Whole seeds of Bauhinia variegata L. (Fabaceae) as an efficient biocatalyst for benzyl alcohol preparations from benzaldehydes

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Resumen

Whole seeds of Bauhinia variegata L. (Fabaceae) were utilized as a biological reducer to transform benzaldehyde into benzyl alcohol. The effects of some variables such as temperature, the load of substrate and co-solvent, were established to optimize the reductive process. Utilizing the optimal reaction conditions, a laboratory-scale reaction (final concentration of the substrate: 21.2 mM) was performed to obtain benzyl alcohol (conversion: 95%; isolated yield: 49%; productivity: 1.11 g L−1 or 0.046 g L−1h−1 of benzyl alcohol). In addition, using these optimal conditions,

fourteen substituted benzaldehydes were reduced, with a conversion achieved to their corresponding benzyl alcohols ranging from 62% to >99% (isolated yields from 7% to 70%). Moreover, useful building blocks by the synthesis of the drugs and important commercial products were also obtained. The scope, limitations and advantages of this new biocatalytic synthetic method are also discussed.

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