

Supplement to *Journal of Paleontology*
(ISSN 0022-3360)
JPALAZ 60(4) II 1-47, JULY 1986

Volume 60

JULY 1986

Supplement to No. 4

Part II of II

JOURNAL OF PALEONTOLOGY

THE PALEONTOLOGICAL SOCIETY
MEMOIR 20

Ordovician Sphinctozoan Sponges
from the Eastern Klamath Mountains,
Northern California

J. KEITH RIGBY AND A. W. POTTER



Memoirs of The Paleontological Society are occasional publications consisting of monographs and symposia that are too extensive for publication in the *Journal of Paleontology* as part of the regular issues. Ordinarily, memoirs are published as supplements to a regular issue of the *Journal*. Inquiries concerning submittal of manuscripts for inclusion in the Memoir Series may be made to the Editors of the *Journal* for The Paleontological Society.

Communications concerning the cost and availability of back numbers of the Memoir Series should be addressed to the Society of Economic Paleontologists and Mineralogists, P.O. Box 979, Tulsa, Oklahoma 74101.

OFFICERS OF THE PALEONTOLOGICAL SOCIETY

For the year ending November 1986

President

NORMAN F. SOHL, Washington, DC

President-Elect

STEPHEN J. GOULD, Cambridge, MA

Past-President

HELEN TAPPAN-LOEBLICH, Los Angeles, CA

Secretary

JOHN POJETA, JR.
U.S. Geological Survey
E-501 National Museum of Natural History
Smithsonian Institution
Washington, DC 20560

Treasurer

ROGER L. KAESLER
Dept. of Geology
University of Kansas
Lawrence, KS 66045

Program Coordinator

ROGER D. K. THOMAS, Lancaster, PA

Managing Editor

RICHARD D. HOARE, Bowling Green, OH

Associate Editor

DON C. STEINKER, Bowling Green, OH

Technical Editors

RONALD R. WEST and GEORGE R. CLARK, II
Manhattan, KS

DAVID K. ELLIOTT, Flagstaff, AZ

DONALD L. WOLBERG, Socorro, NM

MARK A. WILSON, Wooster, OH

Book Review Editor

CARL F. KOCH, Norfolk, VA

Paleobiology Co-Editors

J. JOHN SEPkoski, JR., and PETER R. CRANE
Chicago, IL

Special Publications Co-Editors

THOMAS W. BROADHEAD and KENNETH R.
WALKER
Knoxville, TN

Councilors

JUNE P. ROSS, Bellingham, WA
PETER D. WARD, Seattle, WA

Section Chairpersons

North-Central: RODNEY M. FELDMANN
Kent, OH

Northeastern: JEAN M. BERDAN
Washington, DC

Pacific Coast: LINDA RITTERBUSH
Thousand Oaks, CA

Rocky Mountains: STANLEY S. BEUS
Flagstaff, AZ

Southeastern: PATRICIA H. KELLEY
University, MS

The Paleontological Society

MEMOIR 20

**ORDOVICIAN SPHINCTOZOAN SPONGES
FROM THE EASTERN KLAMATH MOUNTAINS,
NORTHERN CALIFORNIA**

J. KEITH RIGBY AND A. W. POTTER

Department of Geology, Brigham Young University, Provo, Utah 84602 and
Department of Geology, Oregon State University, Corvallis 97331

Copyright © 1986 by
THE PALEONTOLOGICAL SOCIETY, INC.
JULY 1986

CONTENTS

ABSTRACT	1
INTRODUCTION	1
REGIONAL SETTING	1
OCCURRENCES	1
MORPHOLOGY	7
EARLY PALEOZOIC OCCURRENCES AND EVOLUTION OF SPHINCTOZOAN SPONGES	8
DEPOSITORY	15
ACKNOWLEDGMENTS	15
SYSTEMATIC PALEONTOLOGY	15
CLASS Calcarea Bowerbank, 1884	15
ORDER Sphinctozoa Steinmann, 1882	15
SUBORDER Porata Seilacher, 1962	15
FAMILY Sebargasiidae Steinmann, 1882	15
GENUS <i>Amblysiphonella</i> Steinmann, 1882	15
<i>Amblysiphonella grossa</i> n. sp.	15
GENUS <i>Amblysiphonelloides</i> n. gen.	19
<i>Amblysiphonelloides tubularis</i> n. sp.	19
<i>Amblysiphonelloides reticulata</i> n. sp.	20
GENUS <i>Imperatoria</i> De Gregorio, 1930	23
<i>Imperatoria mega</i> n. sp.	23
<i>Imperatoria media</i> n. sp.	24
<i>Imperatoria minima</i> n. sp.	26
<i>Imperatoria irregularis</i> n. sp.	27
FAMILY Cystothalamiidae Girty, 1908	28
GENUS <i>Corymbospongia</i> n. gen.	28
<i>Corymbospongia adnata</i> n. sp.	28
<i>Corymbospongia mica</i> n. sp.	29
<i>Corymbospongia(?) perforata</i> n. sp.	31
SUBORDER Aporata Seilacher, 1962	32
FAMILY Celyphiidae De Laubenfels, 1955	32
GENUS <i>Cystothalamella</i> n. gen.	32
<i>Cystothalamella ducta</i> n. sp.	32
<i>Cystothalamella craticulata</i> n. sp.	34
<i>Cystothalamella tuboides</i> n. sp.	35
GENUS <i>Porefieldia</i> n. gen.	37
<i>Porefieldia robusta</i> n. sp.	38
GENUS <i>Girtyocoelia</i> Cossmann, 1909	39
<i>Girtyocoelia epiporata</i> n. sp.	39
<i>Girtyocoelia canna</i> n. sp.	40
FAMILY Cliefdenellidae Webby, 1969	41
GENUS <i>Cleifdenella</i> Webby, 1969	41
<i>Cleifdenella obconica</i> n. sp.	42
CLASS HEXACTINELLIDA Sollas, 1887	44
ORDER, FAMILY, GENUS uncertain	44
REFERENCES	44
APPENDIX	47

ILLUSTRATIONS

FIGURES 1—Locality maps	2
2—Diagrammatic columnar section in the Horseshoe Gulch area	3

3—Diagrammatic columnar sections in the Lovers Leap area	6
4—Generalized morphology of composite stylized sphinctozoan sponge	8
5—Construction models showing relationships of central tubes and axial openings in sphinctozoan sponges	8
6—Stratigraphic occurrences of Early and Middle Paleozoic sphincto- zoans and possible phylogeny	9
7—Ordovician <i>Amblysiphonella</i> and <i>Amblysiphonelloides</i>	16
8—Ordovician <i>Girtyocoelia</i> and <i>Imperatoria</i>	22
9—Ordovician <i>Imperatoria</i> , <i>Amblysiphonelloides</i> , and <i>Girtyocoelia</i> ..	25
10—Ordovician <i>Corymbospongia</i> and <i>Cystothalamiella</i>	30
11—Ordovician <i>Cliesdenella</i> and <i>Porefieldia</i>	36
TABLES	
1—Taxa and numbers of specimens recorded at various localities . . .	4