ANNUAL REPORTS
OF
INTERNATIONAL CENTER FOR BIOTECHNOLOGY
OSAKA UNIVERSITY

VOL. 31, 2009

DIRECTOR/EDITOR
SATOSHI HARASHIMA

EDITOR
TAKUYA NHIRA

ASSISTANT EDITOR
KAZUHITO FUJIYAMA
HIROSHI KINOSHITA
SHIGERU Kitani
ryo Misaki

SECRETARY
NAOKO OSE
FUMIKO TOMOMATSU
YUKIKO SETO
AYAKO TOMIO

The Annual Report is published to record the activity of the International Center for Biotechnology (ICBiotech) and issued once in each fiscal year. It contains scientific articles, progress reports, letters, and announcement from the Center. This volume includes publications by the former participants in UNESCO postgraduate courses. The editor welcomes the submission of appropriate articles from all persons who are concerned with the activity of the Center. All the contributions, however, will be reviewed by editors before their acceptance. The scientific paper herein should be treated as personal communications and not treated as original publications. The Annual Report is distributed upon request to the International Center for Biotechnology, Osaka University, 2-1 Yamadaoka, Suita, Osaka 565-0871, Japan (e-mail: info@icb.osaka-u.ac.jp). The editors are very grateful to Ms. Fumiko Sawazumi for her technical help.
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yeast Protein Phosphatases Ptp2p and Msg5p Are Involved in G1-S Transition, CLN2 Transcription, and Vacuole Morphogenesis</td>
<td>1</td>
</tr>
<tr>
<td>Hermansyah, M. Sugiyama, Y. Kaneko, and S. Harashima</td>
<td></td>
</tr>
<tr>
<td>Advances in Molecular Methods to Alter Chromosomes and Genome in the Yeast Saccharomyces cerevisiae</td>
<td>14</td>
</tr>
<tr>
<td>M. Sugiyama, K. Yamagishi, Yeon-Hee Kim, Y. Kaneko, M. Nishizawa, and S. Harashima</td>
<td></td>
</tr>
<tr>
<td>Genome-wide Identification of Genes Involved in Tolerance to Various Environmental Stresses in Saccharomyces cerevisiae</td>
<td>22</td>
</tr>
<tr>
<td>C. Auesukaree, A. Damneransawad, M. Kruatrachue, P. Pokethitiyook, C. Boonchird, Y. Kaneko, and S. Harashima</td>
<td></td>
</tr>
<tr>
<td>Genetic Analysis of Saccharomyces cerevisiae Thermotolerant Strain</td>
<td>32</td>
</tr>
<tr>
<td>B. Suthee, M. Sugiyama, Y. Kaneko, C. Boonchird, and S. Harashima</td>
<td></td>
</tr>
<tr>
<td>Ethanol Production from Biomass by Consolidated Continuous Solid State Fermentation System</td>
<td>33</td>
</tr>
<tr>
<td>Molecular Breeding of Yeast Displaying Tolerance to High Temperature and Low pH for High-level Bioethanol Production</td>
<td>34</td>
</tr>
<tr>
<td>S. Harashima</td>
<td></td>
</tr>
<tr>
<td>Identification of mokB Involved in Monacolin K Biosynthesis in Monascus pilosus</td>
<td>35</td>
</tr>
<tr>
<td>K. Sakai, H. Kinoshita, and T. Nihira</td>
<td></td>
</tr>
<tr>
<td>Hierarchical Control of Virginiamycin Production in Streptomyces virginiiae by Three Pathway-specific Regulators: VmsS, VmsT and VmsR</td>
<td>41</td>
</tr>
<tr>
<td>N. Pulsawat, S. Kitani, E. Fukushima, and T. Nihira</td>
<td></td>
</tr>
<tr>
<td>MlcR, a Zinc Cluster Activator Protein, Is Able to Bind to a Single (A/T)CGG Site of Cognate Asymmetric Motifs in the ML-236B (Compactin) Biosynthetic Gene Cluster</td>
<td>51</td>
</tr>
<tr>
<td>S. Baba, H. Kinoshita, M. Hosobuchi, and T. Nihira</td>
<td></td>
</tr>
</tbody>
</table>
Characterization of a Regulatory Gene, aveR, for the Biosynthesis of Avermectin in *Streptomyces avermitilis*

