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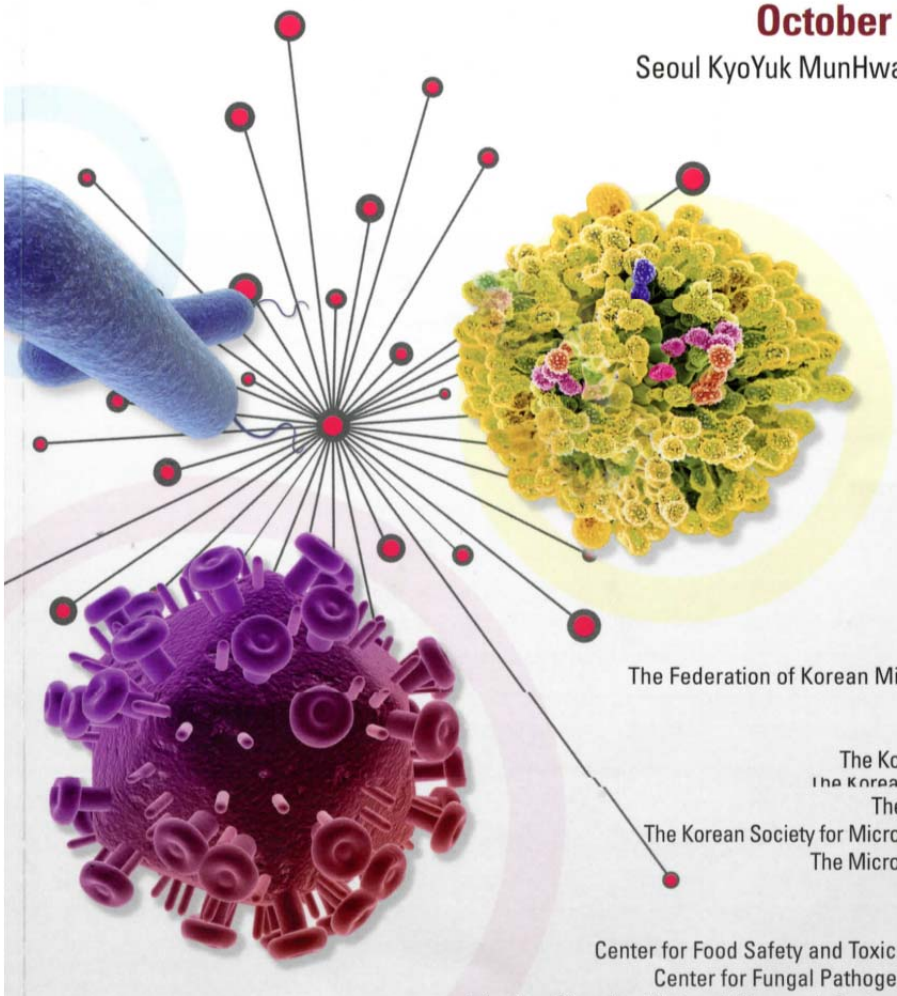

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Polar and Alpine Microbial Collection (PAMC): a Culture Collection Dedicated to Polar and Alpine Microorganisms

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Polar areas may have environments with low nutrient concentrations, low temperature, extreme variability in day length, and strong solar ultraviolet radiation exposure. Polar areas comprise distinct habitats such as sea ice, glacial ice, permafrost, tundra wetlands, oceanic water, and lakes (Reddy et al. 2009). Prokaryotes are dominant in polar areas and play crucial roles in biogeochemical cycles, food chains, and the mineralization of pollutants (Nichols et al. 1999). Microorganisms have developed diverse adaptation mechanisms that enable them to compensate for the deleterious effects of harsh environments (Gerday et al. 2000). Cold-active enzymes have high specific activities at low and moderate temperatures and are inactivated easily by a moderate increase in temperature. These properties can be extremely useful in a broad range of industrial, agricultural, and medical applications (Gerday et al. 2000). Exopolysaccharides from polar fungi and bacteria were suggested to function as a cryoprotectant in polar environments (Selbmann et al. 2002; Kim and Yim 2007). Thus, cold-adapted microorganisms have attracted the attention of the scientific community on account of their ability to produce cold-active enzymes and other materials.

Culture collections for polar microorganisms can provide research resources for ecological and physiological studies. The Polar and Alpine Microbial Collection (PAMC) is a specialized culture collection for maintenance and distribution of polar and alpine microorganisms. A database system was developed to share important data fields with DarwinCore2 and Ocean Biogeographic Information System database schemas. Approximately 1,500 out of 5,500 strains maintained in PAMC have been identified and belonged primarily to the phyla *Actinobacteria, Bacteroidetes, Firmicutes,* and *Proteobacteria*. Many of the microbial strains can grow at low temperature and produce proteases, lipases, and/or exopolysaccharides. PAMC provides search tools based on keywords such as taxonomy, geographical origin, habitat, and physiological characteristics. Biological materials and information provided by PAMC will be important resources for ecological and physiological studies on polar and alpine microorganisms.

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