

# Phycological Research

Volume 59 • Issue 2 • April 2011

ISSN 1322-0829



  
WILEY-  
BLACKWELL

The Japanese  
Society of  
Phycology



# Phycological Research

## EDITOR-IN-CHIEF

Ichiro Mine

Graduate School of Kuroshio Science, Kochi University, Japan

## ASSOCIATE EDITORS

Olivier De Clerck  
Biology Department,  
Ghent University,  
Belgium

Daisuke Honda  
Department of Biology,  
Faculty of Science and  
Engineering, Konan  
University, Japan

Mona Hoppenrath  
Senckenberg Research  
Institute, German  
Centre for Marine  
Biodiversity Research,  
Germany

Matthew L. Julius  
Department of Biological  
Sciences, St. Cloud  
State University, USA

Mitsunobu Kamiya  
Department of Marine  
Bioscience, Faculty of  
Biotechnology, Fukui  
Prefectural University,  
Japan

Ulf Karsten  
Institute of Biological  
Sciences, University of  
Rostock, Germany

Christos Katsaros  
Department of Botany,  
Faculty of Biology,  
University of Athens,  
Greece

Masanobu Kawachi  
Environmental Biology  
Division, National  
Institute for  
Environmental Studies,  
Japan

Gwang Hoon Kim  
Department of Biology,  
Kongju National  
University, Korea

Jeong Ha Kim  
Department of  
Biological Sciences,  
Sungkyunkwan  
University, Korea

Show-Mei Lin  
Institute of Marine  
Biology, National  
Taiwan Ocean  
University, Taiwan

Shigeki Mayama  
Department of Biology,  
Tokyo Gakugei  
University, Japan

Hideaki Miyashita  
Department of  
Interdisciplinary  
Environment, Graduate  
School of Human and  
Environmental Studies,  
Kyoto University, Japan

Taizo Motomura  
Field Science Center for  
Northern Biosphere,  
Hokkaido University,  
Japan

Wendy Nelson  
National Centre of  
Aquatic Biodiversity  
and Biosecurity,  
New Zealand

Hiroyuki Sekimoto  
Department of Chemical  
and Biological Sciences,  
Faculty of Science,  
Japan Women's  
University, Japan

John West  
School of Botany,  
University of  
Melbourne, Australia

Giuseppe C. Zuccarello  
School of Biological  
Sciences, Victoria  
University of Wellington,  
New Zealand

This journal is available online at *Wiley Online Library*. Visit [wileyonlinelibrary.com](http://wileyonlinelibrary.com) to search the articles and register for table of contents email alerts.

Access to this journal is available free online within institutions in the developing world through the AGORA initiative with the FAO, and the OARE initiative with UEP. For information, visit <http://www.aginternetwork.org>, [www.oarescience.org](http://www.oarescience.org).

**AIMS AND SCOPE** *Phycological Research* is published by the Japanese Society of Phycology and complements the *Japanese Journal of Phycology*. The Journal publishes international, peer-reviewed research dealing with all aspects of phycology to facilitate the international exchange of results. All articles are peer-reviewed by at least two researchers expert in the field of the submitted paper. *Phycological Research* has been credited by the International Association for Plant Taxonomy for the purpose of registration of new non-vascular plant names (including fossils). For further information see <http://bgbm3.bgbm.fu-berlin.de/iapt/registration/journals/htm>.

**ABSTRACTING AND INDEXING SERVICES** This journal is indexed by Aquatic Sciences & Fisheries Abstracts, BIOBASE, Biological Abstracts, BIOSIS Previews, Biotechnology & Bioengineering Abstracts, Cambridge Scientific Abstracts, Chemical Abstracts Service, Current Awareness in Biological Sciences, Current Contents, Ecological Abstracts, EMBASE/Excerpta Medica, Environmental Sciences and Pollution Management, GEOBASE, Irrigation and Drainage Abstracts, Microbiology Abstracts, Oceanic Abstracts, Pollution Abstracts, ProQuest (previously University Microfilms), Referativnyi Zhurnal, Science Citation Index (ISI), Soils and Fertilizers, Weed Abstracts, Zoological Record, National Inquiry Services Centre (NISC).

**THE JAPANESE SOCIETY OF PHYCOLOGY** We invite anyone who is interested in any aspect of phycology to become a member of the Society. As a member you will receive *Phycological Research* and the *Japanese Journal of Phycology* free of charge. The annual membership fee for individuals ¥8000. Members who reside outside Japan will receive only the English language journal *Phycological Research* and the annual membership fee is ¥7000 (standard), ¥5000 (student).

Those who wish to join the Society should send the application form (at the back of each issue of the Journal), together with payment, to the Membership Secretary, Dr Chikako Nagasato, at the address given on the form. Members who wish to claim for missing or damaged issues should contact the Membership Secretary.

**ADDRESS FOR EDITORIAL CORRESPONDENCE** Ichiro Mine, Graduate School of Kuroshio Science, Kochi University, 2-5-1 Akebono-cho, Kochi, Kochi 780-8520, Japan (E-mail: [mine@kochi-u.ac.jp](mailto:mine@kochi-u.ac.jp)).

**DISCLAIMER** The Publisher, Society and Editors cannot be held responsible for errors or any consequences arising from the use of information contained in this journal; the views and opinions expressed do not necessarily reflect those of the Publisher, Society and Editors, neither does the publication of advertisements constitute any endorsement by the Publisher, Society and Editors of the products advertised.

Copyright © 2011 Japanese Society of Phycology.

Cover Pneumatophores of *Avicennia germinans* from El Tamarindo, El Salvador covered with the "Bostrychietum". The Bostrychietum is an algal community associated with mangroves and contains the genus *Bostrychia*. These pneumatophores are covered with *Bostrychia radicans*/B. *mortiziana*, and other algal species.

