4th International Workshop of Integrated Field Science, 3rd International Symposium of Agricultural Science, and The 100th Anniversary of Tohoku University, International Symposium

"Frontiers in Rice Science-from Gene to Field"

6-8 November 2006
Sendai International Center, Sendai, Japan

Program

(Oral session: *presenting author)
6 November

8:00-9:00 Registration

9:00-9:30 **Official opening**
Chair: Makie Kokubun (Tohoku University)
Prof. Yukio Akiba (Dean, Graduate School of Agr. Sci., Tohoku University)
Prof. Masahiko Saigusa (Chair, Organizing Committee)

9:30-12:30 **Session 1: Molecular biology and breeding**

9:30-10:00 Development of a novel breeding method using SNP-based selection of rice genotypes
T. Nishio*, K. Shirasawa, S. Shiokai, H. Maeda and S. Kishitani (Tohoku University, Japan)

10:00-10:20 Transcript profiling of the anoxic rice coleoptile
R. Lasanthi-Kudahettige[1)], L. Magneschi[1)], E. Loreti[2)], S. Gonzali[1)], F.Licausi[1)], G. Novi[1)], A. Alpi[3)], P. Perata*[1)] ([1)]Sant'Anna School of Advanced Studies, Italy; [2)]IBBA-CNR, Italy; [3)]University of Pisa, Italy)

10:20-10:40 Mechanism of nitrogen remobilization in rice
M. Tabuchi, T. Hayakawa and T. Yamaya* (Tohoku University, Japan)

10:40-11:10 Coffee break

11:10-11:30 Molecular study on cytoplasmic male sterility in rice
K. Toriyama* (Tohoku University, Japan)

11:30-11:50 Comparative genome-wide transcriptional profiling of rice pollen and sperm cells
M. B. Singh* (The University of Melbourne, Australia)

11:50-12:10 Toward understanding the molecular mechanism of CW-type cytoplasmic male sterility in rice
S. Fujii* and K. Toriyama (Tohoku University, Japan)

12:10-12:30 Breeding and QTL analysis of rice lines having extremely high cold tolerance at booting stage
K. Nagano*, B. Chiba, K. Sasaki and K. Wagatsuma (Furukawa Agr. Exp. Stn., Japan)

12:30-13:30 Lunch

13:30-16:30 **Session 2: Physiological approaches to enhancement of productivity**

13:30-14:00 Improvement of internal N-use efficiency in rice plants
T. Mae* (Tohoku University, Japan)

14:00-14:20 Changes in ribulose-1, 5-bisphosphate carboxylase/oxygenase turnover is the key to photosyn-

thetic acclimation to elevated CO_2 in rice
S. Seneweera*[1)], A. Makino[2)], J. Conroy[1)] and T. Mae[2)]
([1)]University of Western Sydney, Australia; [2)] Tohoku University, Japan)

14:20-14:40 Rubisco and photosynthesis in rice
A. Makino* (Tohoku University, Japan)

14:40-15:00 Strategies for reversing the yield decline of continuous aerobic rice system
S. B. Peng*, L. Nie, B. A. M. Bouman, R. M. Visperas and H. K. Park (IRRI, Philippines)

15:00-15:30 Coffee break

15:30-15:50 Mechanisms controlling ripening in rice
M. Kokubun*[1)], T. Nakamura[1)] and Wen-Hui Zhang[2)] ([1)]Tohoku University, Japan; [2)]Lioacheng University, China)

15:50-16:10 The impact of free-air CO_2 enrichment (FACE) on growth, yield and quality of rice crops
Y. L. Wang*, L. X. Yang, J. Y. Huang and G. C. Dong (Yanzhou University, China)

