Keiichi OKAZAKI, Ph.D.

Professor

Program: Life and Food Sciences

Area: Agriculture and Bioresources

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Professional Expertise

He obtained the Ph.D. in 1986, in specializing genetic analysis of self-incompatibility of Brassica crops. At present he works in genetic analyses of lilies and Brassica crops. In lilies, he deals with interspecific hybridization, achieving a method to induce unreduced pollen with nitrous oxide gas. In Brassica, he focuses on genetic analysis of disease resistance gene (R-gene) and co-evolution of R-gene and avirulent genes in fungus (fusarium) -plant interaction. In addition, he studies on genetics of agronomic traits like flowering time and glucosinolate contents of Brassica crops

Research Fields of Interest

Genetics and breeding in *Brassica* species

-Analysis of genetic mechanism controlling flowering time

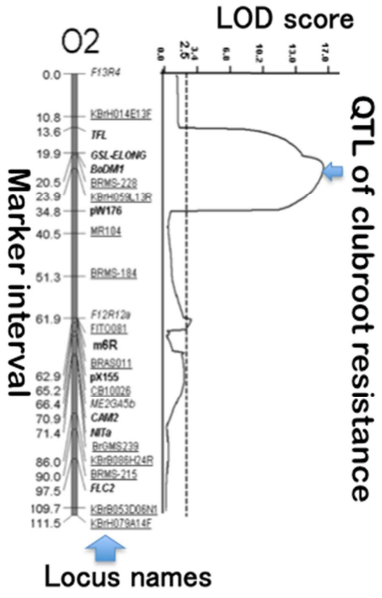
-QTL mapping of disease resistance genes such as fusarium and clubroot disease

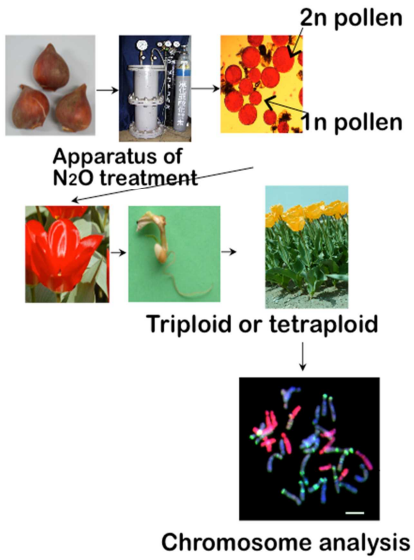
-Isolation of avirulent genes of *Fusarium oxysporum*

Genetics and breeding in lilies and tulips

- Diploid pollen induction using nitrous oxide gas, to tulip and lily breeding

-Interspecific hybridization and production of chromosome addition lines of hybrid lilies





Education

1986: Ph.D. in Agriculture, Graduate School of Agriculture, Tohoku University, Japan

1983: M.S. in Agriculture, Graduate School of Agriculture, Tohoku University, Japan

1981: B.S. in Agriculture, Faculty of Agriculture, Niigata University, Japan

Professional Societies and Activities

1. Japan Horticultural Society
2. Japanese Society of Plant Breeding
3. International society of Horticulture

Major Publications

Papers

[1] Identification of candidate genes for fusarium yellows resistance in Chinese cabbage by differential expression analysis. M. Shimizu, H. Ying, Z. Pu, Y. Ebe, T. Kawanabe, N.Saeki, JM. Taylor, M. Kaji, ES. Dennis, K. Okazaki, **Plant Mol Biol** 85:247–257 (2014)

[2] Production of high yield short duration *Brassica napus* by interspecific hybridization between *B. oleracea* and *B. rapa.* MM. Karim, A. Siddika, NN. Tonu, DM. Hossain,MB. Meah, T. Kawanabe, R. Fujimoto, K. Okazaki, **Breed Sci** 63: 495–502 (2014)

[3] Accumulation of quantitative trait loci conferring broad spectrum clubroot resistance in *Brassica oleracea*. H. Tomita, M. Shimizu, MAU. Doullah, R. Fujimoto, K. Okazaki, **Mol Breeding** 32:889–900 (2013)

[4] Comparison of Positions of QTLs Conferring Resistance to Xanthomonas campestris pv. campestris in *Brassica oleracea*. NN. Tonu, Doullah, MM. Karim, T. Kawanabe, R. Fujimoto, K. Okazaki, **Amer J Plant Sci** 4:11-20 (2013)

[5] Genetic mapping of a fusarium wilt resistance gene in *Brassica oleracea*. Z. Pu, M. Shimizu, Y. Zhang, T. Nagaoka, T. Hayashi, H. Hori, S. Matsumoto, R. Fujimoto and K. Okazaki, **Mol Breeding** 30: 809-818 (2012)

[6] Phylogenetic Analysis of Wild and Garden Tulips Using Sequences of Chloroplast DNA. R. Yanagisawa, T. Kuhara, T. Nishikawa, D. SochackI, A. Marasek-Ciolakowska, K. Okazaki, **Acta Hortcult** 953:103-110, (2012)

