Naoki HARADA, Ph.D. (Dr.Agr.)

Associate Professor
Program: Life and Food Sciences
Area: Applied Life and Food Sciences
Undergraduate: Dept. of Applied Biological Chemistry

Professional Expertise

Soil Science, Soil Microbiology, Biodegradation and Bioremediation

Research Fields of Interest

Microbe-plant interaction

- Molecular-based ecological investigations of micro-organisms (N_2-fixers, bacteria, AM fungi, etc.) in farmland

Biodegradation & Bioremediation

- Establishment of bioremediation technologies for soil contaminated with persistent agro-chemicals and organic heavy metals

Restoration of food and agriculture from the Fukushima nuclear disaster

- Distribution and dynamics of radiocesium (Cs-134 and Cs-137) in agricultural soils
- Establishment of cultivation methods to minimize radioactive contamination in crops (rice, soybean, mulberry, etc.)

Education

2001: Ph.D, Graduate School of Agricultural and Life Sciences, Tokyo University, Japan
1990: M.S., Graduate School of Agriculture, Tokyo University, Japan
1988: Bachelor's degree, Faculty of Agriculture, Tokyo University, Japan

Career

2007-present: Faculty of Agriculture, Niigata University
2001-2007: Kowa Research Institute, Kowa Co. Ltd.
1990-1998: Novartis Pharma K.K. (ex-Sandoz Yakuhin K.K.)

Professional Societies and Activities

1. Japanese Society of Soil Science and Plant Nutrition (a member of the board)
2. Japanese Society of Soil Microbiology
3. Japanese Society of Organic Agriculture
4. Japanese Arsenic Scientist's Society

Fig. 1 Soil sampling in rice field affected by radio- actives in Fukushima Prefecture

Fig. 2 Lab seminar in Sado island (Oct. 2009)

Fig.3 Enrichment culturing of pesticide-degrading microorganisms

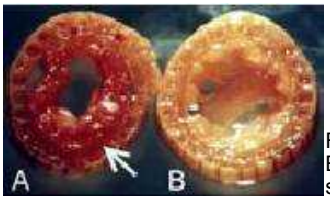

Fig.4 Anoxygenic purple Bacteria emerged in rice straw residues

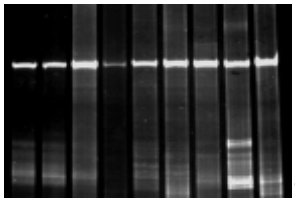

Fig.5 PCR-DGGE fingerprint analysis of *nifH* associated with rice roots

Major Publications

Harada N*, Nishiyama M, Matsumoto S 2001: Inhibition of methanogens increases photo-dependent nitrogenase activities in anoxic paddy soil amended with rice straw. FEMS Microbiology Ecology, Vol.35, No.3, pp.231–238

Harada N*, Nishiyama M, Matsumoto S 2001: Phototrophic N2 fixation suppressed by activated sulfate reduction in anoxic rice soil slurries. Current Microbiology, Vol.42, No.6, pp.393–397.

Harada N*, Otsuka S, Nishiyama M, Matsumoto S 2003: Characteristics of phototrophic purple bacteria isolated from a Japanese paddy soil. Soil Science and Plant Nutrition, Vol.49, No.4, pp.521–526.

Harada N*, Otsuka S, Nishiyama M, Matsumoto S 2005: Influence of indigenous phototrophs on methane emissions from a straw amended paddy soil. Biology and Fertility of Soils, Vol.41, No.1, pp.46–51

Harada N*, Nishiyama M, Otsuka S, Matsumoto S 2005: Effects of inoculation of phototrophic purple bacteria on grain yield of rice and nitrogenase activity in a paddy soil. Soil Science and Plant Nutrition, Vol.51, No.3, pp.361–367

Harada N*, Takagi K, Harazono A, Fujii K, Iwasaki A 2006: Isolation and characterization of microorganisms capable of hydrolysing the herbicide mefenacet. Soil Biology and Biochemistry, Vol.38, No.1 pp.173–179.

Harada N*, Takagi K, Fujii K, Iwasaki A 2006: Transformation of methylthio-s-triazines via sulfur oxidation by strain JUN7, a Bacillus cereus species. Soil Biology and Biochemistry, Vol.38, No.9, pp.2952–2957.

Iwasaki A, Takagi K*, Yoshioka Y, Kojima Y, Fujii K, Harada N 2007: Isolation and characterization of a novel simazine-degrading ß-proteobacterium and detection of genes encoding s-triazine-degrading enzymes. Pest Management Science, Vol.63, No.3, pp. 254–260.

Fujii K, Takagi K, Iwasaki A, Harada N* 2007: Biodegradation of methylthio-s-triazines by Rhodococcus sp. strain FJ1117YT, and production of the corresponding methylsulphinyl, methylsulphonyl, and hydroxy analogues. Pest Management Science, Vol.63, No.3, pp. 261–268.

Harada N*, Nishiyama M, Otsuka S, Matsumoto S 2007: Enhanced methanogenesis in the vicinity of rice straw residues in surface layers of a paddy soil. Soil Microorganisms. Vol.61, No.1, pp. 17–21.

Yamazaki K, Takagi K*, Fujii K, Iwasaki A, Harada N, Uchimura T 2008: Simultaneous biodegradation of chloro- and methylthio-s-triazines using charcoal enriched with a newly developed bacterial consortium. Journal of Pesticide Science, Vol. 33, No. 3, pp. 266–270.

Yamazaki K, Fujii K, Iwasaki A, Takagi K*, Satsuma K, Harada N, Uchimura T 2008: Different substrate specificities of two triazine hydrolases (TrzN) from Nocardioides species. FEMS Microbiology Letters, Vol. 286, Issue 2, pp. 171–177.

