

- (3) Youngken, Heber, "Textbook of Pharmacognosy," P. Blakiston's Son and Co. (1930).
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THE VOLATILE OIL OF HYPTIS MUTABILIS.*¹

BY HAROLD W. WERNER.²

The plant, *Hyptis mutabilis* (L. C. Rich) Briquet, is widely distributed in Florida. It is not, however, generally recognized by the above name, but by the name *H. spicata* (1).

Material for this investigation was collected near Gainesville, Florida. All the plants were apparently of the same race; however, at the time of collection the material was separated into that having green stems and that having reddish stems. The two batches of plant material produced oils which appeared to be identical.

Peckholt (2) and Schimmel & Co. (3) evidently worked with different races of *H. mutabilis* as their oils differed somewhat from the oils produced by the writer. Epling (1) states that several races of the species can be recognized.

RED-STEMMED MATERIAL.

Two hundred and four Kg. of green plant yielded by steam distillation 25 Gm., or 0.012%, of a dark greenish oil with a faint mint-like odor and an after-taste resembling oil of cassia.

The constants of the oil were: 1 volume soluble in 1 to 3 volumes of alcohol, 1 volume insoluble in 4 volumes of alcohol, d_{25}^{25} 0.8939, n_D^{26} 1.4925, 0% ketones with NaHSO₄, 9% ketones with Na₂SO₄, 0% phenols with 4.3% NaOH. $-12\frac{1}{2}^{\circ}$ C. did not cause the separation of solid matter. A solution of the oil in CCl₄ was levorotatory.

GREEN-STEMMED MATERIAL.

Two hundred and thirty Kg. of green plant material yielded 46 Gm., or 0.02%, of a dark greenish oil with an odor and taste identical with that of the oil produced from the red-stemmed material.

The constants of the oil were: 1 volume soluble in 1 to 3 volumes of alcohol, 1 volume insoluble in 4 volumes of alcohol, d_{25}^{25} 0.8959, n_D^{26} 1.4924, acid number negligible, saponification value 7.28, saponification value after acetylation 35.21. $-12\frac{1}{2}^{\circ}$ C. did not cause the separation of solid matter. The optical rotation of 4 cc. of oil with 6 cc. of CCl₄ in a 100-mm. tube was -4.18 .

Fractionation.—Twenty Gm. of the oil were fractionated four times under atmospheric pressure. Results are shown in the accompanying table.

DATA FOR FRACTIONS.

No.	Boiling Temp. ° C.	d_{23}^{23} .	n_D^{23} .	Gm.
1	160-180	0.8522	1.46874	4.5
2	180-247	0.8800	1.48414	2.5
3	247-263	0.9103	1.49974	6.6
Residue				

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Fraction No. 1 was refractionated and 3 cc. were obtained which boiled between 162–164°. The d_{20}^{20} was 0.8426 and n_D^{23} 1.46244. The constants of this fraction indicate the presence of sabinene. The amount of material precluded further investigation.

Fraction No. 3 was treated with 70% alcohol to purify somewhat the hydrocarbons present. The residue amounting to 6 Gm. boiled at 255–259°. The d_{20}^{20} was 0.9088 and n_D^{24} 1.49584. The constants of this fraction indicate caryophyllene. Derivatives could not be obtained because of the small amount of material.

SUMMARY.

The above ground portion of *Hyptis mutabilis* yields from 0.012% to 0.02% of a volatile oil, constants of which have been obtained. Oils from the red- and green-stemmed plants are evidently identical. The oil has a high hydrocarbon content and the presence of sabinene and caryophyllene is indicated.

REFERENCES.

- (1) Epling, C., Letter to the writer, 1931.
- (2) Peckholt, *Ber. deut. pharm. Ges.*, 14, 376 (1904); *via* Finnemore, "The Essential Oils," p. 802 (1926).
- (3) Schimmels' Report, page 96 (April 1904).

PHYTOCHEMICAL NOTES.

FROM THE LABORATORY OF EDWARD KREMERS.

NO. 113. THE STEROL FROM PINUS SABINIANA.

BY OLE GISVOLD.

The nonsaponifiable material obtained by J. Semb upon saponification of the fatty oil extracted from the seed of the Digger's pine had been turned over to Kurt Bonstedt. By the digitonin method he isolated a sterol which, however, was contaminated by hydrocarbon material as became apparent in the attempt to recrystallize it. Purification of the sterol was effected by allowing it to crystallize from its alcoholic solution. The paraffin which separated with the sterol upon cooling was brought into solution by gently heating the mass for a few moments. As soon as this had been accomplished the sterol crystals were removed by suction filtration. They melted at 137.5° and the acetate melted at 127.5°.

Inasmuch as the mother liquid containing the hydrocarbon also contained some sterol, this was separated by the digitonin method. The digitonide obtained was mixed with sand and the mixture extracted with ether for several hours to remove the hydrocarbons. This accomplished the digitonide was resolved into its components with boiling xylene. The sterol thus obtained revealed the same melting point as that recorded above, the melting point of its acetate also corresponded with that given above.¹

The sterol contained in the fatty oil from the seeds of *Pinus sabiniana*, therefore, appears to be a sitosterol.

Dr. Roy Gardner closed his remarks before the Australian and New Zealand Association for the Advancement of Science (1935) by saying "Pharmacy as a field of work dealing with health has its own responsibility and a share of the general responsibility for watching the growth of science, and seeing that the world makes a right use of it for the benefit of mankind."

¹ Windaus, A., *Z. physiol. Chem.*, 65, 110 (1910).