

Part III of III

# JOURNAL OF PALEONTOLOGY

---

**THE PALEONTOLOGICAL SOCIETY  
MEMOIR 37**

---

Shale-facies Microfossils  
from the Proterozoic Bylot Supergroup,  
Baffin Island, Canada

H. J. HOFMANN AND G. D. JACKSON



---

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 Managing Editor of the *Journal of Paleontology*.

For information on cost and availability of back numbers of the Memoir Series, please contact: SEPM Business Office, P.O. Box 4756, Tulsa, OK 74159, for numbers 1 (1968) through 16 (1985) or *Journal of Paleontology*, P.O. Box 1897, Lawrence, KS 66044-8897, for number 17 (1986) and following.

---

### OFFICERS OF THE SOCIETY

*For the year ending November, 1994*

*President*

STEVEN M. STANLEY, Baltimore, MD

*President-Elect*

CRAIG G. BLACK, Los Angeles, CA

*Past-President*

RODNEY M. FELDMANN, Kent, OH

*Secretary*

DONALD L. WOLBERG  
P.O. Box 803  
Socorro, NM 87801

*Treasurer*

JOHNNY A. WATERS  
Dept. of Geology  
West Georgia College  
Carrollton, GA 30118

*Program Coordinator*

PETER M. SHEEHAN, Milwaukee, WI

*Managing Editor*

DON C. STEINKER, Bowling Green, OH

*Technical Editors*

RICHARD D. HOARE, Bowling Green, OH  
DAVID K. ELLIOTT, Flagstaff, AZ  
PATRICIA H. KELLEY, Grand Forks, ND  
DANIEL B. BLAKE, Urbana, IL  
ELLEN COMPTON-GOODING, Martinsville, VA  
CARL W. STOCK, Tuscaloosa, AL  
MICHAEL R. SANDY, Dayton, OH  
DONALD R. PROTHERO, Los Angeles, CA

*Paleobiology Co-Editors*

DAVID L. MEYER and ARNOLD I. MILLER  
Cincinnati, OH

*Special Publications Co-Editors*

R. S. SPENCER and C. F. KOCH  
Norfolk, VA

*Councilors*

DANA H. GEARY, Madison, WI  
FRANK M. MCKINNEY, Boone, NC

*Section Chairpersons*

North-Central: DANITA S. BRANDT  
East Lansing, MI  
Northeastern: CONSTANCE M. SOJA  
Northampton, MA  
Pacific Coast: SANDRA J. CARLSON  
Davis, CA  
Rocky Mountain: EMMETT EVANOFF  
Boulder, CO  
Southeastern: DOUGLAS S. JONES  
Gainesville, FL  
South-Central: ARTHUR B. BUSBEY III  
Fort Worth, TX

The Paleontological Society

MEMOIR 37

**SHALE-FACIES MICROFOSSILS  
FROM THE PROTEROZOIC BYLOT SUPERGROUP,  
BAFFIN ISLAND, CANADA**

**H. J. HOFMANN AND G. D. JACKSON**

Department of Geology, University of Montreal, Box 6128, Station A, Montreal, Quebec H3C 3J7, Canada and  
Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada

