Endogenous Biosynthetic Precursors of (+)-Abscisic Acid. V. Inhibition by Tungstate and its Removal by Cinchonine shows that Xanthoxal is Oxidised by a Molybdo-Aldehyde Oxidase

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Abstract

A cell-free preparation from avocado fruit incorporates [^{14}C]mevalonate into ABA. A number of specific inhibitors have been used to probe the system and tungstate ions at 100 µM reduce the ^{14}C in ABA by 80% The inhibitory effect was overcome by the alkaloid cinchonine (2000 µM) which binds tungstate strongly and selectively.

More ^{14}C from mevalonate was present in xanthoxal (4600 dpm), less in ABA (340 dpm) when the cell-free system was inhibited by tungstate (100 µM) than in controls (1810 dpm in xanthoxal, 1200 dpm in ABA), which shows that xanthoxal is the substrate for the aldehyde oxidase. Xanthoxic acid, therefore, is the next intermediate and AB-aldehyde is not a normal precursor.

The potential for using the tungstate/cinchonine reaction to probe other biosynthetic pathways which require a molybdate ion is discussed.

Keywords: Abscisic acid, aldehyde oxidase, avocado, biosynthesis, cell-free system, cinchonine, molybdenum, tungstate, xanthoxal, xanthoxic acid.

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