solvents and the results are given in the flow diagram. 25-50 ml fractions were collected and the fractions of similar Rf values in TLC were mixed together.

Physical constants and chemical methods are used for identifying the components of the oil besides co-TLC, co-GLC and for comparing IR spectra with that of corresponding authentic specimen. These are the physical constants observed and the chemical methods used.

d-camphene: m.p. 52°C;  $(\alpha)_D^{30} + 99'$ ; hydrated to give isoborneol (m.p. 212°C)

dl- $\alpha$ -pinene: b.p. 155°C;  $(\alpha)_D^{30} \pm 0$ ; oxidised to pinonic acid (m.p. 67°C)<sup>4</sup>

l- $\beta$ -pinene: b.p. 162°C;  $(\alpha)_D^{30} - 21.4'$ ; oxidised to nopinic acid (m.p. 126°C)

Fractionation of the essential oil of *Vateria indica*

dl-limonene: b.p. 176°C;  $(\alpha)_D^{30} \pm 0$ ; dihydrochloride (m.p. 49-50°C) and dihydrobromide (m.p. 64-65°C) are prepared

d-camphor: m.p. 179°C;  $(\alpha)_D^{30} + 43.36'$ ; oxime is prepared (m.p. 116°C)

chamazulene: b.p. 159°C; blue colour with E. P. reagent<sup>5</sup>

$\beta$ -caryophyllene: b.p. 122°C/10 mm;  $(\alpha)_D^{30} - 9.33'$ ; nitrosite was prepared (m.p. 112°C)

$\alpha$ -terpineol: b.p. 105°C/10 mm;  $(\alpha)_D^{30} \pm 0$ ; nitrosochloride was prepared (m.p. 118°C)

d-borneol: b.p. 105°C/10 mm;  $(\alpha)_D^{30} + 37'$ ; oxidised to camphor

thymol: m.p. 48-49.5°C; colour reaction with alcoholic ferric chloride and warming with acetic acid and concentrated sulphuric acid<sup>6</sup>

### Summary

Water and steam distillation of the oleoresin of *Vateria indica* yielded a yellowish brown coloured essential oil of 1.5%. The oil has been

found to contain d-camphene (11.5%), dl- $\alpha$ -pinene (25%), l- $\beta$ -pinene (6%), dl-limonene (19%), chamazulene (1%),  $\beta$ -caryophyllene (10%), d-camphor (4%),  $\alpha$ -terpineol (6.5%), d-borneol (10%), and thymol (7%).

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