

## マイコトキシン国際シンポジウム

真菌医学研究センターは、病原真菌の研究と真菌による感染症・中毒症の成因並びに制圧に関する研究を行うための全国共同利用施設、文部省中核的研究機関 (COE) として設立された。高分子活性分野教授 赤尾三太郎が平成10-11年のマイコトキシン研究会会長に選出されたことを機会に、マイコトキシンに関して現在直面している諸問題についての国際シンポジウムを開催することを提案し、真菌医学研究センターの教職員とマイコトキシン研究会幹事から成る組織委員会が組織された。組織委員会はシンポジウムで討議する課題の設定や研究発表者の選定を行うと共に、一般参加者による示説研究発表とワークショップ研究発表の場を設け、ホームページや関連学会学術誌で広報を行うと共に、ポスターを作製して国内外の研究者に本シンポジウムへの参加を呼びかけた。幸い、文部省国際シンポジウム開催経費助成、千葉大学の国際集會開催経費助成、薬学研究奨励財団の海外からの研究者招へい補助金、千葉コンベンションビューローのコンベンション開催助成金を得て準備を進めることが出来たので、円滑なる運営が可能となり、海外の研究者60余人、国内研究者約200人が参集し、本シンポジウムは盛大な研究集會となった。

真菌は数々の発酵食品の製造に利用されているが、それらの中には穀物、食品、飼料などに着生して毒性物質 (マイコトキシン) を産生し、これら食物を汚染するものがある。現在、マイコトキシン生合成機構の解明、マイコトキシン汚染を防止・除去する方法、有害有機溶媒を用いないマイコトキシン分析法等について急速の進展が見られている。また、有毒物質から生物や自然環境を保全するための国際協力が進められており、我国や欧米の研究者は中国、東南アジアの研究者と協力し、食物のマイコトキシン汚染と癌その他の疾病発生との関連について調査を行っている。昨年我国において、輸入した牧草に着生した真菌エンドファイトがマイコトキシンを産生し、牛などの家畜に重篤な中毒症を引き起こした事件がニュースとして報道された。本シンポジウム組織委員会は、5つの部会を設置し、内外の専門家を招へいし、

これらの課題について研究発表や討論を行った。

第1部会では、マイコトキシン生合成に関与する遺伝子群とそれらの転写活性を調節する遺伝子群に関する最新の研究が紹介された。第2部会では、フザリウム菌の産生するマイコトキシンについて新たな発見、中国の食道がん高発地域における疫学調査結果、米国食品薬品局が昨年完了したフモニシンB1の発癌性に関する研究が紹介された。第3部会では、マイコトキシン産生菌の着生防止、汚染穀物顆粒の検出、食品からのマイコトキシン除去について有効な方法が紹介された。第4部会では、米国、ニュージーランド等で発生したエンドファイトによる家畜への被害、原因となったトキシンの化学構造、分析法、並びに、我が国におけるエンドファイト汚染の実態が紹介された。第5部会では、酵素免疫・抗体を用いた、或いは、無害な溶媒を用いた高速液体クロマトグラフィーなど安全かつ高感度・迅速なマイコトキシン分析法が紹介された。

本シンポジウムはマイコトキシンによる中毒の防止に寄与すると共に、今後のマイコトキシン研究の発展に大いに寄与することが期待される。本シンポジウムの講演は論文としてマイコトキシン研究会の学術雑誌、MYCOTOXINS 特集号に収録され単行本として出版されるが、この本が今後のマイコトキシン研究の基礎となることを期待している。

International Symposium of Mycotoxicology '99  
(ISMYCO '99)

Mycotoxin Contamination:  
Health Risk and Prevention Project

September 9 (Thu) - 10 (Fri), 1999

Convention Hall of Chiba University, Keyaki Kaikan  
Chiba, Japan

Under the Auspices of

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nese Association of Mycotoxicology

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turers)

Chiba Convention Bureau

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## Daily Calendar

Toast Master : Goto T

### Wednesday, September 8

- 15:00 p.m.~17:30 p.m. Keyaki Kaikan, 3rd Floor,  
Conference Room  
Workshop 1 : Recent Status of  
Mycotoxin Research in Asian  
Countries  
Chairperson : Ichinoe M, Arim  
R H
- 19:00 p.m.~21:30 p.m. Hotel Sungarden Chiba, 4th  
floor, Room Hakuho-no-Ma  
Workshop 2 : Recent Advances  
in Toxicology of Mycotoxins  
Chairperson : Endou H, Richard  
J L

