## B314 Monitoring of the survival and specific detection of 4-chlorobiphenyl (4CB) degrading bacteria in the soil microcosms

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We purposed the monitoring of the degradation of 4-chlorobiphenyl(4CB) in the soil microcosms and the detection of the sequences for the *pcb*C gene encoding 2,3-dihydroxybiphenyl dioxygenase for 4CB degradation, in soil microcosms. Those microcosms included with or without the cultivation of $10^6$ CFU/g · soil *Pseudomonas sp.* DJ-12, microorganism degrading 4CB, and with or without the addition of 4CB and was composed of the no historically 4CB-contaminated soil or the long-time contaminated soil environments. We used the direct total soil DNA extraction method and PCR amplification and the detection with specific gene probes. At first, the degradation of 4CB(500ppm) was identified by gas chromatography in the soil inoculated with *P. sp.* DJ-12 for 9 days, and it was coincided with the result of PCR amplification of *pcb*C gene. And we extracted the total DNA in soil microcosms for 9 days, and the total DNA was further purified by Seaplaque GTG agarose, and we recovered the polymorphic DNA(20~25kb). And we amplified the pcbC gene with PCR amplification. And we concluded the detection limits of soil DNA extraction method to $10^3$ CFU/g · soil of *P. sp.* DJ-12 in the sterilized soil.

## B315 DETOXIFICATION MECHANISM for CADMIUM in *Azomonas agilis* PY101

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Microorganisms are known to employ a large variety of mechanisms for adaptation to the presence of cadmium. A cadmium-resistant strain isolated from Anyang stream, *Azomonas agilis* PY101 exhibited strong resistance to 1000ppm of $Cd^{2+}$. *A. agilis* PY101 produced a green-fluorescent pigment induced by cadmium. In the analytical result of FT-IR, this pigment contained a amount of sulfur atom. In the results of FPLC gel filteration and atomic absorption spectrophotometry, This revealed that the green-fluorescent pigment of *A. agilis* PY101 possess a high-affinity cadmium binding property. As a result, this pigment may act as an impermeable barrier for toxic cadmium. The dramatic decrease(approximately 400ppm) of concentration of $cd^{2+}$ in the culture medium during the growth phase of *A. agilis* PY101 was confirmed by the inductively coupled plasma-atomic emission spectrophotometer. Transmission electron microscopic analysis revealed that *A. agilis* PY101 actively accumulated $Cd^{2+}$ in the cytoplasm. In the results of IC, we was found to the remarkably decrease of concentration of $SO4^{-2}$ in the cell cultured with cadmium. We suggested that the detoxification mechanism of *A. agilis* PY101 involved the formation of cadmium-binding pigment and cadmium sulfide. The presence of large numbers of electron-dense granules in the cytoplasm provided additonal support for this conclusion.