

## 微生物保存機関巡り (23)

### Korean Agricultural Culture Collection (KACC): Maintaining Agriculture & Food Microorganisms in Korea

The Korean Agricultural Culture Collection (KACC) is a national microbial bank for utilization and application of indigenous microorganisms in Korea (Fig. 1). KACC was established within the National Academy of Agricultural Science in 1995, with the missions of (1) collection and conservation of agricultural and food microbial resources, (2) services on distribution, identification, preservation, training and consultation for microbial society, and (3) research on taxonomy and preservation of microorganisms.

KACC has collected a variety of microorganisms including bacteria, actinomycetes, yeasts, filamentous fungi and mushrooms with the help of Korean microbial researchers and foreign culture collections such as CBS, DSMZ and NBRC. KACC is holding 22,455 strains of microorganisms, and their information is open to the public through RDA Genebank's website ([http://www.genebank.go.kr/eng/microbe/gene\\_info.jsp](http://www.genebank.go.kr/eng/microbe/gene_info.jsp)). KACC provides more than 3,000 cultures every year to scientific communities home and abroad. KACC also conducts taxonomic and ecological studies on microorganisms to enhance the quality of microorganisms kept in KACC and better understand the microbial diversity in the environment. KACC is an authorized center organization for maintenance of microbial genetic resources by the Ministry of Agriculture, Food and Rural Affairs of Korea, and also a domestic patent depository designated by the Korean Intellectual Property Office. For the international cooperation, KACC partici-

pates in the World Federations for Culture Collection (WFCC) and Asian Consortium for the Conservation and Sustainable Use of Microbial Resources (ACM) activities. In 2009, KACC acquired ISO 9001 certificate for adhering to quality standards in handling procedures of microorganisms kept in KACC. On the basis of the ISO 9001 certification, KACC could provide high-quality microorganisms to the public.

#### Holding Microorganisms

As of 2013, KACC is keeping 22,455 strains representing 6,971 species including bacteria, actinomycetes, yeast, filamentous fungi and mushrooms. Most of the microbial strains were isolated from various environments such as plants, fermented foods, soils, and others in Korea. Some strains - mainly type strains, were obtained from foreign culture collections. In case of bacteria, KACC is holding 8,440 strains representing 4,198 species. Main genera of bacteria are *Bacillus*, *Lactobacillus*, *Pseudomonas*, and others. In case of fungi, 13,068 fungal strains representing 2,773 species are kept at KACC. Main genera of molds are *Aspergillus* and *Penicillium* for industry, and *Phytophthora*, *Colletotrichum*, and *Fusarium* for plant pathogens. KACC also maintains a lot of mushrooms from both wild and cultivated varieties. KACC had added 1,306 strains of microorganism in 2013 and the number of holding microorganisms is steeply increasing. KACC is one of the fastest growing culture collections in Asia. Additionally, KACC also holds more than 1,200 patent strains.

#### Preservation of Microorganisms

For the safe preservation of microorganisms, KACC adopts various preservation methods. For bacteria and sporulating fungi, KACC uses lyophilization and freezing in liquid nitrogen (LN<sub>2</sub>) tank and deep freezer. For non-sporulating fungi KACC use freezing in LN<sub>2</sub> tank and deep freezer and mineral



Fig. 1 Korean Agricultural Culture Collection (KACC) based at the National Agrobiodiversity Center in Suwon, South Korea

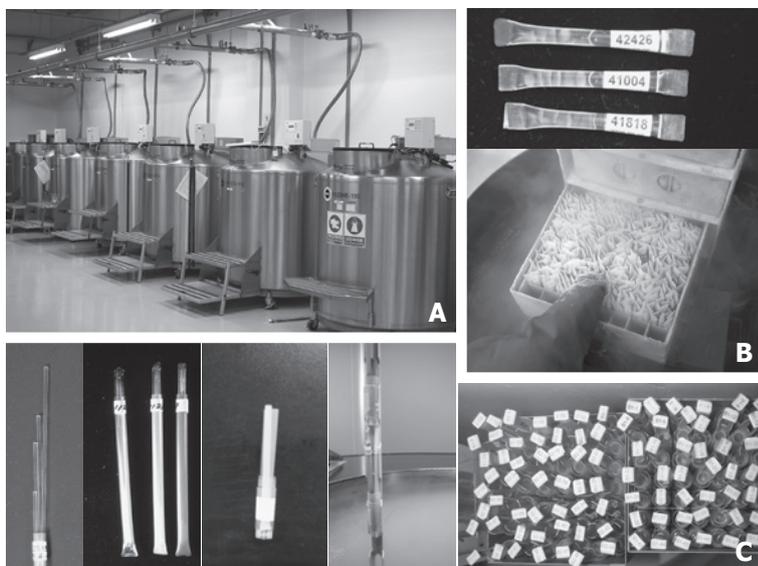


Fig. 2 Liquid nitrogen (LN<sub>2</sub>) storage in KACC. A. Liquid nitrogen tanks in KACC, B. Polypropylene straws used for fungal preservation. Nine straws of one strain can be put in one hole for 2 ml cryotube. C. Glass capillary used for bacterial preservation. Four glass capillaries can be put in one straw, and three straws can be put in a 2 ml cryotube, and then the cryotubes are put into cane and stored in vapor phase of nitrogen tank.

oil storage or water storage. Each strain in KACC is maintained by at least three different methods. At least one of these is by lyophilization or storage in liquid nitrogen. For liquid nitrogen storage in KACC, glass capillary tube for bacteria and 4 mm polypropylene straw for fungi are used instead of 2 ml cryotube (Fig. 2). These methods are very economic to preserve microorganisms through freezing in LN<sub>2</sub> tank.

#### KACC Database

The KACC constructed an internet-based information system or database to manage the strains' data and promote the microbial strains. It includes not only simple text information on individual microbe, but also images of morphology and DNA sequence data. The database consists of two main parts; one is to manage microbial information such as scientific name, strain data, image of morphology, DNA sequence of taxonomic genes, literature, and media. The other part was developed to contain the process on managing microbes such as introduction, preservation, and distribution of microorganisms. The data bank is constantly updated and always reflects the current status of the collection. The URL of KACC homepage is <http://www.genebank.go.kr>. The homepage also provides information on the 'List of Plant Diseases in Korea', which describes all Korean pathogens and their host plants.

#### Order and Deposit of Strains

The microbial resources on earth are the property of all humankind, and their maintenance and preser-

vation are with no doubt of critical value for all of us. KACC provides and accepts research resources covering various biological materials including bacteria, actinomycetes, yeasts, filamentous fungi and mushrooms.

Cultures present on the KACC website or listed in the KACC catalogue are provided to researchers with facilities suitable for handling living microorganisms. The KACC provides the cultures to overseas researchers free of charge but on an exchange basis.

If you wish to deposit microorganisms to KACC, please contact KACC and give a brief description of the strain prior to sending. When KACC finds the deposit acceptable, the depositor is requested to send the culture with the complete KACC 'Accession Form'. A KACC number will be assigned to the organism after the culture is verified, and the depositor will be informed accordingly.

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