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An illustrated catalogue and revised classification of Paleozoic radiolarian genera

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KEY WORDS

Radiolaria,
Paleozoic,
catalogue,
taxonomic revision,
type species.

ABSTRACT

The purpose of this paper is to present a revised classification of Paleozoic radiolarians at the genus level in the form of a series of plates displaying the images of the type species of each genus. These photos are supplemented by an indication of the status of the genus decided by an international team of specialists in this fossil group (Chapter “The catalogue”). The catalogue itself is presented by orders and families. It is also possible to find a genus using the alphabetical list or the list according to the classification (Appendices 1 and 2). After some remarks that illustrate the complex task undertaken to reach a consensus, a “guide for users” is proposed.

RÉSUMÉ

Catalogue illustré et classification révisée des genres de radiolaires paléozoïques.

Le but du présent document est de présenter une classification révisée des radiolaires du Paléozoïque à l'échelle des genres, sous la forme d'une série de planches présentant les images des espèces types. Ces images sont complétées par l'indication du statut du genre décidé par une équipe internationale de spécialistes de ce groupe fossile (chapitre « The catalogue »). Le catalogue est organisé par ordres et par familles, mais il est également possible de trouver un genre en utilisant la liste alphabétique ou celle suivant la classification (Annexes 1 et 2). Après quelques remarques montrant le travail complexe effectué pour aboutir à un consensus, un « guide pour les utilisateurs » est proposé.

MOTS CLÉS

Radiolaria,
Paléozoïque,
catalogue,
révision taxonomique,
espèces types.

INTRODUCTION

As for many other microorganisms, the study of radiolarians started during the end of the 19th century. However, we had to wait until the 1950s for modern studies, which have been possible thanks to improvements in microscopy (Deflandre 1952; Foreman 1963; Holdsworth 1966). The use of the Paleozoic radiolarian skeletons as biostratigraphic tools started during the 1980s particularly in Japan (e.g. Ishiga & Imoto 1980; Takemura & Nakaseko 1981; Caridroit & De Wever 1984; see also Danelian *et al.* 2017 in this issue). The new biostratigraphic age constraints provided by radiolarians were foundational in reshaping tectonic reinterpretations of complex orogenic belts around the world.

In Japan and in Asia radiolarian skeletons have been mainly extracted from siliceous distal sedimentary rocks (radiolarites s.l.). Fossil preservation was commonly medium to poor and the extraction methods using HF destroyed some additional information. From limestones, radiolarian skeletons, where preserved, may be commonly well- to very well-preserved and the extraction methods have no destructive effect on their siliceous skeletons, given that the acids used are typically acetic or hydrochloric acid. Likewise, radiolarians recovered from phosphatic concretions may be exquisitely preserved and offer a myriad of characters and details that are missing in those specimens extracted from radiolarites.

The differential preservation of fossil radiolarians in limestone has a direct influence on taxonomic interpretation and, as such, in some of the challenges that we faced while preparing this catalogue. Taxa from radiolarites have been defined on the basis of simple characteristics, which for radiolarians

described from proximal deposits, taxonomic discrimination is sometimes based on minute details. In some instances, radiolarian skeletons are fragmentary and not all features are preserved. The significance of fragmentary type material cannot be evaluated if more complete specimens are not found or observed. This has occasionally resulted in the erroneous establishment of new taxa and increased the number of synonyms (e.g. *Follicucullus* sp. B which is the apical part of *Follicucullus monacanthus*, in Ishiga *et al.* 1982b).

Radiolaria are known from the Cambrian onwards (Won & Below 1999; Obut & Iwata 2000; Pouille *et al.* 2011) and remain an important component of the oceanic plankton. Unfortunately, it is currently impossible to culture radiolarians and very difficult to maintain them alive in laboratory conditions. Their reproduction, ontogeny and possible dimorphisms are aspects that are very poorly understood. Thus, taxonomists have to rely on observations and interpret data based on the fossil record.

As for many other microorganisms, observation techniques improved greatly since the end of the 19th century with the advent of scanning electron microscopy. Naturally, the taxonomic approaches for the classification of radiolarians took advantage of this new instrumentation. Comparing simple drawings and thin section photos from older taxonomic works with pictures of high definition obtained using scanning electron microscopy may be an important source of the lack of clarity in applying older taxonomic concepts.

The totality of preservational and observational challenges in describing radiolarians, combined with a wide array of radiolarists with different styles and approaches to taxonomy has necessitated this comprehensive review of radiolarian genera

