

HYDROXYPHENYLALKANONES FROM *AMOMUM MELEGUETA**

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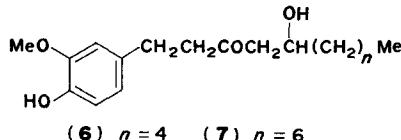
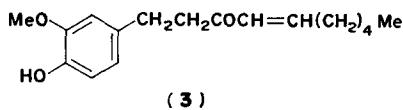
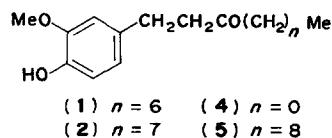
(Received 18 October 1974)

Key Word Index—*Amomum melegueta*; Zingiberaceae; hydroxyphenylalkanones; zingerone; (6)-paradol; (6)-shogaol; (7)-paradol; (8)-paradol.

Plant—*Amomum melegueta* Roscoe (Zingiberaceae), also known as Grains of Paradise, Guinea pepper or Melegueta pepper. Voucher specimens are on deposit at the Faculty of Pharmacy, University of Science and Technology, Kumasi, Ghana. Source—Ghana. Uses—Spice [1]. Previous work—On the hydroxyphenylalkanones of seeds from equatorial Africa [2]. On the terpenoid constituents of *A. korarima* [3], *A. subulatum* [3], *A. cardamomum* [4], *A. globosum* [4].

Present work. The powdered seeds (150 g) of *A. melegueta* were macerated with Me_2CO . TLC of the extract concentrate (7.5 g) over Si gel with C_6H_6 revealed the presence of five spots [R_f 's 0.94, 0.72, 0.47 (trace), 0.28 and 0.09] (KMnO_4 spray). Column chromatography of the concentrate over silicic acid (200 g) with light petroleum and light petroleum- C_6H_6 mixtures afforded the less polar terpenoid hydrocarbon constituents. Elution with C_6H_6 and $\text{C}_6\text{H}_6-\text{CHCl}_3$ mixtures afforded a yellow oil (1.49 g) (R_f 0.28) which stained deep blue with phosphomolybdic acid spray + NH_3 . GLC of the oil on a 160 cm column of 3% OV-17 on Gas Chrom Q (80–100 mesh) showed the presence of 3 major compounds. GLC-MS of the oil revealed

that the 3 compounds had M^+ m/e 278, 276 and 292 respectively and accounted for 33, 38 and 29% of the mixture.



Careful rechromatography of the oil over silicic acid (50 g) and elution with C_6H_6 afforded (6)-paradol (1) (M^+ m/e 278) (UV, IR, NMR, MS). Further elution with C_6H_6 and $\text{C}_6\text{H}_6-\text{CHCl}_3$ mixtures afforded mixtures of (6)-paradol (1) (M^+ m/e 278) and (7)-paradol (2) [M^+ m/e 292 (13%), 194 (2), 179 (4), 151 (4), 137 (100) and 119 (3)] while elution with $\text{C}_6\text{H}_6-\text{CHCl}_3$ mixtures and CHCl_3 afforded (6)-shogaol (3) (M^+ m/e 276) (UV, IR, NMR, MS). Finally, trace amounts of zingerone (4) and (8)-paradol (5) were detected (GLC-MS) in various column fractions. In summary, the 3 major hydroxyphenylalkanones of the Me_2CO extract of

* Part VIII in the series "Constituents of West African Medicinal Plants". For Part VII see Tackie, A. N., Dwuma-Badu, D., Ayim, J. S. K., Dabra, T. T., Knapp, J. E., Slatkin, D. J. and Schiff, P. L., Jr. *Lloydia*, Submitted for publication.

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‡ The number in parentheses represents the number of C atoms in the aldehyde which would be generated by a retro-aldol reaction on the gingerol (6). Cf. [2].

Ghanian Grains of Paradise are (6)-paradol (**1**), (7)-paradol (**2**) and (6)-shogaol (**3**), the second of which, to our knowledge, has not previously been reported in nature. In an earlier study [2], the hydroxyphenylalkanones from equatorial African Grains of Paradise were examined; in this case (6)-gingerol (**6**) and (6)-paradol (**1**) were the major constituents with trace quantities of (6)-shogaol (**3**), (8)-gingerol (**7**) and (8)-paradol (**5**) [2]. However no gingerols were detected in our extract. Obviously, chemical variation in the seeds of *A. melegueta* from different sources needs further examination.

Acknowledgements—The authors are grateful to Prof. H. D. Lockley, Department of Chemistry and Applied Chemistry, University of Salford, England for samples of (6)- and (8)-para-

dols and spectra of zingerone and (7)-paradol; Mr. John Naworal, Graduate School of Public Health, University of Pittsburgh for determining the MS. This investigation was supported in part by a grant from the African-American Scholars Council and by Research Grant 5S01RR05455-10 from the National Institutes of Health, Education and Welfare, Bethesda, Maryland 20014, U.S.A. The mass spectrometer facility was supported by Research Grant RR-00273 to the University of Pittsburgh from the National Institutes of Health.

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