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### The Diversity of Culturable Bacteria Isolated from Cooling-water System

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We isolated and cultured bacteria inhabiting cooling-water system in Kwangyang, Jeonnam Province, Korea. All of the isolated 68 strains were found to be differently colony morphologies. Average number of cooling-water bacteria ranged from  $1.64 \times 10^5$  (April) to  $2.05 \times 10^5$  CFUs/ml (May). Bacterial diversity among the isolated strains was evaluated analyses of PCR-amplified 16S rDNAs (ARDRA), followed by phylogenetic analysis of the partial 16S rDNA sequences. The combination of restriction enzyme digestions with *Hae* III generated 44 distinct patterns. A neighbor-joining tree of the partial 16S rDNA sequences resulted in the division of the 68 strains into 4 phyla, *Firmicutes* (41.2%), *Proteobacteria* (38.2%), *Actinobacteria* (16.2%) and *Bacteroidetes* (4.4%), 18 different families and 22 different genera. This study are providing interesting insights on cooling-water bacterial community that will be useful for further investigation related to reducing the number of bacteria in order to prevent the growth of oxygen producing plants from inhibiting of bacteria and the formation of biofilm. Additionally, five novel species candidates were found, based on similarities of the 16S rDNA sequences to those of previously published species.

**Key words:** Culturable bacteria,ARDRA, 16S rDNA

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### Isolation and Identification of Surfactin-Producing *Bacillus* sp. CS40 from Soybean Sauce

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A bacteria strain producing surfactin was isolated from Korean soybean sauce, identified as member of the genus *Bacillus* by 16S rDNA sequencing, phenotypic, and chemotaxonomic analysis, and characterized. The organism was aerobic, Gram-positive, endospore-forming, rod-shaped bacterium. The main fatty acid was terminally branched saturated iso-C<sub>15:0</sub> (52.33%) and anteiso-C<sub>15:0</sub> (28.69%). The 16S rDNA sequence and phylogenetic analysis revealed that the isolate was most closely related to *Bacillus* sp. The strain, designated CS40 produced a surfactin and an antibiotics that inhibit the growth of *Aspergillus flavus*. Also, the species produced a wide variety of hydrolytic enzymes such as cellulase, protease, amylase, lipase and mannase.

**Key word:** Korean soybean sauce, surfactin, antibiotic, *Bacillus* sp.