[7]N_2O induces mitotic polyploidization in anther somatic cells and restores fertility in sterile interspecific hybrid lilies.Nukui S, Kitamura S, Hioki T, Ootsuka H, Miyoshi K, Sato T, Takatori Y, Oomiya T, Okazaki K. **Breed Sci** 61: 327–337 (2011)

[8] Identification of QTLs that control clubroot resistance in *Brassica oleracea* and comparative analysis of clubroot resistance genes between *B. rapa* and *B. oleracea*. T. Nagaoka, M. A. U. Doullah, S. Matsumoto, S. Kawasaki, T. Ishikawa, H. Hori, K. Okazaki, **Theor Appl Genet** 120:1335–1346. (2010)

[9] Isoform-specific localization of *Brassica rapa* Nitrilases in root infected Plasmodiophora brassicae revealed using in situ hybridization probes. T. Ishikawa, K. Okazaki, T. Nagaoka, K.Itoh, T. Mitsui, H. Hori, **J Plant Growth Regul** 29: 210–222. (2010)

[10] Mapping and characterization of FLC homologs and QTL analysis of flowering time in *Brassica oleracea*. K. Okazaki, K. Sakamoto, R. Kikuchi. A. Saito, E. Togashi, Y. Kuginuki, S Matsumoto, M. Hirai, **Theor Appl Genet** 114:595-608. (2007)

[11] Molecular cloning of *Brassica rapa* nitrilases and their expression during clubroot development. T. Ishikawa, K. Okazaki, H. Kuroda, K. Itoh, T. Mitsui, H. Hori, **Mol Plant Pathol** 8:623-637. (2007)

[12] *Plasmodiophora brassicae*-induced cell death and medium alkalization in Clubroot-Resistant Cultured Roots of *Brassica rapa*. H. Takahashi, T. Ishikawa, M. Kaido, K. Takita, T. Hayakawa, K. Okazaki, K. Ito, T. Mitsui, H. Hori, **J Phytopathology** 154:156-162 (2006)

[13] Development effective screening method for resistance to dark leaf spot (*Alternaria brassicicola*) in *Brassica rapa*. MAUD Doullah, K. Okazaki, **Europ J of Plant pathol** 116:33-43, (2006)

[14] Comparison of the genome structure of the self-incompatibility (S) locus in interspecific pairs of S haplotypes. R. Fujimoto, K. Okazaki, E. Fukai, M. Kusaba, T. Nishio, **Genetics** 173:1157-1167, (2005)

[15] Characterization of *Brassica* S haplotypes lacking S-locus glycoprotein. T. Suzuki, M. Kusaba, M. Matsushita, K. Okazaki and T. Nishio, **FEBS Letters** 482:102-108, (2001)

[16] Induction of 2n gametes and 3n embryo in *Lilium* (*Lilium* x *formolongi* hort.) by nitrous oxide gas treatment. Sato T. K. Miyoshi, K. Okazaki **Acta Horticult** 855:243-245. (2010)

[17] Diploid endosperm formation in *Tulipa* spp. and identification of a 1:1 maternal- to- paternal genome ratio in endosperms of *T. gesneriana* L. H. Mizuochi, H. Matsuzaki, T. Moue, K. Okazaki, **Sex Plant Reprod** 22:27–36. (2009)

[18] Mechanism of action of nitrous oxide gas applied as a polyploidizing agent during meiosis in lilies. S. Kitamura, M. Akutsu, K. Okazaki, **Sex Plant Reprod** 22:9–14. (2009)

[19] Analysis of introgression of *Tulipa fosteriana* genome into *Tulipa gesneriana* using GISH and FISH. A. Marasek, K. Okazaki, **Euphytica** 160:217-230. (2008)

[20] Production of 2n pollen of Asiatic hybrid lilies by nitrous oxide treat-ment. M. Akutsu, S. Kitamura, R. Toda, I. Miyajima, K. Okazaki, **Euphytica** 155:143-152. (2007)

[21] Molecular cloning of *Tulipa fosteriana* rDNA and subsequent FISH analysis yields cytogenetic organization of 5S rDNA and 45S rDNA in *T. gesneriana* and *T. fosteriana*. H. Mizuochi1, A. Marasek, K. Okazaki, **Euphytica** 155:235-248. (2007)

[22] The origin of Darwin hybrid tulips analyzed by flow cytometry, karyotype analyses and genomic in situ hybridization. A. Marasek, H. Mizuochi, K. Okazaki, **Euphytica** 151:279-290. (2006)

[23] Induction of 2n pollen in tulips by arresting the meiotic process with nitrous oxide gas., K. Okazaki, K. Kurimoto, I. Miyajima, A. Enami, H.Mizuochi, Y. Matsumoto, T. Ohya, **Euphytica** 143:101-114, (2005)