Annex 3. Summary of Open Seminar

FNCA 2009 Workshop on Mutation Breeding Project
Open Seminar

Hosted by	:	**China National Rice Research Institute (CNRRI)** **China-IRRI Joint Research Center on Rice Quality and Nutrition (CIJRC)** **China Atomic Energy Authority (CAEA)** **Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT)**
Date	:	**21st September, 2009**
Venue	:	**Zhejiang Media Hotel, Hangzhou, China**
Total Participants	:	**37 People**

1. Space Mutation for Crop Improvement in China

Dr. Liu Luxiang, Space Breeding Research Center, Institute Crop Science, CAAS

Research progresses of space mutation breeding in China were presented. There are nine sub-projects under the Space Breeding Project undertaken by 224 research groups over the country. From 1998 to 2009, 72 induced mutant varieties were released by space mutagenesis study. New methodology for mutation induction were established such as ^{7}Li ion-beam implantation, mixed energetic particles irradiation and magnetic field-free space and clinostat for microgravity effect were established to conduct research work for revealing the mechanism of space-induced mutation and applying it for crop breeding.

2. Aromatic Rice Research Progress

Dr. Peisong Hu, China National Rice Research Institute

Research progress of aromatic rice was reported. Three excellent inbred rice varieties as Zhongjian 1, Zhongjian 2 and Zhongjian 3 with super quality aromatic rice and aromatic CMS lines Zhong 2 A were released. 1033 aromatic gerplasms were collected and tested to try to find potential new fragrance gene with molecular biology technology. The primary data showed one line could be controlled by one dominant gene and two lines were controlled by two new recessive genes with none-allelic fgr in Chromosome 8. This result will be verified in the future. Mapping of the new fragrance genes were just ongoing. Functional markers were developed and a new deletion site was found in Chromosome 8.

3. Preview pf FNCA Mutation Breeding Project

Dr. Hitoshi Nakagawa, Institute of Radiation Breeding, NIAS

Project Review of FNCA Mutation Breeding Project was deliveried. As on-going activities, 3 Sub-Projects on Orchid, Banana, Rice were introduced. The main Sub-Project now is “Composition or Quality in Rice” and it started in 2007. All member countries participate and focus on Amylose

content as a mutual subject, for improvement of their own varieties.

4. Betazon Lethal Mutant: Molecular Characterization and its Application in Seed Purity-maintaining of Two-line Hybrid Rice.

Dr. Jumin Tu, College of Agriculture and Biotechnology, Zhejiang University

Two rice bentazon-lethal mutants, 8077S and Norin8m were created via γ-ray radiation in an indica photo-thermo-sensitive genic male sterile (P/TGMS) line, W6154S, and a japonica-inbred line, Norin8, respectively. Both mutants showed symptoms to bentazon starting from 100 mg/l, which was about 60-fold, lower than the sensitivity threshold of their wild-type controls. With the molecular biology technology, bel1 and bel2 were found allele each other and both bel1 and bel2 mutations are caused by single base pair deletion and the inner mechanism of phenotype was explained.

5. Improving Nutrition-enhanced and Value-added Components in Rice by Induced Mutation

Dr. Dianxing Wu, Institute of Nuclear Agricultural Sciences, Zhejiang University

The presentation introduced relative conception of nutritionals materials in rice seed. It was expected to improve rice nutrition by induced mutation. RS111, a mutant of high resistance starch, was induced. Some functional mutants were gained. Potential nutritionals product might be recommended to use by diabetes & obesity-affected people.

6. Gene discovery from induced mutants: examples for step by step procedures

Dr. Longbiao Guo, National Key Lab of Rice Biology, CNRRI

Map-based cloning method was introduced. It includes six steps: clear phenotype; constructing of segregating population; linkage analysis between target gene & Markers; chromosome walking from the mapped marker; isolation and sequencing with physical map and complementation test. Through map-based cloning method, two genes, MOC1 and Gn1, had been cloned by CNRRI with its cooperators. The results were published in SCIENCE and NATURE respectively.

7. Creation and Breeding Utilization of Several Japonica Rice Mutants

Dr.Xiaoming Zhang, Zhejiang Academy of Agricultural Sciences Institute of Crop and Nuclear technology Utilization

From 2002 to 2009, 14 Japonica rice varieties had been breeding by the Institute of Crop and Nuclear Technology Utilization Zhejiang Academy of Agricultural Sciences. Glyphosate tolerance mutants were selected from 2500kg radiation seeds of Zhejing 22. Different phenotypes of Japonica rice mutants such as glyphosate tolerance mutant, lesion mimic mutant, roll leaf mutant, easy crisp stem and leaf mutant, yellowish leaf mutant, large angle tillering mutant were induced.

8. Mutation Breeding of Crops through Chronic Gamma Ray Irradiation in FNCA Countries

Dr. Hitoshi Nakagawa, Project Leader of Japan, NIAS

The global trend about mutation breeding research with acute and chronic irradiation through chronic gamma ray irradiation was introduced. Recently, chronic irradiation facilities have been constructed in Malaysia, Korea and Vietnam. The experiment of Japan was also introduced.