Improvement of Compactin (ML-236B) Production by Genetic Engineering in Compactin High-producing *Penicillium citrinum*
S. Baba, Y. Abe, T. Suzuki, C. Ono, K. Iwamoto, T. Nihira, and M. Hosobuchi 67

Geranylgeranyl Diphosphate Synthase Genes in Entomopathogenic Fungi
S. Singkaravanit, H. Kinoshita, F. Ihara, and T. Nihira 75

Control of Secondary Metabolism by faxX, which Is Involved in the γ-butyrolactone Biosynthesis of *Streptomyces lavendulae* FRI-5

Null Mutation Analysis of an afsA-family Gene, barX, That Is Involved in Biosynthesis of the γ-butyrolactone Autoregulator in *Streptomyces virginiae*
Yong Jik Lee, S. Kitani, and T. Nihira 95

O-Glycosylation of Protein Subpopulations in Alcohol-extracted Rice Proteins

Change of Glycosylation Pattern with Extension of Endoplasmic Reticulum Retention Signal Sequence of Mouse Antibody Produced by Suspension-cultured Tobacco BY2 Cells
K. Fujiyama, R. Misaki, Y. Sakai, T. Omasa, and T. Seki 114

Cloning and Characterization of Cytidine Monophosphate-3-deoxy-D-manno-octulosonate Synthetase from *Arabidopsis thaliana*
R. Misaki, H. Kajiura, K. Fujii, K. Fujiyama, and T. Seki 122

Molecular Cloning and Gene Expression Analysis of Tomato Endo-β-N-acetylglucosaminidase, an Endoglycosidase Involved in the Production of High-mannose Type Free N-glycans during Tomato Fruit Ripening
K. Nakamura, M. Inoue, M. Maeda, R. Nakano, K. Hosoi, K. Fujiyama, and Y. Kimura 125
Biochemical and Immunological Characterization of the Plant-derived Candidate Human Immunodeficiency Virus Type 1 Mucosal Vaccine CTB-MPR

N. Matoba, H. Kajiura, I. Chern, J. D. Doran, M. Bomsel, K. Fujiyama, and T. S. Mor

Analysis of CMP-sialic Acid Transporter-like Proteins in Plants


Effect of Cell-surface Hydrophobicity on Bacterial Conversion of Water-immiscible Chemicals in Two-liquid-phase Culture Systems


Characterization of an Organic-solvent-tolerant Brevibacillus agr Strain 13 Able to Stabilize Solvent/Water Emulsion

A. Kongpol, T. Pongtharangkul, J. Kato, K. Honda, H. Ohtake, and A. S. Vangnai

Systematic Screening of Escherichia coli Single-gene Knockout Mutants for Improving Recombinant Whole-cell Biocatalysts

Ying Zhou, T. Minami, K. Honda, T. Omasa, and H. Ohtake

An Approach to Peak Detection in GC-MS Chromatograms and Application of KNApSAcK Database in Prediction of Candidate Metabolites


DrEFTIR: The Data Mining Software for Fourier Transform Near-infrared Reflectance Spectroscopy Focused on Food Metabolic Finger Printing

T. Ikeda, Md. Altaf-Ul-Amin, H. Takahashi, and E. Fukusaki

Reproductive Organs Regulate Leaf Nitrogen Metabolism Mediated by Cytokinin Signal

D. Igarashi, Y. Izumi, Y. Dokiya, K. Totsuka, E. Fukusaki, and C. Ohsumi

High-resolution Spatial and Temporal Analysis of Phytoalexin Production in Oats

Histochemical Study of Detailed Laticifer Structure and Rubber Biosynthesis-related Protein Localization in *Hevea brasiliensis* Using Spectral Confocal Laser Scanning Microscopy
T. Sando, T. Hayashi, T. Takeda, Y. Akiyama, Y. Nakazawa, E. Fukusaki, and A. Kobayashi

Highly Sensitive and Accurate Profiling of Carotenoids by Supercritical Fluid Chromatography Coupled with Mass Spectrometry
A. Matsubara, T. Bamba, H. Ishida, E. Fukusaki, and K. Hirata

Non-targeted Metabolite Fingerprinting of Oriental Folk Medicine *Angelica acutiloba* Roots by Ultra Performance Liquid Chromatography Time-of-flight Mass Spectrometry
S. Tianniam, T. Bamba, and E. Fukusaki

