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Isolation of Marine Microorganisms from Deep Sea of Suruga Bay

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Summary

The purpose of the present study is to isolate the marine microorganism from the deep water of Suruga Bay, to make the culture collection, and to isolate a new, useful material. The use of Suruga Bay deep water is a project being promoted by Shizuoka Prefecture, getting water regularly from Suruga bay in the Yaizu City offing. Because the human activity do not influence the deep water, the possibility that a greatly diverse microorganism lives is thought. Various microorganisms should be obtained by getting water from two layers (397 meters and 687 meters in depth). We aim to isolate the marine microorganism from this deep water in order to utilize it for the fermentation industry.

The 50 strains of microorganisms were isolated from Suruga Bay deep water. Each strain was cultured with the nutrient agar again, and the sample for the extraction was made. Each strain of each medium was extracted by using the acetone. It dissolved to dimethyl-sulfoxide, after the acetone was evaporated, and it was subjected to the antibacterial examination. The anti-bacterium examination against three kinds of bacteria including *Escherichia coli*, *Staphylococcus aureus*, and *Bacillus subtilis* was accomplished. As a result, the extracted material of the fungi named 687-5 showed remarkable anti-bacterium against *Bacillus subtilis*. The separation was performed by the reversed phase open chromatography with Mitsubishi Chemical hydrophobic resin CHP20P. The anti-bacterial activity was seen in 100% MeOH fraction. Then, the isolation of the active compound was accomplished by using HPLC from the 100% MeOH fraction. The anti-bacterial activity was observed in the peak at the retention time of 25.92 minutes. To elucidate the chemical structure, ESI-MS was measured. The ion peak was observed in m/z 303.23 in the positive ion mode and m/z 279.21 in the negative ion mode.

In order to analyze details of the structure, the compound was subjected to the analysis using nuclear magnetic resonance device JEOL ECA600. The sample dissolved to chloroform-d for NMR experments. As a result of 1H-NMR, a methyl proton, many methylene protons, and the olefine protons were observed. Moreover, to analyze details or more and the structure, two dimensional NMR were measured. The existence of the carbonyl carbon was clarified as a result of COSY, HMBC, and the HMQC methods. The compound was identified as a linoleic acid.