Takagi K, Iwasaki A, Kamei I, Satsuma K, Yoshioka Y, Harada N* 2009: Aerobic mineralization of hexachlorobenzene by a newly Isolated pentachloronitrobenzene-degrading Nocardioides sp. strain PD653. Applied Environmental Microbiology, Vol. 75, No.13, pp. 4452–4458.

Harada N*, Takagi K, Baba K, Fujii K, Iwasaki A 2010: Biodegradation of diphenylarsinic acid to arsenic acid by novel soil bacteria isolated from contaminated soil. Biodegradation, Vol. 21, No. 3, pp. 491–499.

Takagi K*, Fujii K, Yamazaki K, Harada N, Iwasaki A 2012: Biodegradation of melamine and its hydroxy-derivatives by a bacterial consortium containing a novel Nocardioides species. Applied Microbiology and Biotechnology, Vol. 94, No. 6, pp. 1647–1656.

Harada N, Nonaka M* 2012: Soil radiocesium distribution in rice fields disturbed by farming process after the Fukushima Dai-ichi Nuclear Power Plant accident. Science of the Total Environment, Vol. 438, pp. 242–247.

Guan L, Hisatomi S, Fujii K, Nonaka M, Harada N* 2012: Enhanced transformation of diphenylarsinic acid in soil under sulfate-reducing conditions, Journal of Hazardous Materials, Vol. 241–242, pp. 355–362.

Guan L, Harada N*, Ono Y, Takahashi T, Fujii K, Liu X, Nonaka M 2013: Effects of diphenylarsinic acid on bacterial and archaeal community structures in an anaerobic paddy soil. Geoderma, Vol. 195–196, pp. 243–250.

Hisatomi S, Guan L, Nakajima M, Fujii K, Nonaka M, Harada N* 2013: Formation of diphenylthioarsinic acid from diphenylarsinic acid under anaerobic sulfate-reducing soil conditions. Journal of Hazardous Materials, Vol. 262, pp. 25–30.

Yoshikawa N*, Obara H, Ogasa M, Miyazu S, Harada N, Nonaka M 2014: 137Cs in irrigation water and its effect on paddy fields in Japan after the Fukushima nuclear accident. Science of the Total Environment, Vol. 481, pp. 252–259.

Suzuki K, Turgay OC, Akca MO, Harada N*, Nonaka M 2014: Molecular diversity of indigenous arbuscular mycorrhizal fungi in three different agricultural regions of Turkey. Soil Science and Plant Nutrition, Vol. 60, pp 367–376.

Guan L, Shiiya A, Hisatomi S, Fujii K, Nonaka M, Harada N* 2015: Sulfate-reducing bacteria mediate thionation of diphenylarsinic acid under anaerobic conditions. Biodegradation, Vol. 26, pp. 29–38.

Rahman MME, Dey TK, Hossain DM, Nonaka M, Harada N* 2015: First Report of white mold on Jackfruit caused by Sclerotinia sclerotiorum in Bangladesh. Australasian Plant Disease Notes, Vol. 10:10, DOI 10.1007/s13314-014-0155-9.

Rahman MME, Hossain DM, Dey TK, Sarker SR, Nonaka M, Harada N* 2015: First report of white mould caused by Sclerotinia sclerotiorum on marigold (Tagetes erecta) in Bangladesh. Journal of Plant Pathology, Vol. 97(2), 398.

Harada N*, Motojima S, Igarashi K, Nonaka M 2015: 137Cs distribution in Mulberry (Morus alba) after the Fukushima Dai-ichi Nuclear Power Plant Accident and effect of spray application of a liquid potassium fertilizer onto trunk surface. Radioisotopes, Vol. 64(10), pp. 613–619. (in Japanese)

Harada N*, Ito S, Nihei N, Nonaka M 2015: Radiocesium contamination of soybean (Glycine max) produced with no fertilization in 2014 - A case study in Minamisoma City, Fukushima Prefecture, Japan -. Japanese Journal of Organic Agriculture Science, Vol. 7(2), pp. 35–41. (in Japanese)

Akça MO, Hisatomi S, Takemura M, Harada N, Nonaka M, Sakakibara F, Takagi K, Turgay OC* 2016: 4,4-DDE and endosulfan levels in agricultural soils of the Çukurova region, Mediterranean Turkey. Bulletin of Environmental Contamination and Toxicology, Vol. 96(3), pp. 376–382.

Rahman MME, Hossain DM, Suzuki K, Shiiya A, Suzuki K, Dey TK, Nonaka M, Harada N* 2016: Suppressive effects of Bacillus spp. on mycelia, apothecia and sclerotia formation of Sclerotinia sclerotiorum and potential as biological control of white mold on mustard. Australasian Plant Pathology, Vol. 45(1), pp. 103–117.

Miyazu S, Yasutaka T, Yoshikawa N, Tamaki S, Nakajima K, Sato I, Nonaka M, Harada N 2016: Measurement and estimation of radiocesium discharge rate from paddy field during land preparation and mid-summer drainage. Journal of Environmental Radioactivity, Vol. 155–156, pp. 23–30.

Islam MM, Hossain DM, Rahman MME, Suzuki K, Narisawa T, Hossain I, Meah MB, Nonaka M, Harada N* 2016: Native Trichoderma strains isolated from Bangladesh with broad spectrum of antifungal action against fu ngal phytopathogens. Archives of Phytopathology and Plant Protection. (in press)

Buto T, Suzuki K, Kaidzu T, Narisawa T, Turgay OC, Ortas I, Harada N*, Nonaka M 2016: Arbuscular mycorrhizal fungal community of wheat under long-term mineral and organic amendments in semi-arid Mediterranean Turkey. Arid Land Research and Management. (in press)