### Thursday, September 9, Keyaki Kaikan

- 08:30 a.m.~ Registration  
09:00 a.m.~09:15 a.m. Opening Addresses  
Akao M  
Isono K, President of Chiba  
University
- 09:20 a.m.~11:20 a.m. Symposium Session 1 : Regu-  
lation of Mycotoxin Biosynthesis  
Chairperson : Yabe K, Proctor  
R H
- 11:20 a.m.~12:00 noon Special Lecture  
Ueno Y, Head of Tochigi  
Institute of Clinical Pathology  
Chairperson : Kumagai S
- 12:00 noon~13:00 p.m. Lunch
- 13:00 p.m.~15:00 p.m. Symposium Session 2 :  
Human and Animal Health Risk  
of Mycotoxins  
Chairperson : Yoshizawa T,  
Howard P C
- 15:00 p.m.~17:00 p.m. Poster Session  
Chairperson : Yoshizawa T,  
Gouda Y,
- 17:00 p.m.~ 19:00 p.m. Mixer

### Friday, September 10, Keyaki Kaikan

- 09:15 a.m.~11:30 a.m. Symposium Session 3 :  
Elimination of Mycotoxins  
from Food  
Chairperson : Goto T, Wicklow  
D T
- 11:30 a.m.~12:00 noon Memorial Addresses for  
the late Dr. C.W. Hesseltine  
Kurata H, Richard J L
- 12:00 noon~ 13:00 p.m. Lunch
- 13:00 p.m.~15:00 p.m. Symposium Session 4 :  
Endophytes and Endophytic  
Toxins  
Chairperson : Koga H, Latch G  
C M
- 15:00 p.m.~15:20 p.m. Coffee Break
- 15:20 p.m.~17:20 p.m. Symposium Session 5 : Safe  
and Clean Analysis of Myco-  
toxins  
Chairperson : Kamimura H,  
Richard J L
- 17:20 p.m.~17:30 p.m. Closing Address  
Yoshizawa T
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### Symposia

- Session 1 : Regulation of Mycotoxin Biosynthesis  
Chairperson : Kimiko Yabe, Robert H Proctor
1. Genetics of mycotoxin biosynthesis in *Fusarium*.  
Robert H Proctor (National Center for Agricul-  
ture Utilization Research, USDA, USA)
  2. Sterigmatocystin biosynthesis and asexual sporu-  
lation in *Aspergillus nidulans*  
JaeHyuk Yu (Cereon Genomics, LLC, USA)
  3. Aflatoxin biosynthesis and genes of *Aspergillus*  
*parasiticus*

Kimiko Yabe (National Food Research Institute, Japan)

4. Koji molds and mycotoxin production genes  
Ken-Ichi Kusumoto (Chugoku National Agricultural Experiment Station, Japan)
5. Phylogenetic relationship and classification of mycotoxin producers using the cytochrome B gene  
Koji Yokoyama (Chiba University, Japan)

#### Session 2: Human and Animal Health Risk of Mycotoxins

Chairperson: Takumi Yoshizawa, Paul C. Howard

1. New hemorrhagic toxins produced by *Fusarium* species: chemistry and toxicology  
Yin-Won Lee (Seoul National University, Korea)
2. The effects of *Fusarium* mycotoxins on host resistance to infectious diseases  
Yoshiko Sugita-Konishi (National Institute of Infectious Diseases, Japan)
3. Carcinogenicity of fumonisin B1 in a two-year bioassay with Fischer 344 rats and B6C3F1 mice  
Paul C. Howard (National Center for Toxicological Research, US FDA, USA.)
4. Risk assessment of mycotoxins in staple foods from the high-risk area for human esophageal cancer in China  
Takumi Yoshizawa (Kagawa University, Japan)
5. Mycotoxins in the UK food supply: actions taken to assess and reduce exposure  
Paul Brereton (Central Science Laboratory, Ministry of Agriculture, Fishery, and Food, United Kingdom)

#### Session 3: Elimination of Mycotoxins from Food

Chairperson: Tetsuhisa Goto, Donald T Wicklow

1. Biological control of aflatoxin and cyclopiazonic acid contamination of peanuts  
Richard Cole (National Peanut Laboratory, USDA, USA)
2. Near infra red detection of internally moldy nuts

Susumu Hirano (Morinaga Co. Ltd., Japan)

