

PART H, Revised

BRACHIOPODA

VOLUMES 2 & 3:

Linguliformea, Craniiformea, and Rhynchonelliformea (part)

ALWYN WILLIAMS, S. J. CARLSON, C. H. C. BRUNTON, L. E. HOLMER, L. E. POPOV,
MICHAL MERGL, J. R. LAURIE, M. G. BASSETT, L. R. M. COCKS, RONG JIA-YU,
S. S. LAZAREV, R. E. GRANT, P. R. RACHEBOEUF, JIN YU-GAN, B. R. WARDLAW,
D. A. T. HARPER, A. D. WRIGHT, and MADIS RUBEL

CONTENTS

INFORMATION ON TREATISE VOLUMES	x
EDITORIAL PREFACE	xi
STRATIGRAPHIC DIVISIONS	xxiv
COORDINATING AUTHOR'S PREFACE (Alwyn Williams)	xxv
BRACHIOPOD CLASSIFICATION	
(Alwyn Williams, Sandra J. Carlson, and C. Howard C. Brunton)	1
Historical Review	1
Basis for Classification	5
Methods	5
Genealogies	6
Recent Brachiopods	6
Cambro-Ordovician Brachiopods	9
Reconciliation of Recent and Cambro-Ordovician Genealogies	17
THE SUPRAORDINAL CLASSIFICATION	18
OUTLINE OF SUPRAFAMILIAL CLASSIFICATION AND AUTHORSHIP	22
Phylum BRACHIOPODA	
(Alwyn Williams, Sandra J. Carlson, and C. Howard C. Brunton)	28
Subphylum LINGULIFORMEA	
(Alwyn Williams, Sandra J. Carlson, and C. Howard C. Brunton)	30
Class LINGULATA (Lars E. Holmer and Leonid E. Popov)	30
Order LINGULIDA (Lars E. Holmer and Leonid E. Popov)	32
Superfamily LINGULOIDEA	32
Family LINGULIDAE	35
Family PSEUDOLINGULIDAE	39
Family OBOLIDAE	40
Family EOLOBOLIDAE	61
Family ZHANATELLIDAE	61
Family ELKANIIDAE	67
Family AULONOTRETIDAE	72
Family LINGULELLOTRETIDAE	72
Family LINGULASMATIDAE	75
Family PATERULIDAE	75
Family DYSORISTIDAE	75
Family UNCERTAIN	77
Superfamily DISCINOIDEA	79
Family TREMATIDAE	83

Family DISCINIDAE	86
Superfamily ACROTHELOIDEA	90
Family ACROTHELIDAE	92
Family BOTSFORDIIDAE	95
Order ACROTRETIDA	97
Superfamily ACROTRETOIDEA	98
Family ACROTRETIDAE	103
Family SCAPHELASMATIDAE	122
Family TORYNELASMATIDAE	124
Family EPHIPPELASMATIDAE	127
Family BIERNATIDAE	130
Family CERATRETIDAE	132
Family EOCONULIDAE	133
Family CURTICIIDAE	136
Family UNCERTAIN	136
Order SIPHONOTRETIDA	136
Superfamily SIPHONOTRETOIDEA	136
Family SIPHONOTRETIDAE	139
Class PATERINATA (J. R. Laurie)	147
Order PATERINIDA	147
Musculature	147
Mantle Canals	148
Shell Structure	149
Larval Shell Morphology	150
Relationships	150
Superfamily PATERINOIDEA	150
Family PATERINIDAE	150
Family CRYPTOTRETIDAE	153
Brachiopod-like Fossils	156
Family MICKWITZIIDAE	156
Family TIANZHUSHANELLIDAE	156
Subphylum CRANIIFORMEA	
(Alwyn Williams, Sandra J. Carlson, and C. Howard C. Brunton)	158
Class CRANIATA (Leonid E. Popov, Michael G. Bassett, and Lars E. Holmer)	158
Order CRANIOPSIDA (Leonid E. Popov and Lars E. Holmer)	164
Superfamily CRANIOPSOIDEA	164
Family CRANIOPSIDAE	164
Order CRANIIIDA (Michael G. Bassett)	169
Superfamily CRANIOIDEA	170
Family CRANIIDAE	171
Order TRIMERELLIDA (Leonid E. Popov and Lars E. Holmer)	184
Superfamily TRIMERELLOIDEA	185
Family TRIMERELLIDAE	185
Family ADENSUIDAE	191
Family USSUNIIDAE	192
Subphylum RHYNCHONELLIFORMEA	
(Alwyn Williams, Sandra J. Carlson, and C. Howard C. Brunton)	193
Class CHILEATA (Leonid E. Popov and Lars E. Holmer)	193
Order CHILEIDA	193
Superfamily MATUTELLOIDEA	195