Fast GC-FID Based Metabolic Fingerprinting of Japanese Green Tea Leaf for Its Quality Ranking Prediction
K. Jumtee, T. Bamba, and E. Fukusaki

Development of a Method for Comprehensive and Quantitative Analysis of Plant Hormones by Highly Sensitive Nanoflow Liquid Chromatography-electrospray Ionization-ion Trap Mass Spectrometry
Y. Izumi, A. Okazawa, T. Bamba, A. Kobayashi, and E. Fukusaki

A Novel Application of Metabolomics in Vertebrate Development

Comprehensive Metabolite Profiling of *phyA phyB phyC* Triple Mutants to Reveal Their Associated Metabolic Phenotype in Rice Leaves

Molecular Characterization of the Relationships among *Amylomyces rouxii*, *Rhizopus oryzae*, and *Rhizopus delemar*
H. Kito, A. Abe, I-Nengah Sujaya, Y. Oda, K. Asano, and T. Sone

Biotransformation of Daidzein to Equol by Crude Enzyme from *Asaccharobacter celatus* AHU1763 Required an Anaerobic Environment
C. Thawornkuno, M. Tanaka, T. Sone, and K. Asano

Identification and Characterization of *Rhizot*, a Novel LTR Retrotransposon of *Rhizopus oryzae* and *R. delemar*
A. Abe, K. Asano, and T. Sone
Molecular Cloning and Characterization of the AVR-Pia Locus from a Japanese Field Isolate of Magnaporthe oryzae

Molecular Cloning and Expression of a Novel Choline-phosphotransferase Involved in Glycoglycerophospholipid Biosynthesis of Mycoplasma fermentans

Effect of an Additionally Introduced degQ Gene on Di-D-Fructofuranosyl 2,6'-2',6 Anhydride (DFA IV) Production by Recombinant Bacillus subtilis in a Single Culture Production System

Genomic Analysis of the Basal Lineage Fungus Rhizopus oryzae Reveals a Whole-genome Duplication

A Real-time PCR Method Targeting a Gene Sequence Encoding 16S rRNA Processing Protein, rimM, for Detection and Enumeration of Streptococcus thermophilus in Dairy Products

Stable Expression of the Chlorocatechol Dioxygenase Gene from Ralstonia eutropha NH9 in Hybrid Poplar Cells

The Cellulolytic and Hemi-cellulolytic System of Bacillus licheniformis SVD1 and the Evidence for Production of a Large Multi-enzyme Complex

Unusual Binding Properties of the Dockerin Module of Clostridium thermocellum Endoglucanase CelJ (Cel9D-Cel44A)
Functional Insights into the Role of Novel Type I Cohesin and Dockerin Domains from Clostridium thermocellum

The Dock Tag, an Affinity Tool for the Purification of Recombinant Proteins, Based on the Interaction between Dockerin and Cohesin Domains from Clostridium josui Cellulose

Analysis of a New Xylanase Xyn10B from Paenibacillus curdlanolyticus B-6
M. Sudo, M. Sakka, T. Kimura, K. Ratanakhanokchai, and K. Sakka 374

Performance of Hydrogen Fermentation by Using Immobilized Carrier

Heterologous Expression of Bacterial Xylanase in Higher Plant

Enhancement of Enzymatic Hydrolysis of Cellulose by Using Ultrasonic Irradiation

Hydrogen Production from Kitchen Waste by Hydrogen Fermentation
S. Mizuno, N. Osaka, M. Sakka, and K. Sakka 395

Sequence of a Clostridium josui Cellulase Gene Cluster and Characterization of Man5A
M. Sakka, M. Goto, T. Fujino, E. Fujino, S. Karita, and K. Ohmiya 401

Cellulotytic and Hemicellulolytic Activity in Bacillus licheniformis SVD1 and the Presence of a Multi-enzyme Complex

Development of a New Affinity Tag System Derived from Cellulose
Display of Artificial Scaffolding Proteins on Yeast Surface
K. Kohda, K. Tokuhiro, K. Ohno, T. Kitagawa, K. Sakka, and T. Imaeda

Molecular Biochemistry of a Xyloglucanase Ce144A from Clostridium thermocellum Unveiled by X-ray Crystallography
Y. Kitago, S. Karita, N. Watanabe, K. Sakka, and I. Tanaka