16:10-16:30 Identification and characterization of quantitative trait loci in nitrogen utilization of rice
M. Obara*[1)], W. Tamura[1)], H. Ono[1)], T. Ebitani[2)], M. Yano[3)], T. Sato[1)] and T. Yamaya[1)] ([1)]Tohoku University, Japan; [2)]Toyama Agr. Res. Center, Japan; [3)]National Institute of Agrobiological Sci., Japan)

16:30-17:00 Poster introduction

18:00-20:00 Reception (Washington Hotel)

7 November

9:00-12:00 **Session 3: Soil science and production technology**

9:00-9:30 Innovative fertilizer application in rice culture using controlled availability fertilizer
M. Saigusa* (Tohoku University, Japan)

9:30-9:50 Studies on the interaction between upland rice and other crops in intercropping system
Djoko Prajitno* (Gadjah Mada University, Indonesia)

9:50-10:10 Clay mineralogical characteristics of paddy soils in Miyagi prefecture, northeastern Japan
O. Sano*[1)], T. Ito[1)], T. Ando[2)], M. Nanzyo[1)], G. Saito[1)], K. Saito[3)] and M. Saigusa[1)] ([1)]Tohoku University, Japan; [2)]Yamagata Pref. Government, Japan; [3)]Furukawa Agr. Exp. Stan., Japan)

10:10-10:30 Recent trends in the nutrient status of the paddy field soil in Japan and related topics
M. Nanzyo*, T. Takahashi and H. Kanno (Tohoku University, Japan)

10:30-11:00 Coffee break

11:00-11:20 Pedological characteristics and heavy metals cantamination in rice production of the paddy soils in Taiwan
Z. Y. Hseu*[1)], Z. S. Chen[2)] and S. H. Jien[2)] ([1)]National Pingtung University of Sci. and Tech., Taiwan; [2)]National Taiwan University, Taiwan)

11:20-11:40 Development of rice cultivation under a water storage-type deep-irrigation regime
T. Ishibashi*[1)], Y. Goto[1)], M. Saito[2)], T. Nakamura[1)], S. Nakamura[2)] and M. Kokubun[1)] ([1)]Tohoku University, Japan; [2)]Miyagi University, Japan)

11:40-12:00 Heavy metal contamination and remediation of paddy soil in Korea
W. I. Kim*, G. B. Jung, J. S. Lee, J. H. Kim and J. T. Lee (National Institute of Agr. Sci. and Tech., Korea)

12:00-12:20 Soil properties and rice growth in winter flooded paddy field with organic farming
T. Ito*[1)], C. Kon[2)], H. Watanabe[1)], T. Komiyama[1)], N. Tanikawa[1)] and M. Saigusa[1)] ([1)]Tohoku Uni-

versity, Japan; [2)]Aomori Pref. Agric. and Forestry Res. Center, Japan)

12:20-13:20 Lunch

(Poster session)

