# Phycological Research

Formerly The Japanese Journal of Phycology

Volume 43 • Issue 2 • June 1995

ISSN 1322-0829







Blackwell Science

The Japanese Society of Phycology

## Phycological Research

#### EDITOR-IN-CHIEF

Hiroshi Kawai Kobe University Research Center for Inland Seas Rokkodai Kobe 657, Japan

#### ASSOCIATE EDITORS

Takeo Horiguchi Graduate School of Science Hokkaido University Japan

Sandra C. Lindstrom
Department of Botany
University of British Columbia
Canada

#### EDITORIAL ADVISORY BOARD

Robert A. Andersen *Maine, USA* Sung-Min Boo *Daejon, Korea* Eric C. Henry *Oregon, USA* Shuji Hino *Yamagata, Japan* Terumitsu Hori *Tsukuba, Japan*  Robert J. King School of Biological Sciences University of New South Wales Australia

Taizo Motomura Institute of Algological Research Hokkaido University Japan

Terunobu Ichimura *Muroran, Japan* Michio Masuda *Sapporo, Japan* Shigeki Mayama *Tokyo, Japan* Hiroyuki Nakahara *Kyoto, Japan* Masao Ohno *Kochi, Japan* 

In Kyu Lee Department of Botany Seoul National University Korea

Makoto M. Watanabe National Institute for Environmental Studies Japan

Ikuko Shihira-Ishikawa *Tokyo, Japan* Mikio Tsuzuki *Tokyo, Japan* Shin Watanabe *Toyama, Japan* John A. West *Melbourne, Australia* 

**AIMS AND SCOPE** Phycological Research is published by The Japanese Society of Phycology and complements *The Japanese Journal of Phycology*. The journal publishes international research dealing with all aspects of phycology to facilitate the international exchange of results.

Publication of *Phycological Research* has been supported in part by a Grant-in-Aid for Publication of Scientific Result from the Ministry of Education, Science and Culture, Japan.

**EDITORIAL CORRESPONDENCE** Papers and other material for publication should be sent to the Editor-in-Chief: Dr Hiroshi Kawai, Kobe University Research Center for Inland Seas, Rokkodai, Kobe 657, Japan (fax: +81 78 803 0488. e-mail: kawai@gradura.scitec.kobe-u.ac.jp). For details concerning the submission of papers to the Journal see the Notice to Contributors at the back of the Journal.

**BUSINESS CORRESPONDENCE** All matters relating to orders and subscriptions, back numbers and offprints should be sent to Blackwell Science Pty Ltd, at 54 University Street, Carlton, Victoria 3053, Australia (telephone +613 9347 0300, facsimile +613 9347 5001).

**SUBSCRIPTION RATES** The Journal is published quarterly and the subscription prices for 1995 are US\$170.00/¥17,000.00. The Journal is dispatched to subscribers by surface air-lifted post.

**ADVERTISEMENT BOOKINGS** Enquiries should be sent to the Advertisement Manager, Blackwell Science Pty Ltd, 54 University Street, Carlton, Victoria 3053, Australia (telephone +613 9347 0300, facsimile +613 9347 5001). Although all accepted advertising material is expected to conform to ethical standards, such acceptance is not implied by the Journal.

THE JAPANESE SOCIETY OF PHYCOLOGY We invite anyone who is interested in any aspect of phycology to become a member of The Japanese Society of Phycology. As a member, you will receive *Phycological Research* free of charge. The annual membership fee for individuals is ¥7,000. Those who wish to join the Society should send the application form (at back of the Journal) together with payment to the Membership Secretary: Dr Taiju Kitayama, Division of Cryptogams, National Science Museum, Hyakunincho 3-23-1, Shinjuku, Tokyo 169 Japan (fax: +81 33 364 7104).

COPYRIGHT AND PHOTOCOPYING © 1995 Blackwell Science Pty Ltd. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Blackwell Science Pty Ltd for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$10.50 per copy is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923, USA. This consent does not extend to other kinds of copying, such as copying for general distribution for advertising or promotional purposes, for creating new collective works or for resale. Special requests should be addressed to the Publisher. 1322-0829/95 \$10.50

**Cover** Scanning electron micrographs of *Amphidiniella sedentaria* Horiguchi, a new sand-dwelling dinoflagellate from Japan. The cell consists of a small epitheca and a large hypotheca superficially resembling the unarmored genus *Amphidinium*. Left: Latero-ventral view of the cell. Top right: Apical view. Bottom right: Close-up of the epitheca (ventral view). (See pp. 93–99 for details).

