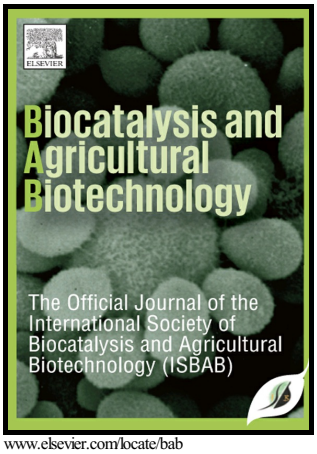

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Baliospermum montanum hydroxynitrile lyase catalyzed synthesis of chiral cyanohydrins in a biphasic solvent

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Abstract

This study presents asymmetric synthesis of cyanohydrins in aqueous–organic biphasic system using crude *Baliospermum montanum* hydroxynitrile lyase (*Bm*HNL). The effect of various biocatalytic parameters e.g. different organic solvents, ratio of organic solvents, substrate concentration (benzaldehyde and HCN), pH, and temperature were studied to achieve highest % conversion and enantiomeric excess of (*S*)-mandelonitrile. Among the organic solvents i.e. hexane, toluene, acetonitrile, *tert*-butyl methyl ether (TBME), *di*-isopropyl ether (DIPE) and *n*-butyl acetate studied, 10% *n*-butyl acetate showed best results. Optimal results were also found with 0.8 mM benzaldehyde, 10 min reaction time, pH 4.2 and substrate to KCN ratio of 1:125. Under optimal biocatalytic conditions more than a dozen of different aromatic aldehydes were converted into corresponding chiral (*S*)-cyanohydrins. This method also reports the synthesis of eight chiral (*S*)-cyanohydrins for the first time, not synthesized by any (*S*)-selective HNL earlier.

Graphical **Abstract**