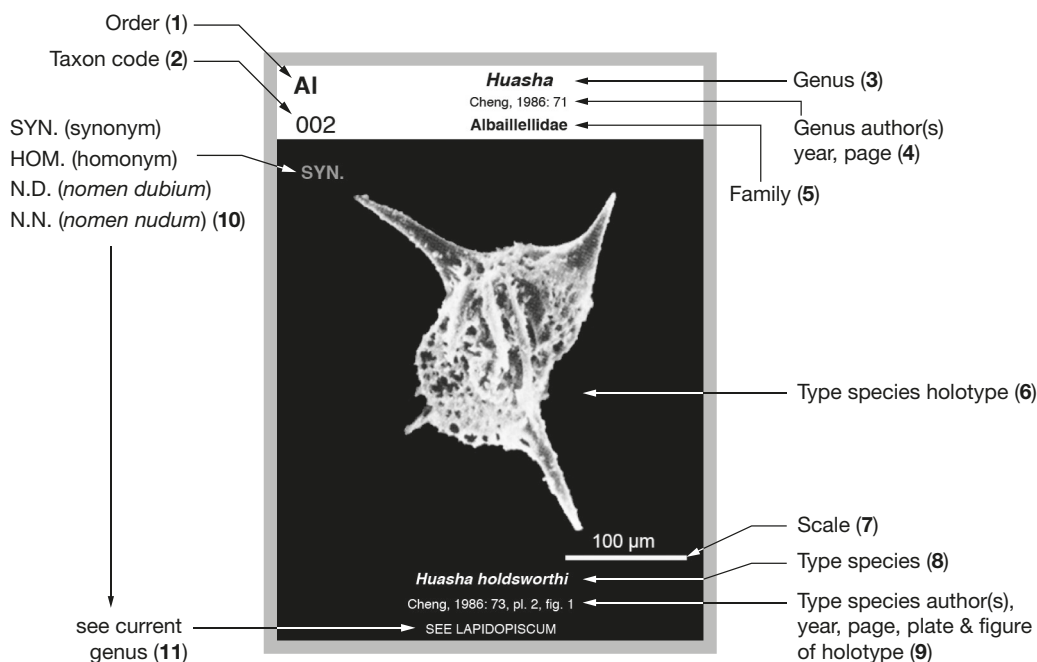


FIG. 1. — Key captions for images in the catalogue of Paleozoic radiolarian genera. 1, Order: Albalilellaria (Al), Archaeospicularia (Ar), Entactinaria (E), Latentifistularia (L), ?Nassellaria (N), Spumellaria (S). 2, Taxon code: this is the number of the genus in this publication; since the plates are arranged taxonomically, this number which is indicated in the alphabetic index (Appendix 1) allows a quick search of the plates. 3, Genus: nominal genus as in the original publication. 4, Genus authority: author of the nominal genus and page where it was described; usually only one page is cited, the page on which the main generic description begins (not necessarily the page on which the genus is first mentioned). 5, Family: this is the family position adopted in this revision. 6, Image: reillustration of the holotype of the type species. 7, Scale: the magnification is indicated by this graphic scale bar. 8, Type species: this is the nominal species fixed (see alphabetic index in Appendix 1) as type for the genus. 9, Type species authorship: author of the type species with indication of page description, year, plate and figure where the image of the holotype was first illustrated. 10, Status: when this field is not allocated the genus must be regarded as valid; **SYN.**, indicates that the genus is regarded as a synonym of a previously described genus; **HOM.**, indicates that the nominal genus is an homonym of a previously described taxon; **INV.**, is employed for invalid names; **N.D.**, indicates a name of questionable application; **N.N.**, indicates a name published without an accompanying description. If any of these abbreviations occur (or are utilized), the reader is referred to the bottom line for information on the current valid name for the genus. 11, Bottom line: this line links to the valid name for a homonym or synonym.

by our working group, as had been done for the Mesozoic forms (O'Dogherty *et al.* 2009). During two meetings with all members, several partial meetings and many exchanges over several years, we have come to a consensus on 344 genera of Paleozoic radiolarians. The aim of the discussions was to agree on the systematics and to achieve a taxonomic consensus of all contributors. The final result is this volume that is presented as a database of all described Paleozoic radiolarian genera with re-illustration of their type species. Although the main purpose was to stabilize the systematics at generic level, suprageneric classification at order and family level were also examined.

Since a sharply defined taxonomic framework is a prerequisite for the establishment and application of useful biostratigraphic schemes, it is our hope that this publication will be a useful tool for future research on Paleozoic radiolarian biostratigraphy. Presently, and particularly in the Lower Paleozoic, for most of the type species, more data are needed and more correlations are necessary in order to improve the reliability of estimated age ranges. For this reason, we were not able to provide greater resolution of the stratigraphic range of many Paleozoic radiolarian genera, as this has been done for the Mesozoic genera. Nevertheless, a chapter is devoted to Paleozoic radiolarian biostratigraphy (Aitchison *et al.* 2017a) demonstrating the potential of these fossils. Another part of this present volume (Noble *et al.* 2017) is a compilation of all the original descriptions of all genera illustrated in the present

paper, including English translations, and remarks regarding their present treatment. Finally an inventory of Paleozoic species described so far is given by Aitchison *et al.* (2017b).

SOURCE OF DATA AND DISCUSSION

Given the high diversity of Paleozoic radiolarians and their recurrent misclassification at the generic level, it has become increasingly difficult, especially for those new to this field, to find and digest all available taxonomic information and to evaluate the validity of all existing names of radiolarian taxa. Consequently, the primary goal of this publication was to present all the hitherto described Paleozoic radiolarian genera, and to revise their status and family assignment. Such a compilation will certainly facilitate everyday work for radiolarian researchers and will also serve to establish a taxonomic basis for on-going refinements of Paleozoic radiolarian stratigraphy.

The sources used to establish the list of Paleozoic genera were at first the databases personally built by Luis O'Dogherty with additions from the one of Noritoshi Suzuki, both co-authors of this catalogue. After discussion on a preliminary catalogue, all co-authors contributed with their own information to complete the list. Discussions on the status of each genus took place during two main meet-

ings: one in Lille University (September 2011) the other during the 13th InterRad meeting at Cadiz (March 2012). Several partial meetings were held in Lille University and many e-mail exchanges allowed this final consensus.

REMARK ON SPHERICAL RADIOLARIANS

The guiding principle in the classification of radiolarians at the suprageneric level is that the structure of the initial skeletal elements is the most conservative through evolution and represents the common element characterizing a family group. With ontogeny, new skeletal elements are placed progressively further away from the initial skeleton and this is the reason why some external differences are occasionally observed in a family group. The reader is referred to the general taxonomy in De Wever *et al.* (2001) for a more thorough explanation of this principle. Although the inventory of initial structures (especially in Entactinaria and Spumellaria) is still limited and their understanding fragmentary, this review fully agrees with the importance of such elements at higher systematic levels.

GUIDE FOR THE USER

Ideally, this image catalogue of genera can serve as a quick visual tool allowing the identification of genera. For this reason, each genus is labeled with the most basic information (see Fig. 1).

FIGURES

Each genus has an individual taxon code, or image number, arranged sequentially in the images on the plates. The taxon code is a number without taxonomic significance but is used as an internal indexing number used to find taxa on the plates. Since the genera follow a taxonomic arrangement, this number, which is also indicated in the alphabetic index, allows a quick search of the plates. We have scanned and reproduced images at the highest definition for each type species. These are accompanied by a scale bar made from the measurements indicated in the original publication.

ARRANGEMENT OF FIGURES

The figured genera are arranged on the plates taxonomically rather than alphabetically because, from a systematic point of view, we prefer to group taxa having taxonomically significant affinities. The genera are grouped first by order (Albaillellaria, Archaeospicularia, Entactinaria, Latentifistularia, ?Nassellaria, Spumellaria) and then arranged by family. We have followed the gross suprageneric framework presented in De Wever *et al.* (2001), which has been further improved as a consequence of this taxonomic review.