### Phycological Research

(Formerly The Japanese Journal of Phycology)

Phycological Research is published by The Japanese Society of Phycology and complements *The Japanese Journal of Phycology*, one of the oldest phycological journals in existence. The purpose of *Phycological Research* is to facilitate the international exchange of phycological information by publishing international research dealing with all aspects of phycology.

Officers for 1995–1996

President: Tadao Yoshida, Division of Biological Sciences, Graduate School of Science, Hokkaido University, Sapporo 060, Japan

Secretary: Takeo Horiguchi, Division of Biological Sciences, Graduate School of Science, Hokkaido University, Sapporo 060, Japan

Membership Secretary: Taiju Kitayama, Division of Cryptogams, National Science Museum, Hyakunincho, Shinjuku, Tokyo 169, Japan Treasurer: Kazuhiro Kogame, Division of Biological Sciences, Graduate School of Science, Hokkaido University, Sapporo 060, Japan

Editor, *Phycological Research*: Hiroshi Kawai, Department of Biology, Faculty of Science, Kobe University, Rokkodai, Kobe 657, Japan

Editor, *The Japanese Journal of Phycology* 'Sorui': Isao Inouye, Institute of Biological Sciences, University of Tsukuba, Tsukuba 305, Japan

#### Members of Executive Council 1995-1996

Yuji Fujita Nagasaki University
Yoshiaki Hara University of Tsukuba
Hiroshi Kawai Kobe University
Shigeru Kumano
Michio Masuda Hokkaido University
Taketo Nakano Hiroshima University
Hisayoshi Nozaki National Institute for Environmental Studies
Megumi Okazaki Tokyo Gakugei University
Kazuo Okuda Kochi University

Takeo Okuda Yoshiaki Sanbonsuga *Tohoku National Fisheries Research Institute* Jiro Tanaka *Tokyo University of Fisheries* Makoto M. Watanabe *National Institute for Environmental Studies* Shin Watanabe *Toyama University* Hirotoshi Yamamoto *Hokkaido University* 

Yasutsugu Yokohama University of Tsukuba

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

··········	,		
(Please type or write in bloc		r membership	Membership starts from 1995
Name in full: (Family name)	-	(Given name and initials)	
Mailing address:			
		(Postal code)	(Country)
Telephone:		Fax:	
Email:		Interests:	
Signature:		Date:	
	The annual fee for indivi	dual members is ¥7,00	00
Payment by:	☐ Visa ☐ MasterCard	☐ American Express	
Card number:	Expiry	/ date:	
Signature:			
☐ International postal money	transfer (Postal account No.: 0018 ey order		
Send application form to:	Dr Taiju Kitayama	National Science Museum,	

Division of Cryptogams, National Science Museum, Hyakunincho 3-23-1, Shinjuku, Tokyo 169, Japan Fax: +81 33 364 7104

# Phycological Research

Formerly The Japanese Journal of Phycology		
Volume 43 • Issue 2 • June 1995		
Mariana C. Oliveira, Joelius Kurniawan, Carolyn J. Bird, Ellen L. Rice, Colleen A. Murphy, Rama K. Singh, Robin R. Gutell and Mark A. Ragan  A preliminary investigation of the order Bangiales (Bangiophycidae, Rhodophyta) based on		
sequences of nuclear small-subunit ribosomal RNA genes		71
Mitsunobu Kamiya, Jiro Tanaka and Yoshiaki Hara  A morphological study and hybridization analysis of Caloglossa leprieurii (Ceramiales, Rhodophyta) from Japan, Singapore and Australia		81
Takeo Horiguchi Amphidiniella sedentaria gen. et sp. nov. (Dinophyceae), a new sand-dwelling dinoflagellate from Japan		93
Shinichi Miyamura and Terumitsu Hori  Further confirmation of the presence of DNA in the pyrenoid core of the siphonous green algal genus Caulerpa (Caulerpales, Ulvophyceae, Chlorophyta)		101
Kyoko Hatano and Keizo Maruyama  Growth pattern of isolated zoospores in Hydrodictyon reticulatum (Chlorococcales, Chlorophyceae)		105
Makoto M. Watanabe and Tomohiro Sawaguchi  Cryopreservation of a water-bloom forming cyanobacterium, Microcystis aeruginosa f. aeruginosa		111
Nobuyoshi Nanba, Minori Machii, Lim Boon Keng and Nobuo Sakurai  Studies on inoculation of aerial algae. I. Semi-mass culture and quantification of algal color of Klebsormidium flaccidum (Ulotrichales, Chlorophyceae) sprayed on to concrete board		117
Nobuyoshi Nanba  Research note: Egg release and germling development in Sargassum horneri (Fucales, Phaeophyceae)	· .	121





1322-0829(199506)43:2;1-X