Copyright © 1994 *by*  
THE PALEONTOLOGICAL SOCIETY, INC.  
JULY 1994

## CONTENTS

ABSTRACT .....	1
INTRODUCTION .....	1
REGIONAL GEOLOGY .....	1
METHOD OF STUDY .....	3
RESULTS AND DISCUSSION .....	5
STRATIGRAPHIC DISTRIBUTION .....	5
PALEOENVIRONMENTS .....	5
TAXONOMIC DISTRIBUTION .....	7
BIOSTRATIGRAPHY .....	7
SYSTEMATIC PALEONTOLOGY .....	9
GROUP Cryptarcha Diver and Peat, 1979 .....	10
SUBGROUP Nematomorphitae Diver and Peat, 1979 .....	10
GENUS <i>Siphonophycus</i> Schopf, 1968, emend. Knoll, Swett, and Mark, 1991 .....	10
<i>Siphonophycus septatum</i> (Schopf, 1968) .....	10
<i>Siphonophycus robustum</i> (Schopf, 1968) .....	10
<i>Siphonophycus rugosum</i> (Maithy, 1975) n. comb. ....	10
<i>Siphonophycus kestron</i> Schopf, 1968 .....	12
<i>Siphonophycus capitaneum</i> Nyberg and Schopf, 1984 ..	12
GENUS <i>Pellicularia</i> Yankauskas, 1980b .....	12
<i>Pellicularia tenera</i> Yankauskas, 1980b .....	12
GENUS <i>Polythrighoides</i> German, 1974, emend. Timofeev et al., 1976 .....	12
<i>Polythrighoides lineatus</i> German, 1974, emend. Knoll et al., 1991 .....	12
GENUS <i>Obruchevella</i> Reitlinger, 1948 .....	13
<i>Obruchevella valdaica</i> (Shepeleva ex Aseeva, 1974) ....	13
GENUS <i>Karamia</i> Kolosov, 1984 .....	15
<i>Karamia?</i> sp. ....	15
Opaque filaments .....	15
GENUS <i>Oscillatoriopsis</i> Schopf, 1968 .....	15
<i>Oscillatoriopsis</i> spp. ....	15
GENUS <i>Palaeolyngbya</i> Schopf, 1968 .....	17
<i>Palaeolyngbya</i> sp. ....	17
GENUS <i>Nostocomorpha</i> Xing and Liu, 1978 .....	17
<i>Nostocomorpha</i> sp. ....	17
GENUS <i>Arctacellularia</i> German in Timofeev et al., 1976 ..	17
<i>Arctacellularia tetragonala</i> (Maithy, 1975) n. comb. emend. ....	18
<i>Arctacellularia ellipsoidea</i> German in Timofeev et al., 1976 .....	18
GENUS <i>Chlorogloeopsis</i> Maithy, 1975, emend., nom. corr. ...	18
<i>Chlorogloeopsis contexta</i> (German, 1976) n. comb. ....	19
<i>Chlorogloeopsis kanshiensis</i> (Maithy, 1975) n. comb. ...	20
SUBGROUP Netromorphitae Downie, Evitt, and Sarjeant, 1963 .....	20
GENUS <i>Navifusa</i> Combaz, Lange, and Pansant, 1967 .....	20
<i>Navifusa bacillaris</i> (German, 1981b) n. comb. ....	20
<i>Navifusa majensis</i> Pyatiletov, 1980a .....	20
<i>Navifusa actinomorpha</i> (Maithy, 1975) emend., n. comb. ...	20
SUBGROUP Sphaeromorphitae Downie, Evitt, and Sarjeant, 1963 .....	21
GENUS <i>Leiosphaeridia</i> Eisenack, 1958, emend. Downie and Sarjeant, 1963, emend. Turner, 1984 .....	21
<i>Leiosphaeridia minutissima</i> (Naumova, 1949) emend. Yankauskas in Yankauskas et al., 1989 .....	21
<i>Leiosphaeridia tenuissima</i> Eisenack, 1958 .....	22
<i>Leiosphaeridia crassa</i> (Naumova, 1949) emend. Yankauskas in Yankauskas et al., 1989 .....	22
<i>Leiosphaeridia jacutica</i> (Timofeev, 1966) emend. Mikhaylova and Yankauskas in Yankauskas et al., 1989 .....	22
<i>Leiosphaeridia ternata</i> (Timofeev, 1966) emend. Mikhaylova and Yankauskas in Yankauskas et al., 1989 .....	22
GENUS <i>Lophosphaeridium</i> Timofeev, 1959, ex Downie, 1963 .....	22
<i>Lophosphaeridium granulatum</i> Maithy, 1975 .....	22
GENUS <i>Valeria</i> Yankauskas, 1982 .....	24
<i>Valeria lophostriata</i> (Yankauskas, 1979b) .....	24
GENUS <i>Pterospermopsimorpha</i> Timofeev, 1966, emend. Mikhaylova and Yankauskas in Yankauskas et al., 1989 .....	24
<i>Pterospermopsimorpha insolita</i> Timofeev, 1969, emend. Mikhaylova in Yankauskas et al., 1989 .....	24
SUBGROUP Synaplomorphitae Diver and Peat, 1979 .....	24
GENUS <i>Eomicrocystis</i> Golovenok and Belova, 1984 .....	24
<i>Eomicrocystis elegans</i> Golovenok and Belova, 1984 ...	24
<i>Eomicrocystis malgica</i> Golovenok and Belova, 1986 ...	25
GENUS <i>Symplassosphaeridium</i> Timofeev, 1959, ex Timofeev, 1969 .....	25
<i>Symplassosphaeridium</i> spp. ....	25
GENUS <i>Synsphaeridium</i> Eisenack, 1965 .....	25
<i>Synsphaeridium</i> spp. ....	25
GENUS <i>Satka</i> Yankauskas, 1979b .....	28
<i>Satka squamifera</i> Pyatiletov, 1980c .....	28
<i>Satka</i> spp. ....	28
GENUS <i>Coneosphaera</i> Luo, 1991 .....	28
<i>Coneosphaera arctica</i> Hofmann n. sp. ....	28
<i>Coneosphaera</i> sp. ....	30
GENUS <i>Spumosina</i> Naumova, 1968, emend. Yankauskas and Medvedeva in Yankauskas et al., 1989 .....	30
<i>Spumosina rubiginosa</i> (Andreeva, 1966) .....	30
GENUS <i>Fabiformis</i> Pyatiletov, 1988 .....	31
<i>Fabiformis baffinensis</i> Hofmann n. sp. ....	31
OTHER REMAINS .....	31
GENUS <i>Palaeocalothrix</i> German, 1981a .....	31
<i>Palaeocalothrix divaricatus</i> German, 1981a .....	31
ACKNOWLEDGMENTS .....	31
REFERENCES .....	31
APPENDIX .....	31
1—Locality and microfossil data for samples from Bylot Supergroup .....	36

