

Phytochemistry, 1973, Vol. 12, p. 1831. Pergamon Press. Printed in England.

TRITERPENOIDS OF *GARDENIA TURGIDA*

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(Received 23 February 1973. Accepted 16 March 1973)

Key Word Index—*Gardenia turgida*; Rubiaceae; sitosterol; oleanolic acid; gypsogenic acid; hederagenin.

Plant. *Gardenia turgida* Roxb. *Use.* For indigestion in children¹. *Previous work.* D-Mannitol² from exudate.

Present work on wood and bark. Both gave the same components, though in different yields. (i) *Sitosterol* from petrol. extract by chromatography over silica gel, (ii) D-Mannitol from alcohol extract (deposition of crystals). From mother liquor by concentration, hydrolysis and separation into neutral and acid genins, the following substances: From neutral genin fraction *sitosterol* by chromatography over silica gel. The acid genin fraction after treatment with CH₂N₂ and chromatography over silica gel yielded: (a) an *unknown triterpenoid* in traces. C₃₂H₄₈O₅ (M⁺, 512), m.p. 258–260°, [α]_D +49.2° (c 0.61, CHCl₃); IR. (2941, 1721, 1449, 1377, 1355, 1235, 1163, 1114, 893, 876, 847 and 820 cm⁻¹); MS. 512 (M⁺, 46), 497 (5), 453 (13), 452 (10), 263 (40), 262 (100), 203 (99), 202 (40), 189 (33) and 133 (21); (b) *Oleanolic acid methyl ester* (m.p., m.m.p., TLC and IR); (c) *Gypsogenic acid methyl ester*; (d) *Hederagenin methyl ester*. (c) and (d) were characterized by m.p., specific rotation, elemental analysis, IR, NMR, MS and by reduction with LAH to hederagenin triol of known m.p. and specific rotation.

Acknowledgements—The authors thank the Central Council for Research in Indian Medicine and Homoeopathy for financial assistance, Dr. Nitya Nand, Central Drug Research Institute, Lucknow for the MS and Professor T. R. Seshadri F.R.S., for his kind interest.

¹ NADKARNI, A. K. (1954) *Indian Materia Medica*, Vol. 1, p. 569, Popular Books, Bombay-7.

² FORSTER, M. O. and RAO, K. A. N. (1925) *J. Chem. Soc.* 127, 2176.

Phytochemistry, 1973, Vol. 12, pp. 1831 to 1832. Pergamon Press. Printed in England.

MURRAYANINE AND DENTATIN FROM *CLAUSENA HEPTAPHYLLA**

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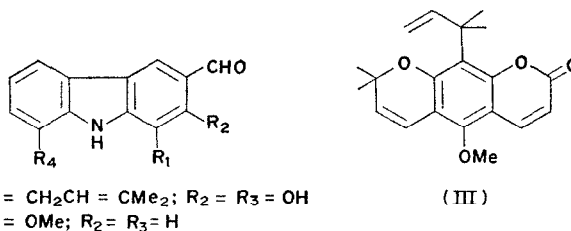
(Received 13 February 1973. Accepted 5 March 1973)

Key Word Index—*Clausena heptaphylla*; Rutaceae; alkaloid; murrayanine; coumarin; dentatin.

From taxonomic interest, we undertook the examination of *Clausena heptaphylla* (Rutaceae, sub-fam. Aurantiae) from which we reported the isolation and structure proof of a new

* Part XXXIII in the series Chemical Taxonomy for Part XXXII CHAKRABORTY *et al.* *Chem. Ind. (London)* in press.

carbazole alkaloid heptazoline,¹ $C_{18}H_{17}NO_2$ (I), m.p. 212–214°. We now report the isolation of another carbazole alkaloid, $C_{14}H_{11}NO_2$, m.p. 168° and a coumarin, $C_{20}H_{22}O_4$, m.p. 90–92°. The carbazole alkaloid has been identified as murrayanine² (II) and the coumarin, as dentatin (III).³



The neutral fraction of the benzene extract of the roots of *Clausena heptaphylla* after careful chromatographic work up, furnished a crystalline nitrogenous constituent, $C_{14}H_{11}NO_2$, m.p. 168–170° which readily gave a 2:4 DNPH derivative. The IR spectrum of the compound showed the presence of $-NH-$ and aldehyde functions on an aromatic system (ν_{max}^{Nujol} 3150, 1681, 1630, 1575). The UV spectrum of (II) ($\lambda_{max}^{Ethanol}$ 238, 274, 287, 335 nm with log ϵ 4.45, 4.30, 4.50, 4.55 and 4.15) was superimposable with that of murrayanine. The physical and analytical data were suggestive of the identity of the compound with murrayanine which was confirmed by the direct comparison with pure murrayanine (m.m.p., TLC and UV, IR). The IR (ν_{max}^{Nujol} 1720, 1610, 1590) and UV spectra ($\lambda_{max}^{Ethanol}$ 230, 270, 330 nm with log ϵ 4.31, 4.36 and 4.02) of the compound (III) are consistent with a coumarin structure. The physical and analytical data are suggestive of the identity of the compound with dentatin which has been confirmed by direct comparison (m.m.p., IR, UV, TLC).

The presence of the constituents (II) and (III) in *Clausena heptaphylla* is taxonomically rational. Previously murrayanine (II) was reported from *Murraya koenigii* Spreng. and dentatin (III) *Clausena dentata*³ which are taxonomically close to *Clausena heptaphylla*.

Acknowledgements—The authors thank Professors S. M. Sircar, Ph.D., Director, Bose Institute and A. Sen, Head of the Department of Chemistry for their interest in the work. The gift of the sample of dentatin from Dr. B. S. Joshi, of C.I.B.A., Research Centre, Bombay is gratefully acknowledged.

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