抗菌性紫色素生産のための低温菌の分離と生化学的検討に基づく工業化の研究

1999 Fiscal Year Final Research Report Summary

Study on Isolation and Biochemical Examination of Psychrotrophic Bacterium for Large Scale Production of Antimicrobial Violet Pigment

Research Project

Project/Area Number

10650780

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

生物・生体工学

Research Institution

Kanazawa University

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Project Period (FY)

1998 – 1999

Keywords

violet pigment / psychrotrophic bacterium / antimicrobial activity / putrefactive bacterium / natural pigment

Research Abstract

About 20 % of all foodstuffs produced in the world are wasted because of septic action by microorganisms and many people have experienced bad health effects due to the ingestion of septic food. Since many microorganisms have been reported as putrefactive and pathogenic bacteria, which cause the septic action of food, the prevention of bacteria contamination in food storage is one of the most important factors for supplying safe and healthy food to the consumer. The authors have screened a psychrotrophic bacterium, RT102 strain, which synthesized an antimicrobial violet pigment, from the intestine of a rainbow trout and found out that the violet pigment shows an antimicrobial action for some species of microorganisms. The chemical structure and antimicrobial activity of violet pigment produced by the psychrotrophic

bacterium isolated from the intestine of a rainbow trout were investigated experimentally. The psychrotrophic bacterium was found to be a new species belonging to the genus Janthinobacterium lividum. ィイD11ィエD1H, ィイD113ィエD1C-NMR, and FT-MS spectra analyses results showed that the chemical structure of violet pigment was a mixture of vioracein and deoxyvioracein. The antimicrobial activity of violet pigment was confirmed for putrefactive bacteria such as Bacillus subtilis, Bacillus megaterium, Staphylococcus aureus, and Pseudomonas aeruginosa. The growth inhibitory and lethal effects of violet pigment on the putrefactive bacteria were evaluated by increasing the concentration of violet pigment, ranging from 5 to 20 mg/1. It was found that higher concentrations of violet pigment caused not only growth inhibition but also the death of the putrefactive bacteria.

Research Products (8 results)

All | Other

All | Publications

[Publications] Y. Nakamura, M. G. Sungusia, T. Sawada, M. Kuhawara: "Lignin-Degrading Enzyme Production by Bjekandera adusta Immobilized on Polyurethane Foam"Journal of Bioscience and Bioengineering. 88・1. 35-41 (1999)

[Publications] Y. Nakamura, T. Sawada, K. Yamaguchi: "Breeding and Cultivation of Glucoamylase-Producing Yeast with Inactivation of MAT Locus"Journal of Chemical Engineering of Japan. 32・4. 424-430 (1999)

[Publications] 中村嘉利、沢田達郎、小森正樹: "固定化菌による重金属イオン存在下のフェノールの微生物分解"環境化学. 9・3. 581-587 (1999)

[Publications] Y. Nakamura, T. Sawada: "Biodegradation of Phenol in the Presence of Heavy Metals"Journal of Chemical Technology and Biotechnology. 75・2. 137-142 (2000)

[Publications] Y. Nakamura: "Lignin-Degrading Enzyme Production by Bjerkandera adusta Immobilized on Polyuretane Foam"Journal of Bioscience and Bioengineering. 88-1. 35-41 (1999)

[Publications] Y. Nakamura: "Breeding and Cultivation of Glucoamylase-Producing Yeast with Inactivation of MAT Locus"Journal of Chemical Engineering of Japan.. 32-4. 424-430 (1999)

[Publications] Y. Nakamura: "Microbial Degradation of Phenol in the Presence of Heavy Metal Ion by Immobilized Bacterial Cells"Journal of Enviromental Chemistry. 9-3. 581-587 (1999)

[Publications] Y. Nakamura: "Biodegradation of Phenol in the presence of Heavy Metals"Journal of Chemical Technology and Biotechnology. 75-2. 137-142 (2000)

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