## ILLUSTRATIONS

FIGURES .....	31
1—General geologic map of Borden Basin, with sample localities .....	2
2—General stratigraphic section of Bylot Supergroup, with sample localities .....	4

3—Geographic distribution of fossiliferous and barren samples by stratigraphic unit	6	14—Size distribution of <i>Navifusa</i>	20
4—Synopsis of Bylot Supergroup microbiota	8	15— <i>Navifusa majensis</i> ; <i>Navifusa actinomorpha</i> ; <i>Leiosphaeridia minutissima</i> ; <i>Leiosphaeridia crassa</i>	23
5—Abundance of taxa	10	16—Size-frequency histogram of sphaeromorphs assigned to <i>Leiosphaeridia</i>	24
6—Regional variations of selected taxa	11	17— <i>Leiosphaeridia jacutica</i> ; <i>Leiosphaeridia ternata</i> ; <i>Lophosphaeridium granulatum</i> ; <i>Pterospermopsimorpha insolita</i> ; <i>Valeria lophostriata</i>	26
7—Dendrograms comparing microfossil assemblages from different stratigraphic units	12	18— <i>Eomicrocystis elegans</i> ; <i>Eomicrocystis malgica</i> ; <i>Symplassosphaeridium</i> spp.; <i>Synsphaeridium</i> spp.; <i>Coneosphaera</i> sp.; <i>Satka squamifera</i> ; <i>Satka</i> spp.	27
8—Dendrogram illustrating co-occurrence of taxa	12	19— <i>Coneosphaera arctica</i> n. sp.; <i>Valeria lophostriata</i> ; <i>Spumosina rubiginosa</i> ; <i>Fabiformis baffinensis</i> n. sp.; <i>Palaeocalothrix divaricata</i>	29
9—Palinspastic map showing distribution of Bylot and correlative microbiotas	13	20—Size distribution of specimens of <i>Spumosina</i> and <i>Fabiformis</i>	30
10—Size-frequency histogram of tubular filaments	13		
11— <i>Siphonophycus septatum</i> ; <i>Siphonophycus robustum</i> ; <i>Siphonophycus rugosum</i> ; <i>Siphonophycus kestron</i> ; <i>Siphonophycus capitaneum</i> ; <i>Pellicularia tenera</i> ; <i>Polytrichoides lineatus</i> ; <i>Obruchevella valdaica</i>	14		
12—Opaque filaments; <i>Oscillatoriopsis</i> sp.; <i>Chlorogloeaopsis contexta</i> ; <i>Chlorogloeaopsis kanshiensis</i> ; <i>Arctacellularia ellipsoidea</i> ; <i>Arctacellularia tetragonala</i> ; <i>Palaeolyngbya</i> sp.; <i>Navifusa bacillaris</i>	16		
13— <i>Nostocomorpha</i> sp.; <i>Leiosphaeridia</i> spp.	18		

TABLE

1—Reported size ranges of species of <i>Arctacellularia</i>	19
---	----