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Characterization of a novel bacterium *Massilia* sp. EP15224 producing violacein from forest soils of Korea

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Violacein has received much attention due to its various important biological activities, including broad-spectrum antibacterial and antifungal activity, anti-malarial, anti-tumor, anti-oxidant, and anti-diarrheal activities. EP15224 strain isolated from forest soils of Korea, and was found to be a new species belonged to the genus *Massilia* based on its 16S ribosomal DNA sequences. The 16S ribosomal DNA of strain EP15224 displayed 97% homology with *Massilia* sp. BS-1, the bacterium of the first report on the production of violacein by a *Massilia* species and the nearest violacein-producing bacterium. Strain EP15224 produced bluish-purple pigment well in a synthetic MM2 medium (glucose, $(\text{NH}_4)_2\text{SO}_4$, Na_2HPO_4 , $7\text{H}_2\text{O}$, KH_2PO_4 , MgSO_4 , $7\text{H}_2\text{O}$) containing 1mM L-tryptophan. The chemical analysis of the pigment by LC/MS/MS showed that it is violacein (MW 343.34). In shake flask experiments, the optimal culture conditions for violacein production are as follows: Glucose 2g/L, $(\text{NH}_4)_2\text{SO}_4$ 1g/L, Na_2HPO_4 , $7\text{H}_2\text{O}$ 2g/L, KH_2PO_4 1g/L, MgSO_4 , $7\text{H}_2\text{O}$ 0.1g/L, L-tryptophan 0.24g/L, 25mL medium in a 250mL flask, with an inoculum size of 10% (v/v). 300mg/L crude violacein was achieved using the optimized conditions after 72h of cultivation with 250 rpm at 25°C. The productivity of violacein by *Massilia* sp. EP15224 was sevenfold higher than it of *Massilia* sp. BS-1.

Biography

Sang-Hong Yoon is the head, Laboratory of metabolomics, National Academy of Agricultural Science, completed his Ph D. degree in food chemistry and biotechnology at the Yeungnam University in 1993. He has published more than 15 papers in international journals, and is the author of 27 patents. His present scientific interests are followings: exploitation of functional oligotrophic bacteria, industrial enzyme development from metagenomic resources, "environmental omics" analysis on bioremediation in the soil environments over-polluted with organophosphorus pesticides.

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