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Biocatalytic production of (*S*)-2-aminobutanamide by a novel D-aminopeptidase from *Brucella* sp. with high activity and enantioselectivity

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Highlights

- A novel D-aminopeptidase from *Brucella* sp. was biochemically characterized.
- The enzyme exhibited ideal catalytic properties with 2-aminobubtanamide as substrate.
- The enzyme showed optimum temperature at 45 ℃ with high thermostability at 30 ℃.
- Kinetic resolution of 300 g/L substrate was achieved by 4 g/L (WCW) recombinant cell.
- The conversion reached 50% with >99% *e.e.* and no by-products were detected.

Abstract

As the important chiral building block of levetiracetam, the synthesis of (*S*)-2-aminobutanamide has attracted a great deal of attention. The D-aminopeptidase catalyzed kinetic resolution of 2-aminobutanamide was demonstrated as an effective strategy for (*S*)-2-aminobutanamide production. In this study, a novel D-aminopeptidase from *Brucella* sp. (*Bs*-Dap) was screened and systematically characterized. The enzyme exhibited maximum activity at 45 °C, pH 8.0 and it showed relatively low K_m value toward 2-aminobutanamide, indicating its high affinity to the substrate. Kinetic resolution of 300 g/L 2-aminobutanamide by recombinant *Escherichia coli* whole cells (4 g/L wet cell weight) resulted in 50%