

# Paleobiology

(ISSN 0094-8373)

Volume 32

Number 4

Fall, 2006

## CONTENTS

### Articles

- The ark was full! Constant to declining Cenozoic shallow marine biodiversity on an isolated midlatitude continent  
**James S. Crampton, Michael Foote, Alan G. Beu, Phillip A. Maxwell, Roger A. Cooper, Iain Matcham, Bruce A. Marshall, and Craig M. Jones** 509
- Ecological, taxonomic, and taphonomic components of the post-Paleozoic increase in sample-level species diversity of marine benthos  
**Michał Kowalewski, Wolfgang Kiessling, Martin Aberhan, Franz T. Fürsich, Daniele Scarponi, Susan L. Barbour Wood, and Alan P. Hoffmeister** 533
- Inferring natural selection in a fossil threespine stickleback  
**Michael A. Bell, Matthew P. Travis, and D. Max Blouw** 562
- Fitting and comparing models of phyletic evolution: random walks and beyond  
**Gene Hunt** 578
- The ontogeny of trilobite segmentation: a comparative approach  
**Nigel C. Hughes, Alessandro Minelli, and Giuseppe Fusco** 602
- Exploration of the Oxynoticeratidae ornamental morphospace using the discrete cosine transform (DCT) to analyze rib patterns  
**Jean-Louis Dommergues, Cyril H. Dommergues, and Christian Meister** 628
- Biomechanics of ossified tendons in ornithomimid dinosaurs  
**Chris L. Organ** 652
- Gigantism in tadpoles of the Neogene frog *Palaeobatrachus*  
**Zbyněk Roček, Ronald Böttcher, and Richard Wassersug** 666
- Author Index* 676

A quarterly journal of The Paleontological Society  
© 2006 The Paleontological Society. All rights reserved.

Mailing Date: 8 November 2006

CODEN PALBBM 32(4) 509-676 (2006)

Electronic submission (PDF format) is requested: [paleobiology@umich.edu](mailto:paleobiology@umich.edu)

Or send manuscripts to:

Roxanne Moore  
*Paleobiology*  
University of Michigan Museum of Paleontology  
1109 Geddes Rd.  
Ann Arbor, MI 48109-1079

Address all requests for **Permissions** to the Editorial Office.

You can view and download *Paleobiology* from the world wide web in four places. Volumes 1–25 are at <http://www.jstor.org>. (PDF only; requires library subscription to ecology journals within JSTOR.) Current issues back to volume 26(1) are at <http://www.bioone.org/> (with a library subscription to BioOne), and at <http://www.psjournals.org>. Titles and abstracts back to volume 22 are free at <http://allenpress.com>.

EDITORS: TOMASZ K. BAUMILLER, ROBYN J. BURNHAM, and PHILIP D. GINGERICH  
University of Michigan

*Matters of the Record*  
EDITOR: SHANAN E. PETERS  
University of Michigan

EDITORIAL ASSISTANT: ROXANNE MOORE

COPYEDITOR: NATASHA ATKINS

FOUNDING EDITORS: THOMAS J. M. SCHOPF and RALPH G. JOHNSON

Address **ALL** matters regarding **SUBSCRIPTIONS** to:

Paleobiology Subscriptions  
P.O. Box 1897  
810 East 10th St.  
Lawrence, KS.66044-8897

Although *Paleobiology* is published by The Paleontological Society, a subscription to the journal is in addition to the society dues. There are five groups of subscribers. For 2006, subscriptions are:

- (1) \$50.00 for members of the Paleontological Society and the Palaeontological Association
- (2) \$55.00 for individual nonmembers
- (3) \$25.00 for student members of the Paleontological Society and the Palaeontological Association
- (4) \$34.00 for student nonmembers
- (5) \$150.00 for institutions

Back issues: \$4.00 for members, \$16.00 for nonmembers. Price includes postage and handling.



PALEO BIOLOGY (ISSN 0094-8373) is published quarterly by The Paleontological Society, 810 East 10th St., Lawrence, KS 66044, USA. Periodicals postage paid at Lawrence, KS. POSTMASTER: Send address changes to PALEO BIOLOGY, P.O. Box 1897, 810 East 10th St., Lawrence, KS 66044-8897, USA.

PALEO BIOLOGY is printed offset by Allen Press, Inc., Lawrence, KS 66044.

 This paper meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

The Paleontological Society gratefully acknowledges Patrons of *Paleobiology* for 2006.

The Patrons Fund was established to broaden the basis of financial support for *Paleobiology* and thus to encourage paleontological publication.

\$50.00 to \$100.00,  
at the discretion of the Contributor

For you, or your institution, to become a Patron, send a check payable to *Paleobiology* to:

*Paleobiology* Patrons Fund  
P.O. Box 1897  
810 East 10th Street  
Lawrence, KS 66044-8897

**PALEOBIOLOGY PATRONS**

RICHARD P. ALVORD  
MARIE-PIERRE AUBRY  
RICHARD K. BAMBACH  
MICHAEL G. BASSETT  
DAVID J. BOTTJER  
J. DAVID BUKRY  
BEATRICE L. BURCH  
LEO W. BUSS  
SANDRA J. CARLSON  
WILLIAM A. CLEMENS JR.  
PAULO CUSTODI  
DOUGLAS K. DEW  
WILLIAM A. DIMICHELE  
J. THOMAS DUTRO  
SAMUEL R. EDWARDS  
DOUGLAS H. ERWIN  
ROBERT M. FINKS  
KARL W. FLESSA  
MICHAEL J. FOOTE  
ROBERT A. GASTALDO  
IN MEMORY OF STEPHEN J. GOULD  
JOHN C. HANDLEY  
CAROLE S. HICKMAN  
JOHN R. HORNER  
FREDERICK H. C. HOTCHKISS  
AUGUST ILG  
JEREMY B. C. JACKSON  
WANN LANGSTON JR.  
DAVID LAZARUS  
DAVID R. LINDBERG  
JERE H. LIPPS  
ERNEST L. LUNDELIUS JR.  
HARUYOSHI MAEDA  
GEORGE R. MCGHEE JR.  
FRANK K. MCKINNEY  
ARNOLD I. MILLER  
WILLIAM C. MILLER III  
WILLIAM A. OLIVER JR.  
KEVIN PADIAN  
ALLISON R. PALMER  
MARK E. PATZKOWSKY  
JOHN M. RENSBERGER  
W. BRUCE SAUNDERS  
IN MEMORY OF TOM SCHOPF  
JOSHUA B. SMITH  
SHERMAN SUTER  
JOHN M. TATE  
ROGER D. K. THOMAS  
KEITH S. THOMSON  
JAMES W. VALENTINE  
GEERAT J. VERMEIJ  
SALLY E. WALKER  
JOHNNY A. WATERS