13:20-15:00 **Poster viewing**

1. QTL analysis of rice grain quality under the high-temperature-stress condition in the grain filling period
   K. Shirasawa[1)], K. Nagano[2)], S. Kishitani[1)] and T. Nishio[1)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan and [2)]Miyagi Furukawa Agr. Exp. Stn., Osaki, Japan)
2. Detection and identification of single nucleotide polymorphisms (SNPs) in *japonica*rice cultivars
   H. Maeda, K. Shirasawa, S. Kishitani and T. Nishio (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)
3. Mapping of a mutant gene for genic male sterility in rice
   S. Shiokai, Y. Hori and T. Nishio (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)
4. Selection of silent mutants in rice for identification of production areas
   Y. Takahashi[1)], Y. Sato[2)], K. Shirasawa[1)], M. Nishimura[3)] and T. Nishio[1)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [2)]Grad. Sch. Agr. and Life Sci., Univ. of Tokyo, Tokyo, Japan; [3)]Institute of Radiation Breeding, National Institute of Agrobiological Sci., Ibaraki, Japan)
5. A novel *wx* allele having non-autonomous retrotransposon-like sequence in its exon
   Y. Hori and T. Nishio (Grad. Sch. Agr. Sci., Tohoku Univ., Japan)
6. Expression analysis of *WRKY16* regulated by *HSP101* promoter in transgenic rice
   X. L. Wu, Y. Shiroto, S. Kishitani and K. Toriyama (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)
7. Molecular mapping of the fertility restorer gene for LD-type cytoplasmic male sterility of rice
   N. Iwata, S. Fujii and K. Toriyama (Grad. Sch. Agr. Sci., Sendai, Japan)
8. An approach toward understanding the function of a CMS-associated gene, *orf79*, of rice
   H. Kojima[1)], T. Kazama[2)], S. Fujii[2)] and K. Toriyama[2)] ([1)]Depart. Agr., Tohoku Univ., Sendai, Japan; [2)] Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)
9. An approach toward producing insect-resistant crops expressing yam tuber lectin (DB1)
   T. Kato[1)], A. Sasaki[2)], T. Ogawa[3)], M. Hori[2)] and K. Toriyama[2)] ([1)]Faculty of Agr., Tohoku Univ., Sendai, Japan; [2)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [3)]Grad. Sch. Life Sci., Tohoku Univ., Sendai, Japan)
10. A novel mutated acetolactate synthase gene conferring specific resistance to pyrimidinyl carboxy herbicides in rice
    A. Okuzaki[1)], T. Shimizu[2)], K. Kaku[2)], K. Kawai[2)] and K. Toriyama[1)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [2)] Kumiai Chemical Industry Co., Shizuoka, Japan)
11. Post-transcriptional regulation of mitochondrial *atp6* RNA by fertility restorer genes in LD-type and BT-type cytoplasmic male sterile rice
    E. Itabashi, T. Kazama and K. Toriyama (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)
12. Changes in the mRNA levels of the *rbc*S gene family during leaf development in rice
    R. Yoshizawa, Y. Suzuki, K. Imai, A. Makino and T. Mae (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)
13. Increased Rubisco content in transgenic rice transformed with “sense” *rbc*S gene.
    Y. Suzuki, M. Ohkubo, H. Hatakeyama, K. Ohashi, R. Yoshizawa, S. Kojima, T. Hayakawa, T. Yamaya, T. Mae and A. Makino (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)
14. Epistatic interaction of QTLs controlling leaf bronzing in rice (*Oryza sativa* L.) grown in a saline paddy field
    H. Takehisa[1)], T. Ueda[2)], Y. Fukuta[3)], M. Obara[4)], T. Abe[5)], M. Yano[2)], T. Yamaya[4)], T. Kameya[1)], A. Higashitani[1)] and T. Sato[1)] ([1)]Grad. Sch. Life Sci., Tohoku Univ., Sendai, Japan; [2)]Depart. Molecular Genetics, Na-

tional Institute of Agrobiological Sci., Tsukuba, Japan; [3)]Japan International Research Center for Agr. Sci., Tsukuba, Japan; [4)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [4)]RIKEN, Wako, Japan)

15. Characterization of quantitative trait loci controlling seed longevity of rice (*Oryza sativa* L.) using chromosome segment substitution lines
K. Sasaki[1)], Y. Fukuta[2)] and T. Sato[1)] ([1)]Grad. Sch. Life Sci., Tohoku Univ., Sendai, Japan; [2)] Japan International Research Center for Agr. Sci., Tsukuba, Japan)

16. S deficiency symptom of rice and amelioration with $CaSO_4$ application
K. Sasaki[1)], T. Hayashi[1)], M. Nanzyo[1)], H. Kanno[1)], T. Takahashi[1)], E. Hasegawa[2)], M. Honna[3)], Y. Aikawa[3)] and K.Yoshihara[3)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [2)]Miyagi Pref. Furukawa Agr. Exp. Sta.; [3)]Hosokura Environment Research Center, Central Research Institute, Mitsubishi Materials Corp.)

