

RECOMBINANT ECTOINE FROM DEEP SEA BACTERIA

BRIEF DESCRIPTION:

Recombinant Ectoine: A major compatible solute from halophilic bacteria, *Bacillus clausii*: Ectoine and 5-hydroxyectoine belong to the family of compatible solutes which are known to stabilize the cell's essential functions by maintaining the stability of proteins under stress conditions like high salinity, heat or aridity stress, UV irradiation and dryness. Compatible solutes are usually synthesized under elevated saline conditions and then accumulate in the cell. The present invention relates to a method for producing recombinant ectoine or a derivative thereof, using the recombinant plasmid containing genetic material coding for biosynthesis of ectoine. Products developed in this invention represent a new supplement in derma pharmacy industry.

PRODUCT DESCRIPTION:

A recombinant *E. coli* M15 bearing the ectoine biosynthesis genes from deep sea *Bacillus clausii* and optimized methodology for production and purification of recombinant ectoine in laboratory conditions.

PROCESS:

The present invention reports the construction and optimization of ectoine biosynthesis gene in *Bacillus clausii* as well as the construction of plasmids for expression of intracellular ectoine in *Escherichia coli* M15 (expression host), and subsequent mass production by submerged fermentation.

- The biosynthesis genes derived from the genome of *Bacillus clausii* is a novel strain of *Bacillus clausii* NIOT-DSB04 isolated from the deep-sea sediment collected from, Andaman Sea.
- The ectoine biosynthesis genes (EctA,B&C) coding for enzymes DABA acetyltransferase, DABA-2- oxoglutarate transaminase and ectoine synthase was amplified by PCR.
- The ectoine biosynthesis genes were cloned in pTZ57R/T.
- Expressed in *Escherichia coli* M15 expression host using in pQE30 vector.
- The heterologous expression of ectoine was optimized using IPTG.
- A maximum ectoine production of 6.7 mg/L was achieved at concentration for 1 mM IPTG.

Scale of Development: Technology demonstrated and commercialized.