HOMONYMS AND SYNONYMS

When a case of homonymy was detected, or a taxon has been designed or suspected to be a synonym, this is indicated in the upper left part of the figure box (see Fig. 1). In such cases the line underneath the figure refers to the correct genus.

The taxa were carefully reviewed and re-examined and many genera (82) were declared to be synonyms. An interesting observation derived from this study is that many of these synonymous taxa were established on very few morphological characteristics leading in most cases to a monotypic genus.

NAMES OF DOUBTFUL APPLICATION

Those genera considered *nomina dubia* (35) are indicated beneath the figure (see Fig. 1) and the majority of these are presented at the end of the catalogue without family assignment. The only exceptions are those *nomina dubia* related to or classically attached to a specific family. Such forms are allocated beside the closer representatives of the corresponding family group. Most of the genera here considered *nomina dubia* are those taxa described from thin sections or using simple microscopes by the pioneers of the study of Mesozoic and Paleozoic radiolarians.

NOMINA NUDA

These names or nomenclatural acts are void of type-species which were never illustrated; two genera are involved.

AUTHORS

The general recommendations of the ICZN (Appendix B. 12) clearly state that in those cases where a name was published by more than two authors, the surname of the first author (as given in the original publication) may be cited alone in the text and followed by the term “*et al.*” However, we have preferred to give the surnames of all authors.

CONCLUSION

The main goal of this catalogue is to present a complete and reviewed set of all existing Paleozoic genera with illustration of their type species publishing until 2016. We hope that this catalogue of radiolarian type species will be a useful tool in future systematic and biostratigraphic studies.

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ALBAILLELLARIA Deflandre, 1953

ALBAILLELLIDAE

Deflandre, 1953 *sensu* Holdsworth (1977)

- 1 *Albaillella*
- 2 *Huasha* (syn.)
- 3 *Imotoella* (syn.)
- 4 *Lapidopiscum*
- 5 *Neoalbaillella*
- 6 *Protoalbaillella*
- 7 *Saturnalbaillella* (syn.)
- 8 *Spinodeflandrella* (syn.)

CERATOIKISCIDAE Holdsworth, 1969

- 9 *Campanulithus*
- 10 *Cangyuanella* (syn.)
- 11 *Ceratoikiscum*
- 12 *Circulaforma*
- 13 *Durahelenifore* (syn.)
- 14 *Eoalbaillella*
- 15 *Gansucercatoikiscum*
- 16 *Glanta*
- 17 *Helenifore*
- 18 *Holoeciscus*
- 19 *Kappaforma*
- 20 *Nazaromistonella* (syn.)
- 21 *Nazarovites*
- 22 *Neoholoeciscus*
- 23 *Paraholoeciscus* (syn.)
- 24 *Proholoeciscus* (n.d.)
- 25 *Protoceratoikiscum*
- 26 *Protoholoeciscus*
- 27 *Raphidociclicus*
- 28 *Xiphachistrella* (syn.)

FOLLICUCULLIDAE Ormiston & Babcock, 1979

- 29 *Cariver* (syn.)
- 30 *Curvalbaillella* (syn.)
- 31 *Follicucullus*
- 32 *Foremanconus* (syn.)
- 33 *Haplodiacanthus* (syn.)
- 34 *Holdsworthella* (syn.)
- 35 *Ishigaconus*
- 36 *Longtanella* (syn.)
- 37 *Parafollicucullus*
- 38 *Praeholdsworthella* (syn.)
- 39 *Pseudoalbaillella* (syn.)

ALBAILLELLARIA incertae sedis

- 40 *Palacantholithus*
- 41 *Xiphocabrium*
- 42 *Xiphocradiella*

ARCHAEOSPICULARIA Dumitrica, Caridroit & De Wever, 2000

ARCHEOENTACTINIIDAE Won & Below, 1999

- 43 *Archeoentactinia*
- 44 *Lithosphaera* (hom.)
- 45 *Pararchoentactinia*
- 46 *Sphaeroentactinia*
- 47 *Spongomassa*

ECHIDNINIDAE Kozur, Mostler & Repetski, 1996

- 48 *Aitchisonellum* (syn.)
- 49 *Altaiesphaera*
- 50 *Archaeocenospaera* (syn.)
- 51 *Cancellisphaera*
- 52 *Curvechidnina*
- 53 *Echidnina*
- 54 *Gigantospiculum*
- 55 *Grosmoreneus*
- 56 *Neoechidnina*
- 57 *Parechidnina*
- 58 *Subechidnina*
- 59 *Varispiculum*
- 60 *Westernbrookia*

PROTOENTACTINIIDAE

Kozur, Mostler & Repetski, 1996

- 61 *Noblella* (hom., syn.)
- 62 *Paulanoblella* (syn.)
- 63 *Protoentactinia*
- 64 *Protospongentactinia*

PALAEOSPICULIDAE Won *in* Won & Below, 1999

- 65 *Neopalaeospiculum*
- 66 *Palaeospiculum*
- 67 *Ramuspiculum*
- 68 *Svalbardospiculum*

SECUCOLLECTIDAE Nazarov & Ormiston, 1984

- 69 *Diparvapila*
- 70 *Palaeosphaera* (syn.)
- 71 *Parasecuicollecta* (syn.)
- 72 *Parvalanapila* (syn.)
- 73 *Pseudorotasphaera*
- 74 *Rotasphaera* (syn.)
- 75 *Secuicollecta*

ENTACTINARIA Kozur & Mostler, 1982

ENTACTINIIDAE Riedel, 1967

- 76 *Afanasievella*
- 77 *Apophysactinia*
- 78 *Apophysisphaera* (syn.)
- 79 *Astroentactinia* (syn.)
- 80 *Belowea* (syn.)
- 81 *Bientactinosphaera* (syn.)
- 82 *Bisphaera* (hom., syn.)
- 83 *Borisella*
- 84 *Callela*

APPENDIX 2. — Continuation.

