M.p., mixed m.p., IR, NMR. *Glycerides of fatty acids.* Acid part consists of C_{24}-C_{32} straight-chain saturated fatty acids. Identified by GLC of methyl esters. *Unidentified compound.* (*A*) $C_{30}H_{50}O$, m.p. ~ 50°, IR ν^{KBr} 3400, 1030, 812 cm^{-1}, NMR $\delta^{TMS}_{CDCl_3}$ 0·75 (3H,s), 0·81 (3H,s), 0·86 (3H,s), 0·88 (3H,d, $J = 6·3$), 0·97 (6H,s), 1·60 (3H,s), 1·68 (3H,s), 3·25 (2H,m), 5·09 (1H,m), 5·25 (1H,m), benzoate, m.p. 144–145°, IR.

Acknowledgements—Thanks are due to Professor Y. Kitahara, Tohoku University, for the sample of cycloartenol.

Phytochemistry, 1971, Vol. 10, pp. 3309 to 3310. Pergamon Press. Printed in England.

LABIATAE

ESSENTIAL OIL FROM THE LEAVES AND INFLORESCENCE OF *OCIMUM GRATISSIMUM*

M. SAINSBURY
School of Chemistry and Chemical Engineering, Bath University, Claverton Down, Bath
and
E. A. SOFOWORA
Department of Pharmacognosy and Drug Research Unit University of Ife, Ile-Ife, Nigeria

(*Received* 28 *May* 1971)

Plant. Ocimum gratissimum L. Indigenous to Nigeria.

Previous studies. Major component of oil from specimens collected in Taiwan has been shown[1] to be eugenol (62%). This compound is the major component of the oil obtained from the leaves of a hybrid between *O. gratissimum* and *O. menthaefolium.*[2] The Nigerian *O. gratissimum* was reported[3,4] to contain thymol, but no eugenol. The remaining components of the oil from the Nigerian plant are reported here.[5]

RESULTS

Composition of oil from leaves (%):—α-pinene (2·6), camphene (4·0), β-pinene (0·6), α-terpinene: Δ^3-carene (4·1), myrcene (1·4), 1,8-cineole (1·1), α-terpinene (6·2), *p*-cymene (16·2) limonene (1·8) camphor (0·6), linalool (0·2), α-terpineol (2·4), $C_{10}H_{22}O$ (2·3), thymol (47·6), methyleugenol (1·7), methylisoeugenol (trace), caryophyllene (2·1), humulene (0·5), β-selinene (1·6), longifoline (3·0), clovene (trace). Oil from the flowers has essentially the same composition except the proportion of camphene is reduced.

[1] PING-HSIEN YEH, *Perfumery Essent. Oil Record.* **51,** 611 (1960).
[2] O. K. MADALSKA, C. BANKOWSKI and J. KUDUK, *Acta. Polon. Pharm.* **21,** 387 (1964).
[3] F. EL-SAID, E. A. SOFOWORA, S. A. MALCOLM and A. HOFER, *Planta Med.* **17,** 195 (1969).
[4] E. A. SOFOWORA, *Planta Med.* **18,** 173 (1970).
[5] M. QUDRAT-I-KHUDA, M. ERFAN ALI, A. KHALIQUE and L. A. M. SHAMSUZZAMAN, *Sci. Res.* (Dacca, Pakistan) **1,** 217 (1964).

EXPERIMENTAL

The oils were obtained by steam distillation of freshly gathered leaves and flowers collected at the onset of flowering. Analysis was by GLC and GLC–MS (Column conditions: 15% carbowax 20 M on chromosorb W, 15% *Apiezon* L. on Universal B and 5% SE 30 gum rubber on Universal B. *Instrumental.* Pye 104 gas chromatograph coupled to MS 12 Mass-spectrometer). Individual compounds were characterized by direct comparison with the retention indices and fragmentation patterns of authentic specimens.

Acknowledgements—The authors thank the following colleagues for gifts of terpenoids: Dr. J. Belsten (Proprietory Perfumes Ltd., Kent), Dr. A. Weaving (Imperial Tobacco Company, Bristol) and Mr. J. Cheshire (Beechams Ltd., Middlesex). E. A. Sofowora is indebted to the University of Ife for a grant to research into Nigerian Medicinal Plants.

Phytochemistry, 1971, Vol. 10, p. 3310. Pergamon Press. Printed in England

LAURACEAE

n-PARAFFINS FROM THE LEAVES OF THREE GENERA OF LAURACEAE

H. KOMAE and N. HAYASHI

Department of Chemistry, Faculty of General Education, Hiroshima University, Hiroshima, Japan

(*Received* 17 *March* 1971)

Abstract—*n*-Paraffins ranging from C_{16} to C_{33} were detected by gas chromatography from the leaves of *Cinnamomum camphora* Sieb., *Lindera obtusiloba* Blume, *Litsea japonica* Juss.).

Plants. Cinnamomum camphora Sieb., *Lindera obtusiloba* Blume, *Litsea japonica* Juss.

Occurrence. Hiroshima Prefecture, Japan.

Previous work. No work (concerning paraffin constituents).

Date. Cinnamomum camphora Sieb. (January 1971), *Lindera obtusiloba* Blume and *Litsea japonica* Juss. (September 1970).

Leaves. Crushed to pieces and extracted with *n*-hexane. Purification (column chromatography and molecular sieve 5A treatment).[1] Identification (GLC using two columns, SE-30-5%, Apiezon grease L-5%, column temperature 150–300°). The odd paraffins are in large amount (*Cinnamomum, Lindera, Litsea* are 84·2, 88·6, 57·9%, even ones are 13·8, 11·4, 42·1% respectively).

n-*Paraffins. Cinnamomum camphora* Sieb.: C_{16-19} (trace), C_{20}(0·2%), C_{21}(0·5), C_{22}(0·8), C_{23}(2·6), C_{24}(2·4), C_{25}(7·1), C_{27}(23·9), C_{28}(4·3), C_{29}(43·3), C_{30}(1·2),C_{31}(8·8), C_{32-33}(trace), *Lindera obtusiloba* Blume: C_{16}(1·1), C_{17}(0·3), C_{18}(1·3), C_{19}(0·4), C_{20}(1·3), C_{21}(0·4), C_{22}(1·3). C_{23}(1·4), C_{24}(1·3), C_{25}(3·9), C_{26}(1·9), C_{27}(25·6), C_{28}(1·6), C_{29}(45·1), C_{30}(1·6), C_{31}(11·5), C_{32-33}(trace). *Litsea japonica* Juss.: C_{19-22}(trace). C_{23}(0·6), C_{24}(2·1), C_{25}(3·4), C_{26}(7·0), C_{27}(14·4), C_{28}(18·8), C_{29}(23·8), C_{30}(14·2), C_{31}(14·8), C_{32}(trace), C_{33}(0·9).

[1] N. Y. CHEN and S. J. LUCKI, *Analyt. Chem.* **42**, 508 (1970).