Functional Analysis of β-N-acetylglucosaminidase Domains from Clostridium paraputrificum M21
M. Narita, Hauzhong Li, M. Inagaki, M. Sakka, T. Kimura, and K. Sakka

In Vitro Degradation Test of Phenol in Surface, Deep and Mixed Seawater
S. Iwasaki, T. Kimura, M. Sakka, and K. Sakka

Identification of Nobiletin, a Polymethoxyflavonoid, as an Enhancer of Adiponectin Secretion

Synthesis and Evaluation of Myxochelin Analogues as Antimetastatic Agents
S. Miyanaga, H. Sakurai, I. Saiki, H. Onaka, and Y. Igarashi

Brartemicin, an Inhibitor of Tumor Cell Invasion from the Actinomycete Nonomuraea sp.
Y. Igarashi, T. Mogi, S. Yanase, S. Miyanaga, T. Fujita, H. Sakurai, I. Saiki, and A. Ohsaki

Mapping and Identification of the Region and Secondary Structure Required for the Maturation of the Nukacin ISK-1 Prepeptide

Kinetic Modeling and Sensitivity Analysis of Xylose Metabolism in Lactococcus lactis IO-1

ATP-dependent Leader Peptide Cleavage by NukT, a Bifunctional ABC Transporter, during Lantibiotic Biosynthesis
M. Nishie, K. Shioya, J. Nagao, H. Jikuya, and K. Sonomoto
Peptide-lipid Huge Toroidal Pore, a New Antimicrobial Mechanism Mediated by a Lactococcal Bacteriocin, Lacticin Q

Nukacin ISK-1, a Bacteriostatic Lantibiotic

Evaluation of Essential and Variable Residues of Nukacin ISK-1 by NNK Scanning

Effect of a Negatively Charged Lipid on Membrane-lacticin Q Interaction and Resulting Pore Formation
F. Yoneyama, K. Shioya, T. Zendo, J. Nakayama, and K. Sonomoto 503

Identification and Characterization of Novel Multiple Bacteriocins Produced by Leuconostoc pseudomesenteroides QU 15
N. Sawa, K. Okamura, T. Zendo, K. Himeno, J. Nakayama, and K. Sonomoto 507

A Cytosolic Phospholipase A2-like Protein in the Filamentous Fungus Aspergillus oryzae Localizes to the Intramembrane Space of the Mitochondria
K. Takaya, Y. Higuchi, K. Kitamoto, and M. Arioka 517

Endocytic Recycling of the Tip Region in the Filamentous Fungus Aspergillus oryzae
Y. Higuchi, M. Arioka, and K. Kitamoto 526

Heterologous Expression and Characterization of an Endoglucanase from a Symbiotic Protist of the Lower Termite, Reticulitermes speratus

Estrogenic Activity of Diarylheptanoids from Curcuma comosa Roxb. Requires Metabolic Activation
Wipawee Winuthayanon, Kanoknetr Suksen, Chuenchit Boonchird, Aporn Chuncharuee, Mathurose Ponglikitmongkul, Apichart Suksamrarn, and Pawinee Piyachaturawat 539
Genome-wide Identification of Genes Involved in Tolerance to Various Environmental Stresses in Saccharomyces cerevisiae
C. Auesukaree, A. Damnernsawad, M. Kruatrachue, P. Pokethitiyook, C. Boonchird, Y. Kaneko, and S. Harashima 545

Millerozyma phetchabunensis sp. nov. a Novel Ascomycetous Yeast Species Isolated from Nam Nao Forest Soil in Thailand, and the Transfer of Pichia koratensis to the Genus Millerozyma
Somsak Tammawong, S. Ninomiya, H. Kawasaki, Chuenchit Boonchird, and Tawatchai Sumpradit 555

Differential Binding with Erα and ERβ of the Phytoestrogen-rich Plant Pueraria mirifica
C. Boonchird, T. Mahapanichkul, and W. Cherdshewasart 561

Aspergillusol A, an α-Glucosidase Inhibitor from the Marine-derived Fungus Aspergillus aculeatus
Nattha Ingavat, J. Dobereiner, Suthep Wiyakruna, Chulabhorn Mahidol, Somsak Ruchirawat, and Prasat Kittakoop 567

