

Potential Use of D-Xylose for Coffee Plant Transformation

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SUMMARY

An alternative approach involving xylose isomerase gene (*xylA*) as a positive selection marker system is being developed for coffee plant transformation. We report here that High Frequency Somatic Embryogenic calli derived from leaf tissue belonging to four different species of *Coffea* namely *C. arabica*, *C. canephora*, *C. heterocalyx* and *C. moloundou* cannot use D-xylose- a complex sugar as the sole carbon source ranging from 2 g/l to 32 g/l tried. Study conducted on mannose shown that it cannot be used as selective agent since coffee HFSE calli were able to use mannose as carbon source. The presence of xylose could not allow HFSE calli growth in all the four species of *Coffea*. Histological analysis by localizing protein, lipid and starch discriminated normal metabolically active positive control HFSE calli from xylose treated. However, plant cells were known to use the keto-isomer of xylose, D-xylulose (single chain molecule) as a carbon source. The significance of the present findings would enable to exploit the use of the gene encoding D-xylose ketol-isomerase, EC 5.3.1.5 as selectable marker gene that would interconvert D-xylose to D-xylulose. Xylose based positive selection would give us a biosafe method and eliminate undesired antibiotic or herbicide selection in production of transgenic plants of coffee.