B017

Selection of Plant Growth-promoting Bacteria from the Root of Sand Dune Plants in Tae-An Area.

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A total of 356 bacterial strains were isolated from the root of the 10 sand dune plant species, and their plant growth-promoting activity was examined. Firstly, the *in vitro* antagonistic activity was examined by the formation of inhibition zones against 4 plant pathogenic fungi, namely *Rhizoctonia solani, Pythium ultimum, Fusarium oxysporum* and *Botrytis cinerea*. The strains were also screened for *in vitro* production of degradative enzymes, siderophores, and the plant growth hormone indole-1.3 acetic acid (IAA). One hundred twenty isolates showed antagonistic activity against fungal pathogens, among which a high proportion of isolates were assigned to *Pseudomonas* spp. and *Chryseobacterium* spp. A number of strains showed protease and chitinase activities, and secreted siderophores. High protease activity was found in *Pseudomonas* sp. and *Chryseobacterium* sp., chitinase in *Pseudomonas* sp. and siderophore in *Pantoea* sp., respectively. IAA production was mainly observed in *Pseudomonas* sp., and pectinase in *Pseudomonas* sp. and *Acinetobacter* sp. Members of *Pseudomonas* were found to have high potential as the growth promoting agent of sand dune plants.

B018

Isolation and Characterization of Rhizobia Associated with Plants Growing in Coastal Sand Dune Area

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The genus *Rhizobium*, now including former soil-borne *Agrobacterium* species, is one of the most important soil bacteria interacting with plants. In the study of bacterial diversity associated with wild plants growing in coastal sand dune area, thirty one bacterial strains belonging to the genus *Rhizobium* were isolated from the roots of seven sand dune plant species growing in the sand dunes of Taean area. Based on the analysis of 16S rDNA, the isolates were assigned to about ten species including *R. radiobacter* (former *Agrobacterium tumefaciens*), *R. larrymoorei* (former *A. larrymoorei*), *R. leguminosarum*, *R. rhizogenes* and *Rhizobium sullae*. Strains identified as *R. radiobacter*, comprising 41.9 % of the total isolates, were found in nearly all plant species. It is not clear whether they play a beneficial or detrimental role in the plant growth. Differences were observed between the rhizobia species and host plant species, thereby indicating host-specific association of rhizobia. Some isolates shared low levels of 16S rDNA similarity, and thus were potential candidates of novel species.

B019

Comparative Studies on Membrane Filtration Method for the Detection of *E. coli* as Fecal Indicator

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For precise monitoring of fecal pollution in surface water it was investigated the differences between total coliforms(TC) and fecal coliforms(FC) under membrane filtration method. The samples were collected from Gum, Youngsan, Nakdong, Geumho River and effluent from domestic wastewater treatment plant in Daegu. The presumptive TC/FC were enumerated after culturing on m-Endo Agar and m-Endo Agar LES at 35℃ for TC, and m-Endo Agar LES, m-FC Agar at 44.5℃ for FC. The No. of presumptive TC(1600CFU/100㎖) was higher than those of FC(30CFU/100㎖) both on m-Endo Agar LES. Besides, it was hard to detect TC because of overgrowth by background colonies. And then the presumptive TC/FC were purecultured and identified using IMViC test and API 20E. Among the 167 strains of TC on m-Endo Agar LES, *E. coli* accounted only for 7.2% whereas *E. coli* for 96.1% under 128 strains of FC on m-FC Agar. Moreover, the numbers of presumptive FC on m-FC Agar (65CFU/100㎖) were higher than those on m-Endo Agar LES(30CFU/100㎖). In conclusion, it suggests that the detection of FC using m-FC Agar rather than TC using m-Endo Agar might be reasonable for monitoring of fecal pollution. [Supported by grant from MOE]

B020

Arsenite Oxidation by Chemolithoautotrophic Consortium Obtained from Mine Tailings

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Arsenic is a known carcinogen in environments, occurring primarily as arsenate [As(V)] or as arsenite [As(III)], with the latter oxyanion having greater toxicity and hydrologic mobility than the former. We attempted to enrich chemolithoautotrophic arsenite-oxidizing microorganisms from samples collected at several mine areas in Korea. For enrichments, a minimal enrichment medium was used containing arsenite (5 mM) and CO_2-bicarbonate as sole E and C-sources, respectively. The predominant species of arsenic were separated by ion exchange method using a strong anion-exchange resin, and the concentrations were determined with AAS. Among several cultures from 10 different sites, the culture that came from Sangdong area performed best oxidizing all the added As(III) within 6 h of incubation. Chemical oxidation of As(III) to As(V) also occurred but it was only marginal. Addition of YE (0.005%) stimulated the growth of the consortium and the oxidation rate almost doubled. The pH of the medium decreased from pH 8 to around pH 5 since As(III) was oxidized to As(V) which is acidic in nature. The enriched culture might be useful for the detoxification of arsenic-contaminated environments.