17. Changes in available N content of soil with time during soybean cultivation
R. Maekawa[1)], K. Yoshizumi[2)], M. Nanzyo[1)] and T. Takahashi[1)] ([1)]Grad. Sch. Agr. Sci., Sendai, Japan; [2)]National Agr. Research Center for Tohoku Region, Morioka, Japan)

18. Persistence of $CaCl_2$ washing effect for amelioration of Cd contaminated soil
T. Hayashi[1)], T. Kida[1)], M. Nanzyo[1)], T. Takahashi[1)], M. Honna[2)], Y. Aikawa[2)] and K. Yoshihara[2)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [2)]Hosokura Environment Research Center, Central Research Institute, Mitsubishi Materials Corp.)

19. Improvement of rice growth in direct seeding cultivation by application of gibberellin in combination with ethylene-releasing agent ethephon
H. Watanabe, S. Hase and M. Saigusa (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)

20. Population density of aquatic oligochaetes in winter flooded rice fields with organic farming
T. Ito, K. Hara, T. Hirai, C. Kon, A. Mitamura, H. Heinai, M. Kawase and M. Saigusa (Grad. Sch. Agr. Sic., Tohoku Univ., Sendai, Japan)

21. Effects of climatic conditions on degraded rice grain quality in Miyagi Prefecture
N. Miyano and M. Kokubun (Grad. Sch. Agr. Sic., Tohoku Univ., Sendai, Japan)

22. Effect of high night temperature on grain ripening in large-grain rice cultivar, Akita 63
K. Kanno, A. Makino and T. Mae (Grad. Sch. Agr. Sic., Tohoku Univ., Sendai, Japan)

23. Varietal differences in effects of deep-water irrigation on yield and floral sterility of rice cultivars in the cool summer of 2003
T. Ishibashi[1)], M. Saito[2)], M. Kokubun[1)], S. Nakamura[2)] and Y. Goto[1)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [2)]Miyagi Univ., Sendai, Japan)

24. Production of rice plant rich in anti-angiogenic tocotrienol
P. Sookwong[1)], K. Nakagawa[1)], K. Murata[2)] and T. Miyazawa[1)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [2)]Toyama Agr. Res. Center, Japan)

25. Biomass analysis at Miyagi Prefecture in Japan using Landsat/TM data
R. Iwasa[1)], T. Sugihara[1)], F. Namiwa[1)], K. Osawa[2)] and G. Saito[2)] ([1)]Faculty of Agr., Tohoku Univ., Sendai, Japan; [2)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)

26. Analysis of salt-damage on rice by the typhoon 15 in 2004 using SPOT-5/HRG satellite images and DEM data
K. Osawa[1)], M. Hanayama[1)], G. Saito[1)], Y. Kosugi[2)], N. Kosaka[2)], K. Uto[2)], S. Hoshino[2)], A. Imagawa[3)] and K. Oda[3)] ([1)]Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan; [2)]Interdisciplinary Grad. Sch. Sci. Engineering, Tokyo Institute Tech.; [3)]Shonai Branch, Yamagata General Agr. Research Center)

27. Paddy field extraction at Shonai district in Japan using satellite data
F. Namiwa[1)], K. Osawa[1)], G. Saito[1)], A. Imagawa[2)], K. Oda[2)], Y. Kosugi[3)] and N. Kosaka[3)] ([1)]Faculty Agr., Tohoku Univ., Sendai, Japan; [2)]Shonai Branch, Yamagata General Agr. Research Center; [3)]Interdisciplinary Grad. Sch. Sci. Engineering, Tokyo Institute Tech.)

28. Undrerstanding for paddy fields in the world using ASTER data
G. Saito, K. Osawa and M. Hanayama (Grad. Sch. Agr. Sci., Tohoku Univ., Sendai, Japan)

29. Research on production of the ethanol fuel by the rice and construction of the social system