

# A trans-dihydrocarvone-producing bacterial strain *Klebsiella* sp. O852 with potential use in bio-flavor production

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## Abstract

Celery spices are an important raw material in the production of food and cosmetic, including carveol, carvone and dihydrocarvone. In this study, a new *Klebsiella* sp. O852 was isolated, which was capable of converting limonene to trans-dihydrocarvone. The yields of trans-dihydrocarvone reached up to 1058 mg/L when the strain O852 was incubated using LB-M medium for 4 h at 36°C and 150 rpm and the process was monitored for 36 h after adding 1680 mg/L limonene dissolved in ethanol. Limonene was used as a 20% (v/v) solution in the ethanol. Besides, the genome of *Klebsiella* sp. O852 comprised 20 contigs and 19 scaffolds. The genome size was 5.49 Mb. A total of 5218 protein-encoding genes were predicted, these genes mainly distributed in some metabolism and biosynthesis categories. Finally, several genes involved in trans-dihydrocarvone biosynthesis were further analyzed, identified and verified by quantitative real-time polymerase chain reaction (RT-qPCR) and exogenous expression. These novel genes may find value in the bioconversion of inexpensive raw materials to natural flavors and fragrances.

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