- | | | | |
|---|------------------------------------|-----|---|
| 85 | <i>Cancellospaera</i> | | |
| 86 | <i>Costaentactinia</i> | | |
| 87 | <i>Cyclocarpus</i> (n.d.) | | |
| 88 | <i>Druppalonche</i> (syn.) | | |
| 89 | <i>Duodecimentactinia</i> | | |
| 90 | <i>Duosphaera</i> (syn.) | | |
| 91 | <i>Entactinia</i> (syn.) | | |
| 92 | <i>Entactinosphaera</i> | | |
| 93 | <i>Gracilentactinia</i> | | |
| 94 | <i>Helioentactinia</i> (n.d.) | | |
| 95 | <i>Holdisphaera</i> | | |
| 96 | <i>Inaequalientactinia</i> (syn.) | | |
| 97 | <i>Involuentactinia</i> | | |
| 98 | <i>Kashiwara</i> | | |
| 99 | <i>Magnentactinia</i> | | |
| 100 | <i>Magnisphaera</i> | | |
| 101 | <i>Meschedea</i> (syn.) | | |
| 102 | <i>Microporosa</i> | | |
| 103 | <i>Moskovistella</i> | | |
| 104 | <i>Multientactinia</i> | | |
| 105 | <i>Munzuwonella</i> | | |
| 106 | <i>Ornatoentactinia</i> (syn.) | | |
| 107 | <i>Palaeopentactinorbis</i> (syn.) | | |
| 108 | <i>Palaeoxyphostylus</i> (syn.) | | |
| 109 | <i>Paleoxiphosphaera</i> (n.d.) | | |
| 110 | <i>Paratriposphaera</i> | | |
| 111 | <i>Perforentactinia</i> | | |
| 112 | <i>Plenoentactinia</i> | | |
| 113 | <i>Plenosphaera</i> | | |
| 114 | <i>Pluristratoentactinia</i> | | |
| 115 | <i>Polyedroentactinia</i> | | |
| 116 | <i>Provisocyntra</i> | | |
| 117 | <i>Radiobisphaera</i> | | |
| 118 | <i>Retentactinia</i> | | |
| 119 | <i>Retisphaera</i> | | |
| 120 | <i>Sinosphaera</i> | | |
| 121 | <i>Spongentactinia</i> | | |
| 122 | <i>Spongospaera</i> (hom.) | | |
| 123 | <i>Staurodruppa</i> (syn.) | | |
| 124 | <i>Stigmosphaerostylus</i> | | |
| 125 | <i>Stolbergia</i> (syn.) | | |
| 126 | <i>Thecentactinia</i> (syn.) | | |
| 127 | <i>Trilonche</i> | | |
| 128 | <i>Uberinterna</i> | | |
| 129 | <i>Wonella</i> (hom.) | | |
| 130 | <i>Wuyia</i> | | |
| HAPLENTACTINIIDAE Nazarov <i>in</i> Nazarov & Popov, 1980 | | | |
| 131 | <i>Arcoclathrata</i> | | |
| 132 | <i>Arrhiniella</i> (syn.) | | |
| 133 | <i>Bissylentactinia</i> | | |
| 134 | <i>Haplentactinia</i> | | |
| 135 | <i>Syntagentactinia</i> | | |
| | | | PALAEOLITHOCYCLIIDAE Kozur & Mostler, 1989 |
| | | 136 | <i>Eostylodictya</i> (syn.) |
| | | 137 | <i>Gedauiia</i> (syn.) |
| | | 138 | <i>Palaeoastrocyclia</i> (syn.) |
| | | 139 | <i>Palaeolithocyclia</i> |
| | | 140 | <i>Paramphibrachium</i> |
| | | 141 | <i>Sphaerodiscus</i> (syn.) |
| | | | PALAEOSCENIDIIDAE Riedel, 1967 |
| | | 142 | <i>Deflantrica</i> |
| | | 143 | <i>Fukujius</i> (n.d.) |
| | | 144 | <i>Goodbodium</i> (syn.) |
| | | 145 | <i>Holdsworthum</i> |
| | | 146 | <i>Insolitignum</i> |
| | | 147 | <i>Pactarentinia</i> |
| | | 148 | <i>Palaeodecaradium</i> |
| | | 149 | <i>Palaeoephippium</i> |
| | | 150 | <i>Palaeopyramidium</i> |
| | | 151 | <i>Palaeoscenidium</i> |
| | | 152 | <i>Palaeothalomnus</i> |
| | | 153 | <i>Palaeotrifidus</i> (syn.) |
| | | 154 | <i>Palaeotripus</i> (syn.) |
| | | 155 | <i>Palaeoumbaculum</i> (syn.) |
| | | 156 | <i>Praesaturnalis</i> |
| | | 157 | <i>Procyrtis</i> |
| | | 158 | <i>Tetraedroclathrum</i> (n.n.) |
| | | 159 | <i>Tlecerina</i> |
| | | | PYLENTONEMIDAE Deflandre, 1963 |
| | | 160 | <i>Pylentonema</i> |
| | | 161 | <i>Polyentactinia</i> |
| | | 162 | <i>Quadrapesus</i> |
| | | | TETRENTACTINIIDAE Kozur & Mostler, 1979 |
| | | 163 | <i>Ellipsostigma</i> (n.d.) |
| | | 164 | <i>Multisphaera</i> |
| | | 165 | <i>Somphoentactinia</i> (syn.) |
| | | 166 | <i>Spongentactinella</i> (syn.) |
| | | 167 | <i>Tetrentactinia</i> |
| | | 168 | <i>Trienosphaera</i> |
| | | 169 | <i>Trienoentactinosphaera</i> (syn.) |
| | | | LATENTIFISTULARIA Caridroit, De Wever & Dumitrica, 1999 |
| | | | CAULETELLIDAE Caridroit, De Wever & Dumitrica, 1999 |
| | | 170 | <i>Cauletella</i> |
| | | 171 | <i>Deflandrella</i> (hom.) |
| | | 172 | <i>Foremanhelenia</i> |
| | | 173 | <i>Ishigaum</i> |
| | | 174 | <i>Kimagior</i> (syn.) |
| | | 175 | <i>Praedeflandrella</i> |
| | | 176 | <i>Pseudotormentus</i> |
| | | 177 | <i>Shangella</i> |
| | | 178 | <i>Triactofenestrella</i> (syn.) |
| | | 179 | <i>Trifidospongos</i> (syn.) |
| | | 180 | <i>Triplanospongos</i> |

APPENDIX 2. — Continuation.