## Note to NIH Grantees

Pursuant to NIH mandate, Wiley-Blackwell will post the accepted version of contributions authored by NIH grant-holders to PubMed Central upon acceptance. This accepted version will be made publicly available 12 months after publication. For further information, see [www.wiley.com/go/nihmandate](http://www.wiley.com/go/nihmandate).

For submission instructions, subscription and all other information visit <http://wileyonlinelibrary.com/journal/pre>

ISSN 1322-0829 (Print) ISSN 1440-1835 (online)

# The Japanese Society of Phycology

## Officers for 2011-2012

President: Takeo Horiguchi *Hokkaido University, Japan*  
Secretary: Kazuhiro Kogame *Hokkaido University, Japan*  
Treasurer: Tsuyoshi Abe *Hokkaido University, Japan*  
Membership Secretary: Chikako Nagasato *Hokkaido*

*University, Japan*; Shinya Yoshikawa *Fukui Prefectural University, Japan*  
Public Relations Secretary: Yukimasa Yamagishi *Fukuyama University, Japan*  
Secretary for International Affairs: Shinya Uwai *Niigata University, Japan*

## Members of Executive Council 2011-2012

Put O. Ang Jr. *The Chinese University of Hong Kong, China*  
Alan T. Critchley *Acadian Seaplants Limited, Canada*  
Shinji Handa *Hiroshima Environment & Health Association, Japan*  
Isao Inouye *University of Tsukuba, Japan*  
Mitsunobu Kamiya *Fukui Prefectural University, Japan*  
Shigeo Kawaguchi *Kyushu University, Japan*  
Hiroshi Kawai *Kobe University, Japan*  
Taiju Kitayama *National Museum of Nature and Science, Japan*

Shinichi Miyamura *University of Tsukuba, Japan*  
Taizo Motomura *Hokkaido University, Japan*  
Noboru Murase *National Fisheries University, Japan*  
Takashi Nakada *Keio University, Japan*  
Yukihiko Serisawa *University of Yamanashi, Japan*  
Satoshi Shimada *Ochanomizu University, Japan*  
Jiro Tanaka *Tokyo University of Marine Science and Technology, Japan*  
Ryuta Terada *Kagoshima University, Japan*  
Hajime Yasui *Hokkaido University, Japan*  
Ikuo Yoshinaga *Kyoto University, Japan*

## JOIN THE JAPANESE SOCIETY OF PHYCOLOGY AND RECEIVE FOUR ISSUES OF PHYCOLOGICAL RESEARCH PER YEAR FREE OF CHARGE

The Japanese Society of Phycology, founded in 1952, currently has 760 members (including 105 overseas members). The Society is open to anyone who is interested in pure or applied aspects of phycology.

### Application for membership

(Please type or write in block letters)

Membership starts from 2011

Name in full: \_\_\_\_\_  
(Family name) (Given name and initials)

Mailing address: \_\_\_\_\_

\_\_\_\_\_  
(Postal code) (Country)

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_ Interests: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**The annual fee for individual members is ¥8000**

**(¥7000 for members who reside outside Japan, ¥5000 for students who submit a verifying statement signed by their Chairperson or Head of Department)**

Payment by: ☐ Visa ☐ MasterCard ☐ American Express

Card number: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Expiry date: \_\_\_\_\_

Signature: \_\_\_\_\_

☐ International giro postal transfer (Postal Account No.: 01320-4-48748)

☐ International postal money order

Send application form to: Dr Chikako Nagasato

Muroran Marine Station

Field Science Center for Northern Biosphere

Hokkaido University

Muroran 051-0003, Japan

Fax: +81-143-22-4135

Email: [jsp@wwwsoc.nii.ac.jp](mailto:jsp@wwwsoc.nii.ac.jp)



# Phycological Research

Volume 59 • Issue 2 • April 2011

Rosa Trobajo, Laia Rovira, David G. Mann and Eileen J. Cox <i>Effects of salinity on growth and on valve morphology of five estuarine diatoms</i>	83
Frederik Leliaert, Sofie D'hondt, Lennert Tyberghein, Heroen Verbruggen and Olivier De Clerck <i>Atypical development of Chaetomorpha antennina in culture (Cladophorales, Chlorophyta)</i>	91
Giuseppe C. Zuccarello, Joe Buchanan, John A. West and Francisco F. Pedroche <i>Genetic diversity of the mangrove-associated alga Bostrychia radicans/Bostrychia moritziana (Ceramiales, Rhodophyta) from southern Central America</i>	98
Dag Klaveness and Eli-Anne Lindstrøm <i>Hydrurus foetidus (Chromista, Chrysophyceae): A large freshwater chromophyte alga in laboratory culture</i>	105
Arisa Miyagawa-Yamaguchi, Takuma Okami, Nozomu Kira, Haruo Yamaguchi, Kouhei Ohnishi and Masao Adachi <i>Stable nuclear transformation of the diatom Chaetoceros sp.</i>	113
Ken-ichiro Ishida, Hiroko Endo and Sayaka Koike <i>Research note: Partenskyella glossopodia (Chlorarachniophyceae) possesses a nucleomorph genome of approximately 1 Mbp</i>	120
Petr Znachor, Jiří Nedoma and Pavel Rychtecký <i>Research note: Kinetics of glucose stimulatory effect on silica deposition and growth of natural populations of Fragilaria crotonensis</i>	123
Jeffrey D. Leblond, Hermina Ilea Timofte, Shannon A. Roche and Nicole M. Porter <i>Sterols of Glaucocystophytes</i>	129