A Simple, Sensitive and Green Dienzymatic UV-spectrophotometric Assay of Amoxicillin Formulations
Theerasak Rojanarata, Praneet Opanasopit, Tanasait Ngawhirunpat, Choedchai Saehuan, Suthep Wiyakrutta, and Vithaya Meevootisom 583

Wickerhamomyces edaphicus sp. nov. and Pichia jaroonii sp. nov., Two Ascomycetous Yeast Species Isolated from Forest Soil in Thailand
Savitree Limtong, Wichien Yongmanitchai, H. Kawasaki, and K. Fujiyama 588

Candida siamensis sp. nov., an Anamorphic Yeast Species in the Saturnispora Clade Isolated in Thailand
Chanita Boonmak, Sasitorn Jindamorakot, H. Kawasaki, Wichien Yongmanitchai, Poopilai Suwanarit, T. Nakase, and Savitree Limtong 595

Three Anamorphic Yeast Species Candida sanitii sp. nov., Candida sekii sp. nov., and Candida suwanaritii, Three Yeasts in the Saturnispora Clade Isolated in Thailand
Savitree Limtong, Rungluk Kaewwichian, Somjit Am-In, Chanita Boonmak, Sasitorn Jindamorakot, Wichien Yongmanitchai, Natana Srisuk, H. Kawasaki, and T. Nakase 600
Geotrichum siamensis sp. nov. and Geotrichum phurueaensis sp. nov., Two Asexual Arthroconidial Yeast Species Isolated in Thailand
Rungluk Kaewwichian, Wichien Yongmanitchai, Nantana Srisuk, K. Fujiyama, and Savitree Limtong 609

Substrate-binding Site of Family 11 Xylanase from Bacillus firmus K-1 by Molecular Docking
Pattraporn Jommuengbout, Surapong Pinitglang, Khin Lay Kyu, and Khanok Ratanakhanokchai 616

Isolation and Characterization of a Multienzyme Complex (Cellulosome) of the Paenibacillus curdlanolyticus B-6 Grown on Avicel under Aerobic Conditions
Rattiya Waeonukul, Khin Lay Kyu, K. Sakka, and Khanok Ratanakhanokchai 623

An Efficient Treatment for Detoxification Process of Cassava Starch by Plant Cell Wall-degrading Enzymes
Somphit Sornyotha, Khin Lay Kyu, and Khanok Ratanakhanokchai 628

PUBLICATIONS by Former Participants in UNESCO International Post-Graduate University Course in Microbiology and UNESCO Postgraduate Inter-University Course in Biotechnology

Alcoholic Fermentation of Xylose and Mixed Sugars Using Recombinant Saccharomyces cerevisiae Engineered for Xylose Utilization
A. Madhavan, S. Tamalampudi, A. Srivastava, H. Fukuda, V. S. Bisaria, and A. Kondo 635

Xylose Isomerase from Polycentric Fungus Orpinomyces: Gene Sequencing, Cloning, and Expression in Saccharomyces cerevisiae for Bioconversion of Xylose to Ethanol
A. Madhavan, S. Tamalampudi, K. Ushida, D. Kanai, S. Katahira, A. Srivastava, H. Fukuda, V. S. Bisaria, and A. Kondo 646

Genetic Algorithm-based Medium Optimization for Enhanced Production of Fluorescent Pseudomonad R81 and Siderophore M.V. R. K. Sarma, V. Sahai, and V. S. Bisaria 647

Enhanced Production of Podophyllotoxins by Co-culture of Transformed Linum album Cells with Plant Growth-promoting Fungi
A. Baldi, S. Farkya, A. Jain, N. Gupta, R. Mehra, V. Datta, A. K. Srivastava, and V. S. Bisaria 648
Pigments and Anti-cholesterol Agent Production by Monascus kaoliang KB9 and Its Color Mutants in Rice Solid Cultures
Jirawan Chayawat, Saeree Jareonkitmongkol, Apisit Songsasen, and Busaba Yongsmith

Lipid Profile in Thyroid Disorders and the Risk of Atherosclerotic Cardiovascular Diseases in the Middle-aged Population of Bangladesh

Serum Zinc Level Is Inversely Related with Hyperglycemia in Type 2 Diabetes Mellitus

Kingfish (Scomberomorus commerson) Oil Ameliorates Lipid Profile and Anti-oxidative Status in Hypercholesterolemic Rats
B. A. Al-Riyami, N. Masum, H. M. Shahjalal, M. S. Hossain, N. Guizani, and Ishtiaq Mahmud