LATENTIFISTULIDAE Nazarov & Ormiston, 1983

- 181 *Areolicaudatus*
- 182 *Brianellium*
- 183 *Latentibifistula*
- 184 *Latentifistula*
- 185 *Ouaka* (syn.)
- 186 *Staurentactinia*
- 187 *Trilacertus* (syn.)
- 188 *Wonella* (syn.)

ORMISTONELLIDAE De Wever & Caridroit, 1984
sensu Dumitrica *in* De Wever *et al.* (2001)

- 189 *Cornellus* (syn.)
- 190 *Haploaxon*
- 191 *Nabespecha* (syn.)
- 192 *Nazarovella* (hom., syn.)
- 193 *Ormistonella*
- 194 *Paulianella* (syn.)
- 195 *Polyfistula*
- 196 *Quadricaulis*
- 197 *Quadriremis* (syn.)
- 198 *Quinqueremis*
- 199 *Raciditor* (syn.)

PSEUDOLITHELIIDAE

Kozur & Mostler, 1989 *sensu* De Wever *et al.* (2001)

- 200 *Grandetortura*
- 201 *Octatortementum*
- 202 *Pseudolithelius* (syn.)

TETRATORMENTIDAE Nestell & Nestell, 2010

- 203 *Archaeopyramisa* (syn.)
- 204 *Mostlerispongus*
- 205 *Quadrilobata*
- 206 *Tetracircinata* (syn.)
- 207 *Tetragegnon*
- 208 *Tetraspongoactinia* (syn.)
- 209 *Tetratormentum*

RUZHENCEVISPONGIDAE Kozur, 1980

- 210 *Latentidiota*
- 211 *Nazarovispongus* (syn.)
- 212 *Patrickella* (syn.)
- 213 *Rectotortementum*
- 214 *Ruzhencevispongus*
- 215 *Scharfenbergia* (hom.)
- 216 *Tortementum*
- 217 *Wonia*

?NASSELLARIA Ehrenberg, 1876

ARCHOCYRTIIDAE Kozur & Mostler, 1981 emend.
Cheng (1986)

- 218 *Allocyrtium* (syn.)
- 219 *Archocyrtium*
- 220 *Cerarchocyrtium*
- 221 *Ceratoclathrum* (n.n.)

- 222 *Cyrtisphaeractenium*
- 223 *Cyrtisphaeronemium*
- 224 *Deflandrellium*
- 225 *Foremaniella*
- 226 *Mostlerium* (syn.)
- 227 *Pararchocyrtium*
- 228 *Robotium* (syn.)

POPOFSKYELLIDAE Kozur & Mostler, 1981 emend.
Cheng (1986)

- 229 *Cyrtentactinia*
- 230 *Kantollum*
- 231 *Popofskyellum*
- 232 *Totollum*
- 233 *Tuscaritellum*

SPUMELLARIA Ehrenberg, 1876

ANTYGOPORIDAE Maletz & Bruton, 2007

- 234 *Antygopora*
- 235 *Beothuka*
- 236 *Labyrinthia* (syn.)
- 237 *Parabeothuka*

COPICYNTRIDAE Kozur & Mostler, 1989

- 238 *Bipylospongia*
- 239 *Copicyntra*
- 240 *Copicyntroides*
- 241 *Copiellintra*
- 242 *Devoniglansus*
- 243 *Ellipsocopicyntra* (syn.)
- 244 *Klaengspongos*
- 245 *Paracopicyntra*
- 246 *Paurinella*
- 247 *Spongosphaeradiscus* (syn.)
- 248 *Tamonella*
- 249 *Tetrapaurinella*

HAPLOTAENIATIDAE Won, Blodgett & Nestor, 2002

- 250 *Gyrosphaera*
- 251 *Haplotaeniatum*
- 252 *Labyrinthosphaera*
- 253 *Orbiculopylorum*

INANIGUTTIDAE Nazarov & Ormiston, 1984 *sensu*
Danelian & Popov (2003)

- 254 *Aciferopylorum* (syn.)
- 255 *Cessipylarum* (syn.)
- 256 *Cessipylorum* (syn.)
- 257 *Fusalfanus*
- 258 *Futobari*
- 259 *Helminentactinia* (syn.)
- 260 *Inanibigutta*
- 261 *Inanigutta*
- 262 *Inanihella*
- 263 *Kalimnasphaera*
- 264 *Oriundogutta*

APPENDIX 2. — Continuation.

- 265 *Plussatispila*
- 266 *Triplococcus*
- 267 *Zadrappolus*

SPUMELLARIA INCERTAE SEDIS

- 268 *Franklinia* (hom.)
- 269 *Haplopolus* (syn.)
- 270 *Hegleria*
- 271 *Intracarpus*
- 272 *Maletzella*
- 273 *Pseudospongoprimum*
- 274 *Quasibeothuka* (n.d.)
- 275 *Zhuangodiscus*

ORDER INCERTAE SEDIS

CORYTHOECIDAE Nazarov *in* Nazarov & Rudenko, 1981

- 276 *Arrectoalatus*
- 277 *Camptoalatus*
- 278 *Cornum*
- 279 *Corythoecia*

PROVENTOCITIDAE Aitchison, 1998

- 280 *Archeoproventocitum*
- 281 *Cowheadia*
- 282 *Protoproventocitum*
- 283 *Proventocitum*

ASPICULIDAE Won, Iams & Reed, 2005

- 284 *Aspiculum*
- 285 *Cavasphaera*
- 286 *Neoaspiculum*
- 287 *Nyfrieslandia*
- 288 *Sanctipaulelum*

ORDER & FAMILY INCERTAE SEDIS

- 289 *Adamas* (hom.)
- 290 *Adamasirad*
- 291 *Cancellientactinia*
- 292 *Caspiaza*
- 293 *Copiconulus*
- 294 *Etymalbaillella*
- 295 *Fungomacula*
- 296 *Lithocannosphaeropsis*
- 297 *Megaporus*
- 298 *Novormistonina*
- 299 *Ormistonina* (hom.)
- 300 *Palaeoactinosphaera*
- 301 *Praespongocoelia*

- 302 *Protobiramus*
- 303 *Retientactinosphaera*
- 304 *Russirad*
- 305 *Stylactinosphaera*
- 306 *Trigonosphaera*