Family MATUTELLIDAE	195
Family CHILEIDAE	196
Order DICTYONELLIDA (Lars E. Holmer)	196
Superfamily EICHWALDIOIDEA	198
Family EICHWALDIIDAE	198
Family ISOGRAMMIDIIDAE	200
Class OBOLELLATA (Leonid E. Popov and Lars E. Holmer)	200
Order OBOLELLIDA	201
Superfamily OBOLELLOIDEA	201
Family OBOLELLIDAE	201
Family TREMATOBOLIDAE	205
Superfamily UNCERTAIN	206
Order NAUKATIDA	207
Superfamily NAUKATOIDEA	207
Family NAUKATIDAE	207
Class KUTORGINATA (Leonid E. Popov and Alwyn Williams)	208
Order KUTORGINIDA	211
Superfamily KUTORGINOIDEA	211
Family KUTORGINIDAE	211
Superfamily NISUSIOIDEA	213
Family NISUSIIDAE	213
Class STROPHOMENATA	
(Alwyn Williams, C. Howard C. Brunton, and L. R. M. Cocks)	215
Order STROPHOMENIDA (L. R. M. Cocks and Rong Jia-yu)	216
Superfamily STROPHOMENOIDEA	217
Family STROPHOMENIDAE	220
Family RAFINESQUINIDAE	237
Family GLYPTOMENIDAE	252
Family FOLIOMENIDAE	256
Family CHRISTIANIIDAE	256
Family LEPTAENOIDEIDAE	258
Family AMPHISTROPHIIDAE	260
Family DOUVILLINIDAE	266
Family LEPTOSTROPHIIDAE	278
Family EOPHOLIDOSTROPHIIDAE	289
Family STROPHODONTIDAE	292
Family SHALERIIDAE	300
Family STROPHONELLIDAE	302
Family UNCERTAIN	302
Superfamily PLECTAMBONITOIDEA	304
Family PLECTAMBONITIDAE	305
Family TAFFIIDAE	309
Family BIMURIIDAE	317
Family SYNDIELASMATIDAE	317
Family LEPTELLINIDAE	319
Family GRORUDIIDAE	327
Family LEPTESTIIIDAE	331
Family XENAMBONITIDAE	334
Family HESPEROMENIDAE	337
Family SOWERBYELLIDAE	340

Plectambonitoidean Genera Unassigned to Families	347
Suborder UNCERTAIN (Alwyn Williams and C. Howard C. Brunton)	348
Family EOCRAMATIIDAE	348
Order PRODUCTIDA (C. Howard C. Brunton, S. S. Lazarev, and R. E. Grant)	350
Productida excluding the Chonetidina	350
History	350
Present situation	352
Morphology	352
Morphological changes	356
Terminology	358
Using the Classification	361
Suborder CHONETIDINA (Patrick R. Racheboeuf)	362
Superfamily CHONETOIDEA	368
Family STROPHOCHONETIDAE	369
Family CHONOSTROPHIIDAE	380
Family ANOPLIIDAE	382
Family EODEVONARIIDAE	390
Family CHONETIDAE	392
Family RUGOSOCHONETIDAE	404
Family DAVIESIELLIDAE	421
Suborder PRODUCTIDINA	
(C. Howard C. Brunton, S. S. Lazarev, R. E. Grant, and Jin Yu-gan)	424
Superfamily PRODUCTOIDEA	424
Family PRODUCTELLIDAE	424
Family PRODUCTIDAE	467
Superfamily ECHINOCONCHOIDEA	509
Family ECHINOCONCHIDAE	509
Family SENTOSIIDAE	522
Family UNCERTAIN	526
Superfamily LINOPRODUCTOIDEA	526
Family LINOPRODUCTIDAE	526
Family MONTICULIFERIDAE	536
Superfamily UNCERTAIN	564
Suborder STROPHALOSIIDINA	565
Superfamily STROPHALOSIOIDEA	565
Family STROPHALOSIIDAE	565
Family CHONOPECTIDAE	574
Family ARAKSALOSIIDAE.....	576
Superfamily AULOSTEGOIDEA	587
Family AULOSTEGIDAE	587
Family COOPERINIDAE	605
Family SCACCHINELLIDAE	607
Superfamily RICHTHOFENIOIDEA	
(Bruce Wardlaw, R. E. Grant, and C. Howard C. Brunton)	610
Family RICHTHOFENIIDAE	611
Family HERCOSIIDAE	612
Family CYCLACANTHARIIDAE	615
Family GEMMELLAROIIDAE	617
Suborder LYTTONIIDINA	
(Alwyn Williams, David A. T. Harper, and R. E. Grant)	619

