Enhancement of Antibacterial Activity by Starch Under Oligotrophic Culture Condition for an Actinomycetes Strain Isolated from Schoolyard Soil

Fujioka, Aya
Takeuchi, Rina
Nara, Megumi

Within the 45 actinomycetes strains isolated from schoolyard soil using agar plate culture, 21 strains showed some antibiotic activity for bacteria (Kokuria rhizophila, Bacillus subtilis) and/or a fungi(Saccharomyces cerevisiae). Nine strains having strong antibiotic activity were then cultured in a liquid medium, and a strain, "Su-40", indicating strong antibacterial activity was finally selected. By analyzing the gene structure of 16SrRNA of the strain, it was identified as Streptomyces cacaoi by a private institute, and the strain was further identified as S. cacaoi subsp. asoensis by the neighbor-joining method using the phylogenetic analyses program by a public research. The strain was confirmed to have similar morphology with the type strain as well as positive antibacterial activity for the 2 test bacteria mentioned above, but no positive activity for the fungus. The antibacterial activity of the isolated strain was highly dependent on the differences in carbon source, and high activity was always detected with starch. Maximal fungal standing stock during culture was only 1/12.5 in the medium containing starch as the carbon source compared with the normal medium. However, the antibacterial activity was up to 2.5 times higher for the starch medium than the normal medium. The specific antibacterial activity normalized to the standing stock was about 30 times higher for the starch medium compared to the normal medium.

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