3. Machine vision system for automated detection of aflatoxin contaminated pistachio nuts  
Tom C Pearson (Cereal Processing Research Unit, Western Regional Research Center, USDA, USA)
4. Removal of mycotoxins during food processing  
Hisashi Kamimura (Tokyo Metropolitan Research Laboratory of Public Health, Japan)
5. Reduction of mycotoxins contamination by processing grain  
Kenji Tanaka (National Food Research Institute, Japan)
6. Prevention of mycotoxin contamination on meat and meat products  
Rainer Scheuer (Institute for Microbiology and Toxicology, Federal Centre for Meat Research, Germany)

#### Session 4: Endophytes and Endophytic Toxins

Chairperson: Hironori Koga, Gary C. M. Latch

1. *Neotyphodium*-grass interactions  
Gary CM Latch (Pastoral Agriculture Research Institute, New Zealand)
2. Genetic analysis of biosynthesis and roles of anti-herbivore alkaloids produced by grass endophytes  
Christopher L. Schardl (University of Kentucky, USA)
3. Chemistry of endophyte mycotoxins  
Teruhiko Yoshihara (Hokkaido University, Japan)
4. Incidence of endophytic fungi in perennial ryegrass, tall fescue and meadow fescue in Japan and imported grasses, with special reference to ryegrass staggers  
Hironori Koga (Ishikawa College of Agriculture, Japan)
5. Ryegrass staggers in Japan induced by consumption of ryegrass straw imported from America  
Shigeru Miyazaki (National Institute of Animal Health, Japan)

Session 5 : Safe and Clean Analysis of Mycotoxins

Chairperson : Hisashi Kamimura, John L Richard

1. A rapid fluorometric test for aflatoxins in grains  
John L Richard (Romer Laboratories, Inc., USA)
2. Detection of endophyte toxins by ELISA assay  
Ian Garthwaite (Pastoral Agriculture Research Institute, New Zealand)
3. Clean analysis of mycotoxin by HPLC  
Hiroshi Akiyama (National Institute of Health Sciences, Japan)
4. Detection of fumonisins by ELISA method  
Ayumi Nagahara (Kikkoman Corporation, Japan)
5. Mycotoxin analysis using immunoaffinity columns  
Masahiro Nakajima (Nagoya City Public Health Research Institute, Japan)

Special Lecture

Risk from cross-exposure to natural toxins

Yoshio Ueno (Head of Tochigi Institute of Clinical Pathology, Japan)

Chairperson : Susumu Kumagai

Poster Session

Chairperson : Takumi Yoshizawa, Yukihiro Goda

- P.1 Rapid and sensitive tandem immunoaffinity column cleanup and high performance liquid chromatography for the determination of *Fusarium* mycotoxin deoxynivalenol in whole wheat flour and corn meal  
Yu W and Chu FS (Food Research Institute, UW-Madison, USA)
- P.2 Modification of extraction procedure for tenuazonic acid in cereals and its determination by HPLC with photodiode array detection  
Li F-Q, Kawamura O and Yoshizawa T (Kagawa University, Japan)
- P.3 Successful application of multifunctional column clean-up and derivatization reaction method for the analysis of aflatoxins in formula feed  
Shirai Y, Sekiguchi Y, Shimomura M and Hayakawa T (Fukuoka Fertilizer and Feed Inspection, Ministry of Agriculture, Forestry and Fisheries, Japan)
- P.4 Occurrence of aflatoxins in corn and its processed products in the Philippines : development and application of a minicolumn method  
Arim RH, Aguinaldo AR, and Yoshizawa T (Food and Nutrition Research Institute, Metro Manila, Philippines and Kagawa University, Japan)
- P.5 Quantitation of aflatoxin B<sub>1</sub> in corn seeds and ground peanuts by ELISA method using in-house monoclonal antibody preparation  
Lipigorngoson S, Suttajit M and Limtrakul P (Chiang Mai University, Thailand)
- P.6 Development of ELISA method for aflatoxin B<sub>1</sub> using monoclonal antibody precipitated from mouse ascites fluid by ammonium sulfate  
Lipigorngoson S, Limtrakul P and Suttajit M (Chiang Mai University, Thailand)
- P.7 Enzyme linked immunosorbent assay (ELISA) for aflatoxin M<sub>1</sub>  
Rachmawati S and Priadi A (Research Institute for Veterinary Science, Indonesia)
- P.8 Current detection of common mold species by ELISA using cocktail monoclonal antibodies against extracellular polysaccharide  
Shon D-H, Kwak B-Y, Kwon C-H and Kwon B-J (Korea Food Research Institute, National Veterinary Research and Quarantine Service, Korea)
- P.9 Effect of roasting on deoxynivalenol, nivalenol and zearalenone in naturally contaminated barley and wheat  
Yumbe B, Kawamura O and Yoshizawa T (Kagawa University, Japan)
- P.10 Decontamination and detoxification of aflatoxins and its mutagenicity in Thai foods  
Suttajit M (Chiang Mai University, Thailand)
- P.11 Food-process contamination of aflatoxins in rice noodle