Superfamily LYTTONIOIDEA	630
Family LYTTONIIDAE	631
Family RIGBYELLIDAE	638
Superfamily PERMIANELLOIDEA	639
Family PERMIANELLIDAE	639
Family UNCERTAIN	641
Suborder UNCERTAIN	
(C. Howard C. Brunton, S. S. Lazarev, R. E. Grant, and Jin Yu-gan)	642
Nomina nuda	642
Order ORTHOTETIDA	
(Alwyn Williams, C. Howard C. Brunton, and A. D. Wright)	644
Suborder ORTHOTETIDINA (Alwyn Williams and C. Howard C. Brunton)	644
Superfamily ORTHOTETOIDEA	649
Family ORTHOTETIDAE	649
Family PULSIIDAE	652
Family ORTHOTETELLIDAE	654
Family DERBYIIDAE	657
Family MEEKELLIDAE	660
Family SCHUCHERTELLIDAE	664
Superfamily CHILIDIOPSIDEA	670
Family CHILIDIOPSIDAE	671
Family AREOSTROPHIIDAE	677
Suborder TRIPLESIIDINA (A. D. Wright)	681
Superfamily TRIPLESIOIDEA	683
Family TRIPLESIIDAE	683
Order BILLINGSELLIDA (Alwyn Williams and David A. T. Harper)	689
Suborder BILLINGSELLIDINA	690
Superfamily BILLINGSELLOIDEA	691
Family BILLINGSELLIDAE	692
Suborder CLITAMBONITIDINA (Madis Rubel and A. D. Wright)	692
Superfamily CLITAMBONITOIDEA	695
Family CLITAMBONITIDAE	695
Family GONAMBONITIDAE	704
Superfamily POLYTOECHIOIDEA	707
Family POLYTOECHIIDAE	707
Class RHYNCHONELLATA (Alwyn Williams and Sandra J. Carlson)	708
Order PROTORTHIDA (Alwyn Williams and David A. T. Harper)	709
Superfamily PROTORTHOIDEA	710
Family PROTORTHIDAE	710
Family ARCTOHEDRIDAE	710
Family LEIORIIDAE	711
Superfamily SKENIDIOIDEA	712
Family SKENIDIIDAE	712
Order ORTHIDA (Alwyn Williams and David A. T. Harper)	714
Suborder ORTHIDINA	724
Superfamily ORTHOIDEA	724
Family ORTHIDAE	724
Family ANOMALORTHIDAE	728
Family BOHEMIELLIDAE	731
Family GLYPTORTHIDAE	733

Family HESPERONOMIIDAE	736
Family HESPERORTHIDAE	737
Family LYCOPHORIIDAE	740
Family NANORTHIDAE	742
Family ORTHIDIELLIDAE	745
Family PLAESIOMYIDAE	747
Family PORAMBORTHIDAE	750
Family PRODUCTORTHIDAE	750
Family WHITTARDIIDAE	755
Superfamily PLECTORTHOIDEA.....	756
Family PLECTORTHIDAE	757
Family CREMNORTHIDAE	762
Family CYCLOCOELEIIDAE	764
Family EOORTHIDAE	765
Family EUORTHISINIDAE	769
Family FINKELNBURGIIDAE	769
Family GIRALDIELLIDAE	771
Family PHRAGMORTHIDAE	774
Family PLATYSTROPHIIDAE	775
Family RANORTHIDAE	776
Family RHACTORTHIDAE	778
Family TASMANORTHIDAE	779
Family WANGYUIIDAE	779
Suborder DALMANELLIDINA (David A. T. Harper).....	782
Superfamily DALMANELLOIDEA	783
Family DALMANELLIDAE	783
Family ANGUSTICARDINIIDAE	799
Family DICOELOSIIDAE	799
Family HARKNESSELLIDAE	800
Family HETERORTHIDAE	802
Family HYPSONYONIIDAE	808
Family KAYSERELLIDAE	808
Family MYSTROPHORIDAE	808
Family PAURORTHIDAE	810
Family PLATYORTHIDAE	810
Family PORTRANELLIDAE	814
Family PROSCHIZOPHORIIDAE	814
Family RHIPIDOMELLIDAE	817
Family TYRONELLIDAE	822
Superfamily ENTELETOIDEA	823
Family ENTELETIDAE	823
Family DRABOVIIDAE	825
Family CHRUSTENOPORIDAE	836
Family LINOPORELLIDAE	836
Family SAUKRODICTYIDAE	839
Family SCHIZOPHORIIDAE	840
Suborder UNCERTAIN (Alwyn Williams and David A. T. Harper)	845
References	847
Index	903