

**E321** Starvation supports cadmium tolerance in *Enterobacter cloacae*

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The *Enterobacter cloacae* IAM 1562, cadmium-sensitive strain, showed the elevated pattern of growth in third day and sixth day after carbon and phosphate starvation in M9 medium containing abundant phosphate sources and TMS medium containing much lower level of phosphate sources. The *Enterobacter cloacae* IAM 1624, inducible strain of cadmium resistance and harboring plasmid, also showed same pattern. *E. cloacae* IAM 1624 exhibited a little higher survival for relatively high concentration of cadmium at third and sixth day after carbon starvation in TMS medium than that of M9 medium. In contrast, IAM 1562 exhibited opposite results and more over adaptive mutant was isolated. In case of phosphate starvation in TMS medium, IAM 1624 showed a higher survival for relatively high concentration of cadmium than IAM 1562. *E. cloacae* KHY4, mutant strain of cadmium resistance, exhibited relatively higher survival at the concentration of 0.75 mM cadmium than native strain and much higher concentration of MICs of cadmium.

**E322** Isolation and identification of the heavy metal resistant microorganism near Kahak zinc mine in Kwangmyong city.

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Three bacterial strains of eighteen samples were isolated from Mokgam stream near Kahak mine in Kwangmyong city and these were named to KH 6-5, KH6-10, KH2-1. After 24-36 hour-culture in LB, three bacterial strains were isolated. In biochemical test, KH6-5 and KH2-1 were identified as a *Pseudomonas* species(G<sup>-</sup>), and KH6-10 were identified as a *staphylococcus* species(G<sup>+</sup>). The isolates had resistance against many antibiotics including Kanamycin (Km), Streptomycin (Sm), Ampicillin (Amp), and Tetracyclin (Tc). However the isolates showed Chloramphenicol(Cm) sensitivity. MICs were determined by viability on LB solid plate for 24-48 hrs, isolates also were exhibited resistance against heavy metal. interestingly KH6-5, KH6-10, KH2-1 were tolerance against Cadmium (Cd), Cobalt(Co), Arsenite(As), Nickel(Ni), Lead(Pb), and Zinc(Zn) especially these were remarkable that isolates showed higher cadmium resistance(4mM). Isolates have been shown to possess plasmids.