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# ISOLATION OF PYRROLE-2,3,4-TRICARBOXYLIC ACID AND PYRROLE-2,3,4,5-TETRACARBOXYLIC ACID FROM SEPIOMELANIN OXIDATION PRODUCTS

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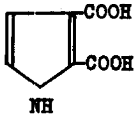
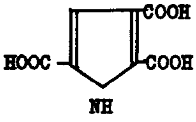
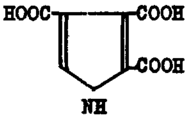
IT is known that only two pyrrolic acids, namely pyrrole-2,3-dicarboxylic acid (I)[1] and pyrrole-2,3,5-tricarboxylic acid (II)[2] have been isolated from the products obtained by oxidation of sepiomelanin with hydrogen peroxide in alkaline solution. More recently pyrrole-2,3,4,5-tetracarboxylic acid (IV) was identified by paper chromatography after degradation with hydrogen peroxide in acetic acid[3].



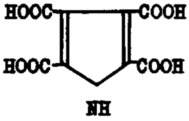
I



II



III



IV

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[1] R.A. Nicolaus, private communication.

[2] L. Panizzi and R. Nicolaus, Gazz.Chim.Ital. **82**, 435 (1952).

[3] R.A. Nicolaus, A. Vitale and M. Piattelli, Rend.Acc.Sc.Fis. e Mat. **XXV**, 220 (1958).

The product to be expected from the structure assigned to melanins by Harley-Mason,[4] pyrrole-2,3,4-tricarboxylic acid (III), was never recognized.

In pursuing our work concerned with the elucidation of sepiomelanin structure, we succeeded in isolating both pyrrole-2,3,4-tricarboxylic acid and pyrrole-2,3,4,5-tetracarboxylic acid from the mixture of oxidation products of sepiomelanin; however, it should be emphasized that the former was obtained in extremely low amount.

Sepiomelanin was oxidized with hydrogen peroxide in acetic acid at room temp. for 12 days. Excess hydrogen peroxide was destroyed by adding sulphur dioxide and the previously concentrated solution was extracted with ether.

A partially purified mixture of III and IV was obtained by counter-current distribution between water and ether (150 stages), which removed I, II and part of the remaining oxidation products. This mixture was further purified by successive paper chromatographic separations (Whatman 3MM) using first propanol-ammonia-water (60:30:10) and then butanol-acetic acid-water (60:15:25) as solvents. The zone containing III and IV was eluted with water, the acid IV was precipitated as monopotassium salt by KCl addition and from the mother liquors the acid III was isolated by paper electrophoresis (electrolyte: pyridinium acetate 0.05 M). The acid IV was obtained from the potassium salt by a strongly acidic ion exchange resin.

These acids were identified by comparing their infra-red spectra, chromatographic and electrophoretic behaviour with those of authentic specimens.

Further details will be published elsewhere.

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[4] R.I.T. Cromartie and J. Harley-Mason, Biochem.J. **66**, 713 (1957).