whereas the physiological role of the hydrolase is mainly limited to the dissimilation of 3-methylcatechol and its metabolic precursors, namely *o*- and *m*-cresol. The coexistence of these two different branches in the metabolism of catechol and 4-methylcatechol, which at first sight may appear redundant, is a consequence of the low specificity of induction and action of the enzymes of the *meta*-cleavage pathway in this strain.

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Desulphation of L-Fucose Monosulphates by an Enzyme from *Patella vulgata*

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It was demonstrated earlier that sulphatase-containing preparations from the viscera of *Patella vulgata* were active against mono- and oligosaccharide sulphate mixtures derived from fucoidin (from *Fucus vesiculosus*) by graded acid hydrolysis (Lloyd & Lloyd, 1961). The enzyme, a sulphohydrolase (Lloyd, Lloyd & Owen, 1962), also showed activity towards synthetic substrates: unresolved L-fucose mono-, di- and tri-sulphates suffered partial de-esterification. Analysis of the products of these enzymic hydrolyses suggested that the sulphatase might catalyse the hydrolysis of a sulphate ester group located at one position only of the fucose molecule. To enable further studies to be made the three isomeric monosulphate esters of L-fucopyranose have been synthesized.

Direct sulphation of L-fucose with pyridine-sulphur trioxide (Baumgarten, 1926; Duff, 1960) gave a mixture of mono-, di- and tri-sulphates. The monoesters were separated from the polyesters by column chromatography on DEAE-cellulose with 1M-ammonia as eluent; this method is of general application and monosulphates of L-rhamnose, D-glucose and D-galactose have also been isolated in this way (Lloyd, Stuart & Fielder, 1968). Separation of the isomeric fucose monosulphates was effected chromatographically by using a DEAE-cellulose column with 0.1M-borate buffer, pH 10, as eluent. The fractions were desalted on columns containing Sephadex G-10. The separated L-fucose 2-, 3- and 4-sulphates (barium or sodium salts) were identified by electrophoretic, periodate oxidation and other studies.

L-Fucose 2-sulphate was also synthesized definitively by successive sulphation and de-O-acetylation of 1,3,4-tri-O-acetyl-L-fucopyranose, but yields were low. A more effective synthetic

route to the 2-sulphate furnished, in the penultimate stage, methyl- α -L-fucopyranoside 2-sulphate, which underwent hydrolysis in dilute acetic acid to give methyl- α -L-fucopyranoside and L-fucose 2-sulphate. The extreme sensitivity to acids of 2-sulphate esters of glycopyranosides has been shown to extend to other sugars (Lloyd & Forrester, 1971).

The sulphohydrolase from *Patella vulgata* de-esterified the purified L-fucose 2-, 3- and 4-sulphates at closely similar rates.

We are grateful to the Science Research Council for the award of a Research Studentship to P. F. F.

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Localization of Monomethyl- and Dimethyl-tocols on Cytoplasmic Particles in Plant Tissues

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Preliminary studies on the intracellular distribution of the tocopherols showed α -tocopherol to occur in the chloroplast, whereas β -, γ - and δ -tocopherols were found in the extrachloroplastidic part of the cell (Newton & Pennock, 1971). It was further shown that in *Fucus spiralis* the β - and γ -tocopherols appeared in a fraction that sedimented after chloroplasts and part of the δ -tocopherol could be precipitated by further centrifugation. This paper reports further studies on the localization of non- α -tocopherol in *F. spiralis*, *Coleus hybridus*, *Phaseolus vulgaris* and *Rumex sanguineus*.

After removal of chloroplasts by low-speed centrifugation of homogenates of the plants mentioned above, γ -tocopherol was found in a fraction sedimenting at 25 000g for 45 min. This heterogeneous fraction contains some fragments of nuclei, chloroplasts and cell wall (cell walls are mostly removed from the homogenate by passage through muslin) as well as mitochondria and some cytoplasmic organelles such as Golgi bodies, lysosomes, spherosomes, lomasomes and microtubules (Clowes & Juniper, 1968). Little or no γ -tocopherol was found in preparations of nuclei, mitochondria, cell walls or chloroplasts.

In earlier work δ -tocopherol was not found in