Pomegranate (Punica granatum) Seed Linolenic Acid Isomers: Concentration-dependent Modulation of Estrogen Receptor Activity
H. Ngoc Al Tran, Soo-Young Bae, Bang-Ho Song, Bang-Hyo Lee, Young-Seok Bae, Young-Ho Kim, Ephraim Philip Lansky, and Robert A. Newman

Congo Red Decolorizing Activity under Microcosm and Decolorization of Other Dyes by Congo Red Decolorizing Bacteria

Extreme Sensitivity of Botulinum Neurotoxin Domains towards Mild Agitation
S. I. Toth, L. A. Smith, and S. A. Ahmed

Rapid Product Analysis and Increased Sensitivity for Quantitative Determinations of Botulinum Neurotoxin Proteolytic Activity
B. Rowe, J. J. Schmidt, L. A. Smith, and S. A. Ahmed

L-Asparaginase Production by Actinomycetes Isolated from Some Thai Medicinal Plant Rhizosphere Soils
Sutthinan Khamna, A. Yokota, and Saisamorn Lumyong
Identification of a Novel Compound That Inhibits iNOS and COX-2 Expression in LPS-stimulated Macrophages from *Schisandra chinensis*
You Jin Lee, Sun Young Park, Sun Gun Kim, Da Jung Park, Jum Soon Kang, Sang Joon Lee, Sik Yoon, Young Hun Kim, Yoe-Sik Bae, and Young-Whan Choi

1,3-Dichloro-2-propanol Induces Apoptosis via Both Calcium and ROS in Mouse Melanoma Cells
Sun Young Park, Young Hun Kim, Young Hee Kim, and Sang-Joon Lee

Antifungal Activity of CHE-23C, a Dimeric Sesquiterpene from *Chloranthus henryi*
Yun Mi Lee, Jae Sun Moon, Bong-Sik Yun, Ki Duk Park, Gyung Ja Choi, Jin-Cheol Kim, Sang Han Lee, and Sung Uk Kim

Meat Species Identification Based on the Loop Mediated Isothermal Amplification and Electrochemical DNA Sensor

Characterization of Biosurfactant from *Saccharomyces cerevisiae* 2031 and Evaluation of Emulsification Activity for Potential Application in Bioremediation

Performance Evaluation of a New Rapid Urine Test for Chlamydia in Men: Prospective Cohort Study

Pitfalls of Internet-accessible Diagnostic Tests: Inadequate Performance of a CE-marked Chlamydia Test for Home Use
C-E. C. Michel, F. G. Saison, H. Joshi, L. M. M. Tapay, and H. H. Lee