NOMINA DUBIA

- 307 *Carposphaeridium* (n.d.)
- 308 *Diploplegma* (n.d.)
- 309 *Dorydictyum* (n.d.)
- 310 *Doryplegma* (n.d.)
- 311 *Dorysphaera* (n.d.)
- 312 *Duplexia* (n.d.)
- 313 *Ectoactinia* (n.d.)
- 314 *Ehrenbergia* (n.d.)
- 315 *Guangxitrisphaera* (n.d.)
- 316 *Gustefana* (n.d.)
- 317 *Induropilarius* (n.d.)
- 318 *Palaeolithochytris* (n.d.)
- 319 *Palamphimorphium* (n.d.)
- 320 *Paleocenosphaera* (n.d.)
- 321 *Palhindeolithus* (n.d.)
- 322 *Papinochium* (n.d.)
- 323 *Primaritripus* (n.d.)
- 324 *Protosegmentum* (n.d.)
- 325 *Pseudostigmatosphaera* (n.d.)
- 326 *Spongocoelia* (n.d.)
- 327 *Srakaesphaera* (n.d.)
- 328 *Stauroplegma* (n.d.)
- 329 *Tetrasphaera* (n.d.)
- 330 *Triplosphaera* (n.d.)
- 331 *Ulcundia* (n.d.)
- 332 *Wangia* (n.d.)
- 333 *Palaeodiscaleksus* (n.d.)
- 334 *Palaeodiscus* (n.d.)

NOT RADIOLARIA

- 335 *Anakrusa*
- 336 *Auliela*
- 337 *Azyrtalia*
- 338 *Batoballa*
- 339 *Eoconcharium*
- 340 *Fusuconcharium*
- 341 *Konyrium*
- 342 *Lacisus*
- 343 *Palaeorubus*
- 344 *Quadratapora*

APPENDIX 3. — Illustrated catalogue of Paleozoic radiolarian genera.

AI
001

Albaillella
Deflandre, 1952: 873
Albaillellidae



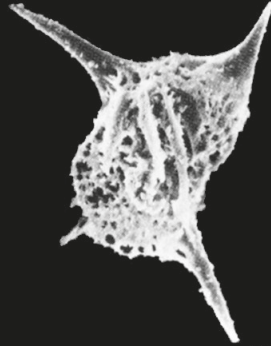
100 µm

Albaillella paradoxa
Deflandre, 1952: 873, fig. 1

AI
002

Huasha
Cheng, 1986: 71
Albaillellidae

SYN.



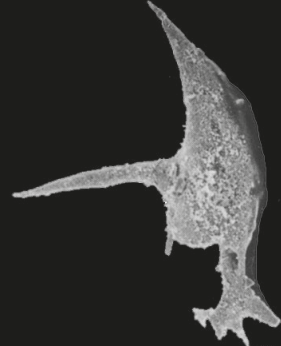
100 µm

Huasha holdsworthi
Cheng, 1986: 73, pl. 2, fig. 1
SEE LAPIDOPISCUM

AI
003

Imotoella
Kozur & Mostler, 1989: 163
Albaillellidae

SYN.

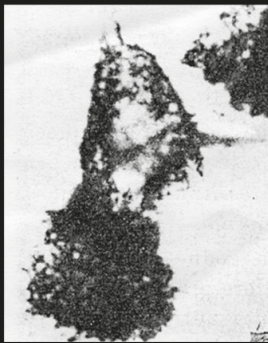


100 µm

Albaillella levis
Ishiga, Kito & Imoto, 1982a: 17, pl. 3, fig. 1
SEE ALBAILLELLA

AI
004

Lapidopiscum
Deflandre, 1958: 2280
Albaillellidae



100 µm

Lapidopiscum piveteaui
Deflandre, 1958: 2278, fig. 2

AI
005

Neoalbaillella
Takemura & Nakaseko, 1981: 210
Albaillellidae



100 µm

Neoalbaillella ornithoformis
Takemura & Nakaseko, 1981: 211, pl. 33, fig. 1

AI
006

Protoalbaillella
Cheng, 1986: 67
Albaillellidae



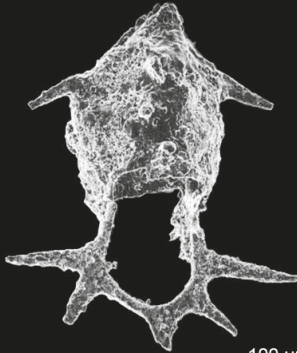
100 µm

Protoalbaillella deflandrei
Cheng, 1986: 68, pl. 6, fig. 1

AI
007

Saturnalbaillella
Kozur & Mostler, 1989: 162
Albaillellidae

SYN.



100 µm

Albaillella cartalla
Ormiston & Lane, 1976: 171, pl. 5, fig. 10
SEE ALBAILLELLA

AI
008

Spinodeflandrella
Kozur, 1981: 267
Albaillellidae

SYN.