- Suttajit M, Roytrakul S and Kunanuwatchaidet P (Chiang Mai University, Thailand)
- P.12 Aflatoxin contamination of agricultural commodities and fungi isolated from those in Indonesia  
Goto T, Ginting E, Antarlina SS, Utomo JS, Ito Y and Nikkuni S (National Food Research Institute, Japan, Research Institute for Legume and Tuber Crops, Indonesia, National Research Institute of Vegetables, Ornamental Plants and Tea, Japan and Japan International Research Center for Agriculture Science, Japan)
- P.13 A survey on mycotoxin in Bangkok food and feed  
Suprasert D and Kamimura H (Ministry of Public Health, Thailand and Tokyo Metropolitan Research Laboratory of Public Health, Japan)
- P.14 Survey of aflatoxins contamination on peanuts and peanut products  
Souza GD, Costa LLF and Scussel VM (Federal University of Santa Catarina, Brazil)
- P.15 Aflatoxin contamination in commercial foods and foodstuffs in Tokyo: 1982-1996  
Tabata S (Tokyo Metropolitan Research Laboratory of Public Health, Japan)
- P.16 Mycotoxin contamination and its relation to food habits in the south of Brazil  
Scussel VM (Federal University of Santa Catarina, Brazil)
- P.17 Esophageal cancer in southern region of Brazil  
Scaff R and Scussel VM (Federal University of Santa Catarina, Brazil)
- P.18 Hepatocellular carcinoma and hepatic diseases in adult patients from Santa Catarina State, Brazil  
Haas P and Scussel VM (Federal University of Santa Catarina, Brazil)
- P.19 Production performance of poultry layers fed with aflatoxin-contaminated feeds  
Begino ET (Bureau of Animal Industry, Philippines)
- P.20 Comparison of the effect of dietary selenium and zinc supplementation on growth and immune response between *Salmonella* and aflatoxin inoculate, and *Salmonella*-inoculated chick groups  
Hegazy SM and Adachi Y (Tanta University, Egypt and Ibaraki University, Japan)
- P.21 Multigene evidence supports the distinction of new species *Aspergillus bombycis* from *A. nomius*  
Peterson SW, Ito Y and Goto T (National Center for Agricultural Utilization Research, USDA, USA and National Research Institute of Vegetables, Ornamental Plants and Tea, Japan)
- P.22 Expression of 14-3-3 $\beta$  antisense mRNA suppresses the tumorigenicity of aflatoxin B<sub>1</sub>-induced rat hepatoma K2 cells  
Sugiyama A and Tashiro F (Science University of Tokyo, Japan)
- P.23 Mechanism of T-2 toxin-induced thymic apoptosis: noninvolvement of endogenous TNF- $\alpha$  and glucocorticoid  
Nagase M, Islam Z, Alam MM, Yoshizawa T and Sato N (Kagawa University, Japan)
- P.24 *Aspergillus flavus* genotypic influence on aflatoxin and bright greenish-yellow fluorescence of corn kernels  
Wicklow DT (National Center for Agricultural Utilization Research, USDA, USA)
- P.25 Carbon-assimilation pattern and fruit-degrading enzymes in an apple blue mold, *Penicillium expansum*  
Kimura S, Ohno N, Fukuda H, Takahashi H, Shinoyama H and Fujii T (Chiba University, Wayo Women's University and Public Health Laboratory, Japan)
- P.26 Toxigenic fungi of imported mold-ripened cheese  
Shimada T and Ichinoe M (Tokyo Kasei University, Japan)
- P.27 Fungal colonization of rice grains in some Asian countries  
Igarashi Y and Ichinoe M (Tokyo Kasei University, Japan)
- P.28 The blooming of *Microcystis aeruginosa* kutz in the reservoir of Maekunang Udomtara Dam,