Survey of Egg- and Cyst-parasitic Fungi of Potato Cyst Nematode in Indonesia
S. Indarti, D. Widianto, Young Ho Kim, Mulyadi, and Suryanti
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production and Characterization of Anti-dengue Capsid Antibodies Suggesting the N Terminus Region Covering the First 20 Amino Acids of Dengue Virus Capsid Protein Is Predominantly Immunogenic in Mice</td>
<td>Chunya Puttikhunt, Prapapun Ong-ajchaowierd, Tanapan Prommool, Sutha Sangiambut, Janjuree Netsawang, Thawornchai Limjindaporn, Prida Malasit, and Watchara Kasinrerk</td>
<td>746</td>
</tr>
<tr>
<td>Nuclear Localization of Dengue Virus Capsid Protein Is Required for DAXX Interaction and Apoptosis</td>
<td>Janjuree Netsawang, Sansanee Noisakran, Chunya Puttikhunt, Watchara Kasinrerk, Wiyada Wongwiwat, Prida Malasit, Pa-thai Yenchitsomanus, and Thawornchai Limjindaporn</td>
<td>757</td>
</tr>
<tr>
<td>Purification, Characterization and Biochemical Properties of ( \alpha )-Amylase from Potato (Solamum tuberosum)</td>
<td>G. K. Sarker, S. Hasan, F. Nikkon, A. Mosaddik, N. K. Sana, Habibur Rahman, Sanggyu Park, Dong-Sun Lee, and Somi Kim Cho</td>
<td>758</td>
</tr>
<tr>
<td>Proximate Analysis and Physico-chemical Properties of Flour from the Seeds of the China Chestnut, Sterculia monosperma Ventenat</td>
<td>S. Noitang, Sarintip A. Sooksai, T. Foophow, and A. Petsom</td>
<td>765</td>
</tr>
<tr>
<td>Highly Thermostable L-threonine Dehydrogenase from the Hyperthermophilic Archaeon Thermococcus kodakaraensis</td>
<td>Q. Bashir, N. Rashid, F. Jamil, T. Imanaka, and M. Akhtar</td>
<td>771</td>
</tr>
<tr>
<td>Gene Cloning and Characterization of a Xylanase from a Newly Isolated Bacillus subtilis Strain R5</td>
<td>A. Jalal, N. Rashid, N. Rasool, and M. Akhtar</td>
<td>779</td>
</tr>
<tr>
<td>Insoluble but Enzymatically Active ( \alpha )-amylase from Bacillus licheniformis</td>
<td>N. Rashid, A. Farooq, I. Haq, and M. Akhtar</td>
<td>782</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Exopolysaccharide Production and Its Bioactivities of the Edible <em>Pleorotus ostreatus</em> in Submerged Culture</td>
<td>783</td>
<td></td>
</tr>
<tr>
<td>I. Saskiawan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polycyclic Aromatic Hydrocarbons Degradation by <em>Agrocybe</em> sp. CU-43 and Its Fluorene Transformation</td>
<td>792</td>
<td></td>
</tr>
<tr>
<td>Kunlanee Chupungars, Panan Rerngsamran, and Suthep Thaniyavarn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNA Damage-induced Phosphorylation of TRF2 Is Required for the Fast Pathway of DNA Double-strand Break Repair</td>
<td>799</td>
<td></td>
</tr>
<tr>
<td>N. Huda, H. Tanaka, M. S. Mendonca, and D. Gilley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodegradation of Aniline by a Newly Isolated <em>Delftia</em> sp. XYJ6</td>
<td>807</td>
<td></td>
</tr>
<tr>
<td>Xiao Chengbin, King Jun, Yan Hai, Sun Xudong, and Hu Jiye</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Surface Engineering of a β-galactosidase for Galactooligosaccharide Synthesis</td>
<td>813</td>
<td></td>
</tr>
<tr>
<td>Yumei Li, Lili Lu, Hongmei Wang, Xiaodong Xu, and Min Xiao</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purification and Characterization of a Novel β-galactosidase with Transglycosylation Activity from <em>Bacillus megaterium</em> 2-37-4-1</td>
<td>818</td>
<td></td>
</tr>
<tr>
<td>Yumei Li, Hongmei Wang, Lili Lu, Zhengyi Li, Xiaodong Xu, and Min Xiao</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalytic Removal of Sulfide by an Immobilized Sulfide-oxidase Bioreactor</td>
<td>819</td>
<td></td>
</tr>
<tr>
<td>Chun-Ming Zhang, Xing-She Luan, Min Xiao, Jian Song, Lili Lu, and Xiao Xiao</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A Novel Transglycosylating β-galactosidase from <em>Enterobacter cloacae</em> B5</td>
<td>820</td>
<td></td>
</tr>
<tr>
<td>Li-Li Lu, Min Xiao, Zheng-yi Li, Yu-mei Li, and Feng-shan Wang</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characterization of 1-aminocyclopropane-1-carboxylate Deaminase Producing Methylobacteria from Phyllosphere of Rice and Their Role in Ethylene Regulation</td>
<td>821</td>
<td></td>
</tr>
<tr>
<td>C. Chinnadurai, D. Balachandar, and S. P. Sundaram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrichment of Bacteria Possessing Catechol Dioxygenase Genes in the Rhizosphere of <em>Spirodela polyrrhiza</em>: A Mechanism of Accelerated Biodegradation of Phenol</td>
<td>830</td>
<td></td>
</tr>
<tr>
<td>T. Toyama, K. Sei, Ning Yu, H. Kumada, D. Inoue, Hai Hoang, S. Soda, Young-Cheol Chang, S. Kikuchi, M. Fujita, and M. Ike</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characterization of Novel 4-n-butylphenol-degrading <em>Pseudomonas</em> verontii Strains Isolated from Rhizosphere of Giant Duckweed, <em>Spirodela polyrrhiza</em></td>
<td>842</td>
<td></td>
</tr>
<tr>
<td>Hoang Hai, D. Inoue, N. Momotani, Ning Yu, T. Toyama, K. Sei, and M. Ike</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Biodegradation of Nonylphenol by *Spirodela polyrrhiza-* rhizobacterial Association and Characterization of Nonylphenol-degrading Bacteria Isolated from the Rhizosphere
*M. Ike, D. Inoue, T. Toyama, Y. Matsunaga, N. Momotani, Hoang Hai, K. Sei, and S. Soda*