100 µm

Spinodeflandrella tetraspinosa
Kozur, 1981: 267, pl. 2, fig. 1
SEE ALBAILLELLA

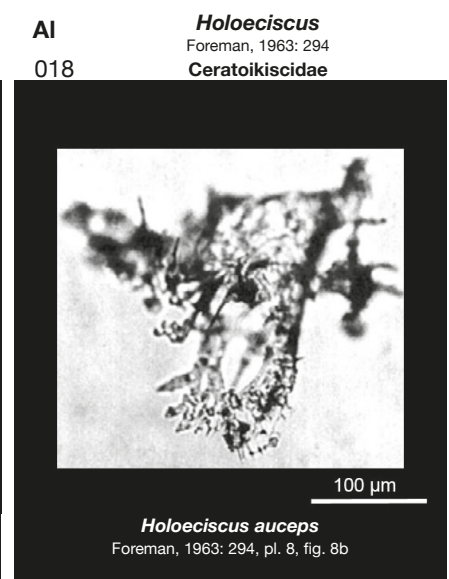
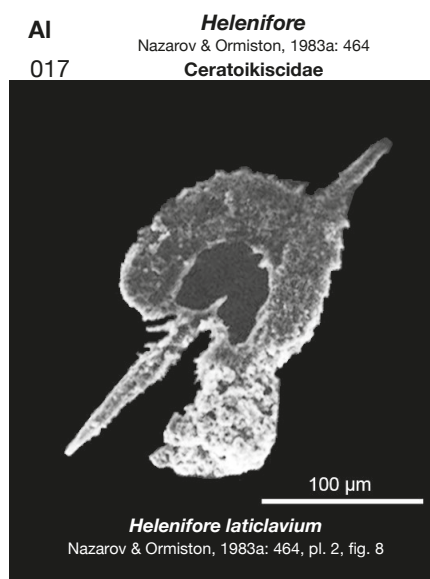
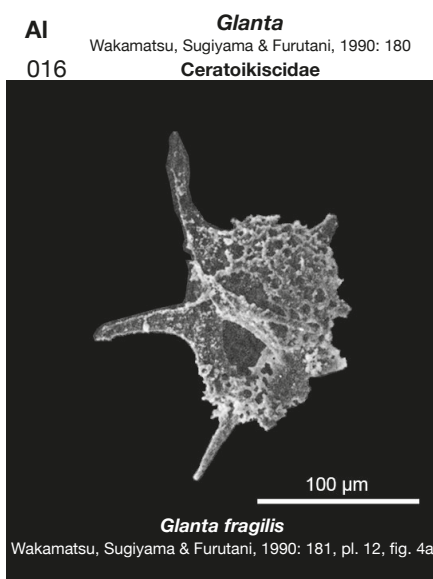
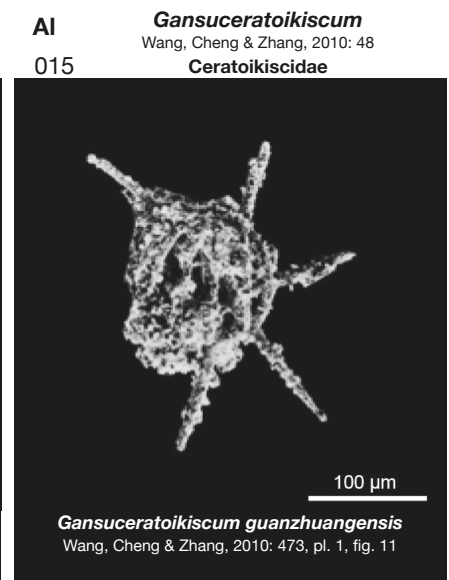
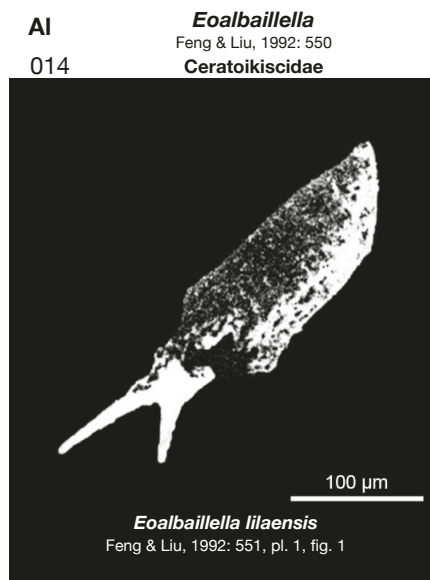
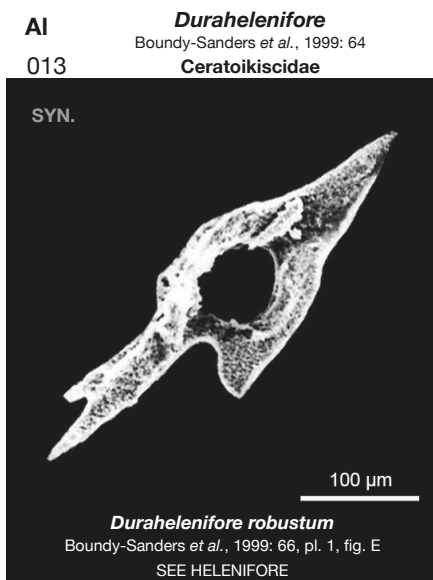
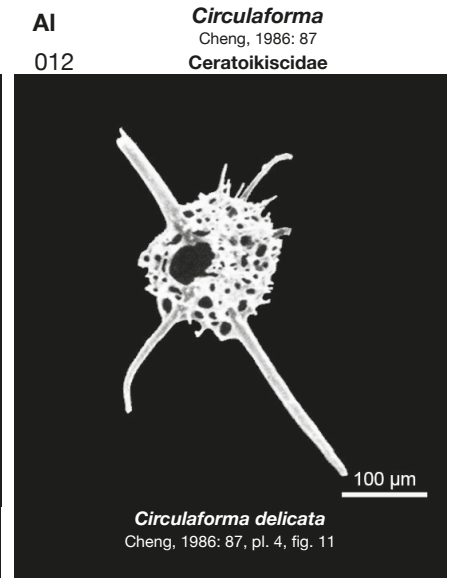
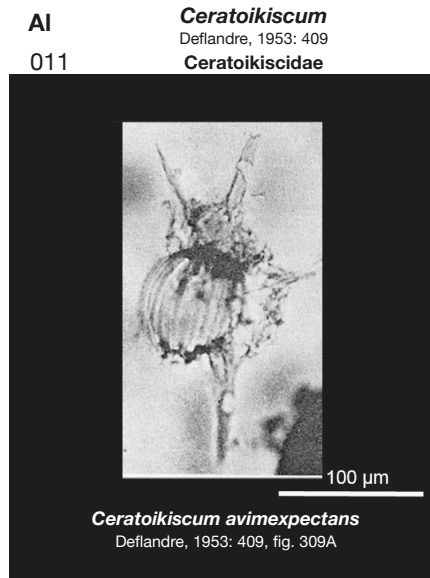
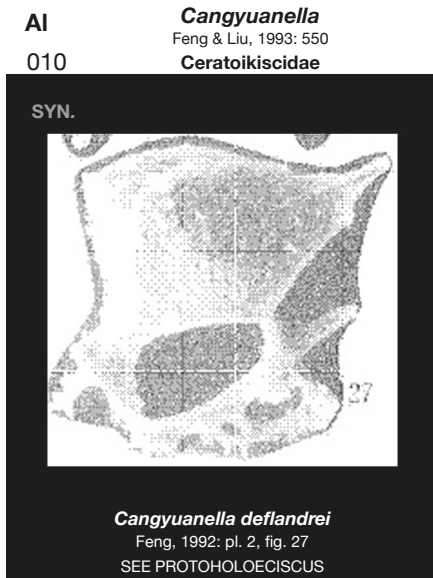
AI
009