- Chiang Mai, Thailand
- Peerapornpisal Y, Sonchichai W, Somdee T, Mulsin P, Prommana P and Rott E (Chiang Mai University, Thailand and Innsbruck University, Austria)
- P.29 Distribution and characterization of aflatoxin-producing fungi in sugarcane, peanuts and green coffee from Vietnam—Preliminary report—  
Takahashi H, Kase N, Yazaki H, and Ichinoe M (Public Health Laboratory of Chiba Prefecture and Tokyo Kasei University, Japan)
- P.30 Productivity of trichothecene mycotoxins by *Fusarium kyushuiense* O'Donnell and Ueno sp. nov.  
Tanaka T, Yoneda A, Kojima N, Inoue S, O'Donnell K and Ueno Y (Kobe Institute of Health, Japan, US Department of Agriculture, USA and Science University of Tokyo, Japan)
- P.31 Mycotoxins of *Fusarium crookwellense* isolated from maize cultivated in Hokkaido  
Sugiura Y and Tanaka T (Science University of Tokyo and Kobe Institute of Health Japan)
- P.32 Distribution of thermotolerant and cyclosporin-producing *Fusarium solani* in crop field in Japan  
Sugiura Y, Kurachi R and Ueno Y (Science University of Tokyo and Tochigi Institute of Clinical Pathology, Japan)
- P.33 Toxic interaction of polyhydroxyanthraquinone mycotoxins with planar phospholipid membrane  
Muto M, Kitagawa A and Kawai K (Gifu University and Chukyo Woman's University, Japan)
- P.34 Mitochondria toxicities of *Islandicum* anthraquinone and anthraquinoid pigments  
Kawai K, Kitagawa A, Fukushima K and Miyaji M (Chukyo Women's University and Chiba University, Japan)
- P.35 Chetomium mycotoxins with antiinsectan or antifungal activity  
Wicklow DT, Dowd PF and Gloer JB (National Center for Agricultural Utilization Research, USDA and University of Iowa, USA)
- P.36 Some fungal metabolites having broad biological activity spectrum

Fujimoto H, Nagano J, Satou Y, Fujimaki T, Hayashi N, Okuyama E and Yamazaki M (Chiba University, Japan)

- P.37 Acctom™ test kit for DON, a rapid ELISA technology  
Malone B, Richard JL, Humphrey CW and Bond K (Romer TM Labs, Inc., USA)
- P.38 Decontamination of aflatoxin in food using microwave oven  
Chinaphuti A (Plant Pathology and Microbiology Division, Department of Agriculture, Thailand)

### Workshops

Workshop 1: Recent Status of Mycotoxin Research in Asian countries

Wednesday, September 8, 15:00 p.m.~17:30 p.m.

Keyaki Kaikan, 3rd floor, Conference Room

Chairperson: Masakatu Ichinoe, Rosario H. Arim

1. Recent status of mycotoxin research in the Philippines  
Rosario H Arim (Department of Science and Technology, Food and Nutrition Research Institute, the Philippines)
2. Recent status of mycotoxin research in Thailand  
Duangchan Suprasert (Department of Medical Sciences, Ministry of Public Health, Thailand)
3. Aflatoxins in Malaysian food  
Norhayati B Ali (Department of Chemistry, Malaysia)
4. Natural occurrence of mycotoxins in foods in China  
Xue-Yun Luo (Institute of Food Safety Control and Inspection, Ministry of Health, China)
5. Current status of mycotoxin studies in Vietnam  
Masakatsu Ichinoe (Tokyo Kasei University, Japan)
6. Aflatoxin situation in Syria  
M Imadeddin Nouredin (Ministry of Supply and Internal Trade, Syria)

Workshop 2: Recent Advances in Toxicology of Mycotoxins

Wednesday, September 8, 19:00~21:30

Hotel Sungarden Chiba, 4th floor, Hakuho-no-Ma 1-11-1 Chuo, Chuo-ku, Chiba-city. Five minutes walk from JR Chiba Station TEL 043-224-1131, Chairperson: John L. Richard, Hitoshi Endou

1. Modulation of microfilament by hepatotoxic cyclic peptide, cyclochlorotin  
Kazuhiro Ohmi (National Childrens Medical Research Center, Japan)
2. Induction of apoptotic cell death by trichothecenes  
Hiroki Okumura (Tochigi Institute of Clinical Pathology, Japan)
3. Nivalenol as a possible risk for IgA nephropathy

Fumihiko Hinoshita (International University of Health and Welfare, Japan)

4. Transmembrane transport of ochratoxin A and other mycotoxins by cloned organic anion transporters  
Hitoshi Endou (Kyorin University School of Medicine, Japan)
5. Possible involvement of glucocorticoid hormones in aflatoxin B<sub>1</sub> hepatocarcinogenesis as a tumor promotor  
Fumio Tashiro (Science University of Tokyo, Japan)
6. Proteinphosphatase as a target of fumonisins  
Hoyoku Nishino (Kyoto Prefectural University of Medicine, Japan)