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SHORT COMMUNICATION

MANSONONE C IN ELM WOOD

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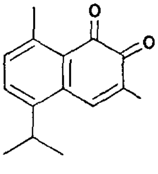
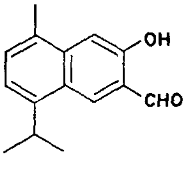
IT HAS been found[1] recently that young branches of Ulmus ***hollandica*** (Ulmaceae) produce mansonones E and F after inoculation with ***Ceratocystis ulmi.*** Previously mansonones (there are 10)’ had been found only in ***Mansonia*** wood (Sterculiaceae). In view of this we wish to report the existence of mansonone C (I) as a normal constituent of the heartwood of ***U. glabra.*** This seemed to us likely when the hydroxynaphthaldehydes (II) and (III) were discovered[3] in this wood, as all three compounds have the same cadalene skeleton and a similar oxidation level, and in fact extraction of ***glabra*** heartwood with light petroleum yielded (I), (II) and (III). Synthetic (I), obtained from **7-hydroxycadalene** by oxidation with Fremy’s salt, was identical with the natural pigment.

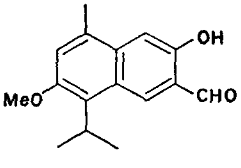
7-Hydroxycadalene is also present[3] in ***U. glabra*** and ***U. rubra*** and may be a biogenetic intermediate, nuclear or side chain oxidation leading to (I) and (II), respectively. Further investigation of ***Ulmus*** and ***Mansonia*** heartwoods may reveal other examples of the co-existence of naphthaldehydes and naphthaquinones. The methoxyaldehyde (III) is the analogue of mansonone G, while (IV) (another constituent of ***U. glabra*** and ***U. rubra***)[3] corresponds to mansonone B. Since our isolation of mansonone C from ***U. glabru we*** understand that Dr. J. W. Rowe[4] has found the same quinone in several ***Ulmus*** spp.



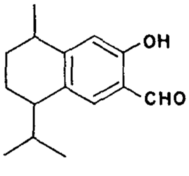
(I)



(II)



(III)



(IV)

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[1] J. C. OVEREEM and D. M. **ELGERSMA,** ***Phytochem.* 9,** 1949 (1970).

[2] G. B. **MARINI-BETTÒLO,** C. G. **CASINOVI** and C. **GALEFFI,** ***Tetrahedron Letters 4857 (1965); N.*** TANAKA, M. **YASUE** and H. IMAMURA, ***Tetrahedron Letters 2767 (1966);*** K. **SHIMADA,** M. **YASUE** and H. **IMAMURA,** ***J. Japan Wood Res. Soc.*** 13,126 (1967); C. GALEFFI, E. M. **DELLE** MONACHE, C. G. **CASINOVI** and ***G.*** B. **MARINI-BETTÒLO,** ***Tetrahedron Letters 3583 (1969).***

[3] B. 0. **LINDGREN** and C. M. **SVAHN,** ***Phytochem. 7, 1407 (1968);*** M. **FRACHEBOUD,** J. W. ROWE, R. W. **SCOTT,** S. M. FANEGA, A. J. **BUHL** and J. K. TODA, ***Forest Prod. J.* 18, 37 *(1968).***

[4] J. W. ROWE, personal communication (1968).

EXPERIMENTAL

Isolation of Mansonone C

Shavings (40 g) of *U. glabra* heartwood were exhaustively extracted (Soxhlet) with light petroleum (b.p. 60–80°). Removal of the solvent left a pale yellow oily residue which was chromatographed on a silica gel column. Successive elution with light petroleum, light petroleum-benzene (10: 1 to 1: 1, v/v) and benzene, gave, respectively, oily residues which were discarded, mixtures of the naphthaldehydes (II) and (III), and mansonone C. Further chromatography afforded pure (II) (25 mg) and (III) (10 mg). Mansonone C was purified by PLC on silica gel-3% oxalic acid in $CHCl_3$ and crystallised from aq. ethanol as orange-yellow rods, m.p. 134-135" (2 mg), identical with a sample from *Mansonia altissima.* On a larger scale 20 mg of mansonone C were obtained from 500 g of heartwood. The sapwood contained (II) and (III) but no mansonone C, and none of these was present in the bark.

Cadalene-7,8-quinone (I)

7-Hydroxycadalene (0·5 g) in methanol (200 ml) was treated with Fremy's salt (3 g) and KH_2PO_4 (1·5 g) in water (200 ml). After 1 hr more water was added, the quinone was extracted with ethyl acetate and crystallised from methanol as orange rods, m.p. 135-137" (lit.[5] 135-136") (30%) (Found: C, 78.4; H, 7.2. Calc. for $C_{15}H_{16}O_2$, C, 78.9; H, 7·1%) identical (mixed m.p., UV, IR, TLC) with mansonone C.

Acknowledgements-*We* thank Dr. C. G. Casinovi for a specimen of mansonone C and Dr. M. D. Sutherland for a generous sample of 7-hydroxycadalene.

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[5] R. G. LINDAHL, *Ann. Acad. Sci. Fennicae* AII, No. 48, 7 (1953).