The Occurrence and Metabolism of the 1',4'-Diols of Abscisic Acid

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Abstract

The 1',4'-cis- and the 1',4'-trans-diols of abscisic acid (ABA) were produced when R,S-[2-^{14}C]ABA was supplied to avocado fruit and broad bean shoots. The trans-diol was also a metabolite of R,S-ABA in peas but not in tomatoes. The diols were derived from both R- and S-ABA with the R- enantiomer predominating. The 1',4'-cis- and 1',4'-*trans*-diol were found to be endogenous constituents of avocado (14.5 ng/g and 93 ng/g respectively) and the *trans*-diol was found in pea shoots (5.2 ng/g). At low concentrations, exogenous 1',4'-cis- and 1',4'-*trans*-diols were metabolised by tomatoes, mainly to dihydrophaseic acid-4'-O-β-D-glucopyranoside. As the concentrations of the diols supplied to tomato shoots increased, a greater proportion was conjugated to form their 4'-glucosides and glucose esters.

When the 1',4'-[2-^{14}C, 4'-^{2}H]*trans*-diol of ABA was supplied to tomato shoots the deuterium atom was lost from the 4'- position during conversion into the 4'-glucoside of DPA. This suggests that the *trans*-diol is converted into DPA via enzymic oxidation to ABA.

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