Differential Expression Patterns and Developmental Roles of Duplicated Scinderin-like Genes in Zebrafish
*Sujuan Jia, N. Nakaya, and J. Piatigorsky*

Concentration Dependent Growth/Non-growth Linked Kinetics of Endosulfan Biodegradation by *Psudomonas aeruginosa*
*S. Hussain, M. Arshad, B. Shaharoona, M. Saleem and A. Khalid*

Impact of Pesticides on Soil Microbial Diversity, Enzymes, and Biochemical Reactions
*S. Hussain, T. Siddique, M. Saleem, M. Arshad, and A. Khalid*

Growth and Yield Response of Tomato (*Lycopersicon esculentum MILL.*) to Soil Applied Calcium Carbide and L-methionine
*S. Siddiq, M. Yaseen, S. A. R. Mehdi, A. Khalid, and S. Kashif*

Biodegradation Potential of Pure and Mixed Bacterial Cultures for Removal of 4-nitroaniline from Textile Dye Wastewater
*A. Khalid, M. Arshad, and D. E. Crowley*

*Gluconobacter kanchanaburiensis* sp. nov., a Brown Pigment-producing Acetic Acid Bacterium for Thai Isolates in the Alphaproteobacteria
*Taweesak Malimas, Pattaraporn Yukphan, Tserennyam Lundaa, Y. Muramatsu, M. Takahashi, M. Kanayasu, Wanchern Potacharoen, Somboon Tanasupawat, Y. Nakagawa, K. Suzuki, Morakot Tanticharoen, and Y. Yamada*

*Gluconobacter wancherniae* sp. nov., an Acetic Acid Bacterium from Thai Isolates in the α-Proteobacteria
*Pattaraporn Yukphan, Taweesak Malimas, Tserennyam Lunda, Y. Muramatsu, M. Takahashi, M. Kaneyasu, Somboon Tanasupawat, Y. Nakagawa, K. Suzuki, Morakot Tanticharoen, and Y. Yamada*

Molecular Characterization and Isolation of Cytochrome P450 Genes from the Filamentous Fungus *Aspergillus oryzae*
*K. H. M. Nazmul Hussain Nazir, H. Ichinose, and H. Wariishi*
Genetic Variability of Heat Tolerance, and Its Effect on Yield and Fibre Quality Traits in Upland Cotton (Gossypium hirsutum L.)

Cloning of the RNase H Genes from a Metagenomic DNA Library: Identification of a New Type I RNase H without a Typical Active-site Motif

REPORT BY Cooperative Researchers for JSPS Asian Core Program: Next-Generation Bioproduction Platform Leveraging Subtropical Microbial Bioresources

Identification and Characterization of Genes Involved in the Growth of Wild Yeast at High Temperature
Pornpon Sanpanyawai, Thipa Asvarak, M. Sugiyama, Y. Kaneko, S. Harashima, and Chuenchit Boonchird 901

Molecular Diversity and Construction of a Lignocellulose Degrading Microbial Consortium for Biotechnological Conversion of Local Agricultural Biomass
Sarunyou Wongwilaiwarin, Ukrit Rattanachomsri, Thanaporn Laothanachareon, Verawat Champreda, and Y. Igarashi 902

Interesting and New Recorded Aquatic Litter Fungi in Ba Be and Bach Ma National Parks, Viet Nam
Le Thi Hoang Yen, K. Ando, S. Inaba, Y. Tsurumi, Duong Van Hop, and Nguyen Lan Dung 913

REPORT of Recent Research by Former Participant in UNESCO International Post-Graduate University Course in Microbiology

The Production of Coconut Oil from Coconut Milk by Fermentation
Ukan Sukandar 925

Activities of International Center for Biotechnology for 2009 935

Index 959
Author Index 961
Subject Index 967