Glucosyltransferase activity of Arabidopsis UGT71C1 towards lignans

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Lignans are a class of phenylpropanoids widely distributed in the plant kingdom. Some lignans are known to be present as glycosides. In Arabidopsis, pinoresinol glucoside and lariciresinol glucoside(s) are found to be accumulated in the roots, but the enzymes involved in the glucosylation remain to be characterized. UGT71C1 showed activity towards several phenylpropanoids in previous studies, although its activity towards lignans has not been investigated. In the present study, the involvement of UGT71C1 in lignan glucosylation was examined. Quantification of lignans in a T-DNA knockout line of the *UGT71C1* gene, *ugt71c1*, by an ultra performance liquid chromatography-tandem mass spectrometry showed that the content of pinoresinol glucoside decreased in parallel with an increase of pinoresinol at the corresponding degree. Two major peaks corresponding to lariciresinol glucosides were detected in the mass chromatogram of the extract from the wild type and one of the peaks decreased in the *ugt71c1* line suggesting that the amount of lariciresinol glucoside also decreased in the mutant. UGT71C1 expressed in *Escherichia coli* showed glucosyltransferase activity towards pinoresinol and lariciresinol. The present results suggest that UGT71C1 is involved in lignan glucosylation in Arabidopsis.