## PA-59

Sulfur-oxidizing acitivity found in fungus strain isolated from deteriorated stone surface in Angkor site, Cambodia

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Key word: sulfur-oxidizing microorganisms, fungus, deterioration, Angkor site.

[Introduction]Since 1998, we have been examining sulfur-oxidizing and heterotrophic microorganisms on the surface of deteriorated stones in Angkor site. Our results showed that sulfur-oxidizing microorganisms inhabiting at high density on the surface of the stone materials. During enumeration of sulfur-oxidizing microorganisms based on MPN, we found the growth of fungi in sulfur containing culture. Here, we focused on the isolation of fungus strain, THIF01, about its acid production in autotrophic condition and the effects when inoculated to sandstone surface.

[Methods]Strain THIF01 was incubated in basal-salt medium with elemental sulfur. Concentration of sulfur compounds was measured by ion chromatography during incubation. DAPI and aniline blue staining was performed to observe the growth condition of fungi in liquid culture and on stone surface.

[Results and Discussions]When the strain THIF01 was inoculated in a basal-salt medium with elemental sulfur, the pH decreased from 5.0 to 4.0 in 60 days. Small amounts of sulfate and thiosulfate were produced during incubation. Germination of spores and growth of hyphae were clearly observed in the sulfur containing medium that were confirmed by DAPI. We are now trying to grow the strain THIF01 on the sandstone to know the effect of fungus growth on the stone.

We found that both fungi and bacteria are important on the deterioration of sandstone because of the excretion of acidic materials.

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Effect of addition of trace amount of gellan on growth of soil bacteria.

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Key words: gellan, rhizosphere soil, couture condition

It has been well recognized that addition of polymers affects on growth of microorganisms in several environments. However, only a few polymers use to culture of bacteria. Previously, we observed higher diversity in bacterial community from rhizosphere soil cultured in medium containing gellan, which increases dispersion of particles in the liquid media. In this research, we analyzed effect of addition of trace amount of gellan on growth of several commonplace bacteria.

Bacillus subtilis, Arthrobacter globiformis, Escherichia coli BL21, E. coli XL1-Blue, E. coli JW1908 (deficient in flagellin) and strain ALr2s (isolated in our previous research) were cultured at 25oC by using 1/10 TYE medium. Effect of gellan addition on growth was examined in several concentrations (0-0.04 %(w/v)).

Growth of motile bacteria was commonly inhibited depending on the increase of gellan concentration, while their growth was slowly due to probably suboptimum culture condition. Growth of non-motile bacteria was improved or not affected by addition of gellan. It is suggested that addition of trace amount of gellan in the medium are adverse on nutrient uptake for motile bacteria, which is immobilized by gellan. Addition of gellan could make an advantage for non-motile bacteria, and cause an increase of diversity in culturable microbial community.

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