Campanulithus
Nazarov & Rudenko, 1981: 137
Ceratoikiscidae



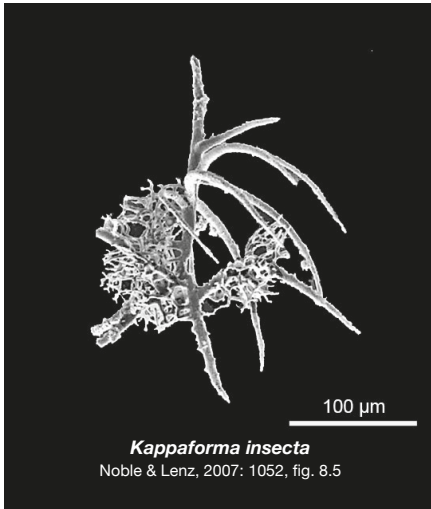
100 µm

Campanulithus falcatus
Nazarov & Rudenko, 1981: 137, pl. 1, fig. 8



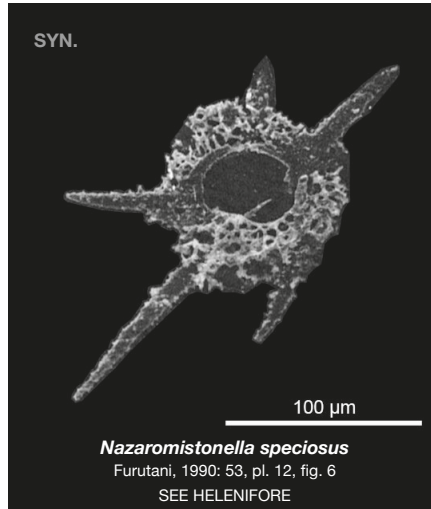
AI
019

Kappaforma
Noble & Lenz, 2007: 1050
Ceratoikiscidae



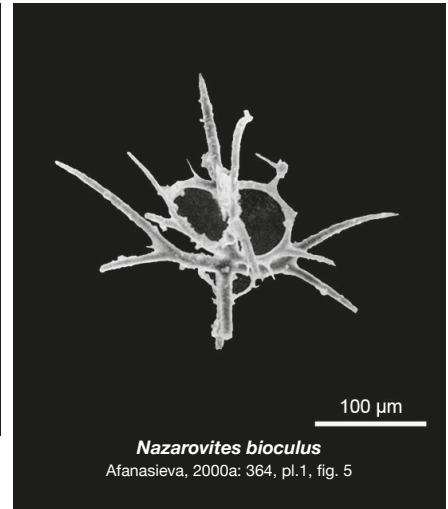
AI
020

Nazaromistonella
Furutani, 1990: 52
Ceratoikiscidae



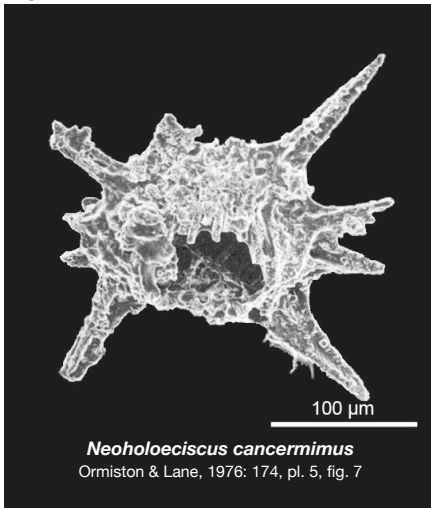
AI
021

Nazarovites
Afanasieva, 2000a: 360
Ceratoikiscidae



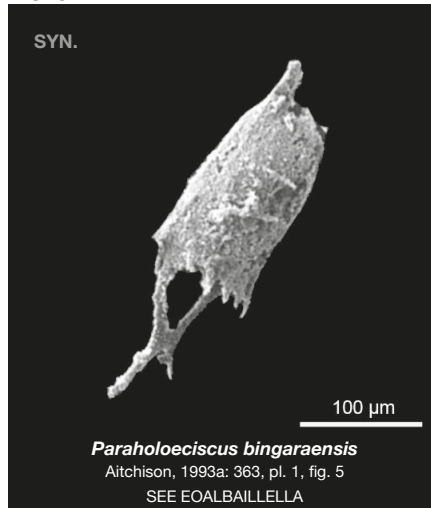
AI
022

Neoholoeciscus
Ormiston & Lane, 1976: 173
Ceratoikiscidae



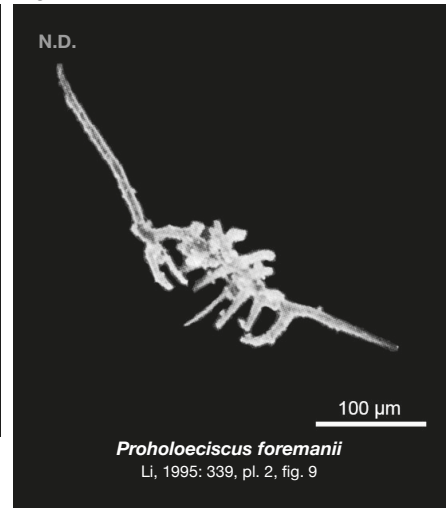
AI
023

Paraholoeciscus
Aitchison, 1993a: 363
Ceratoikiscidae



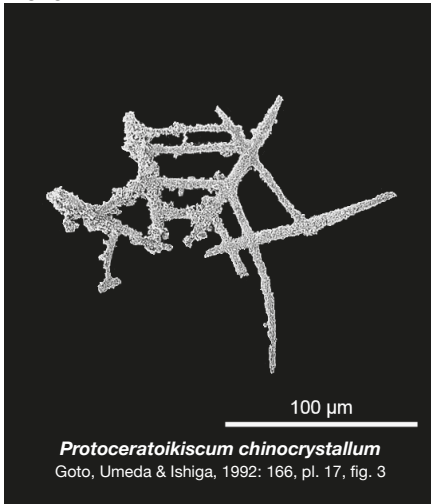
AI
024

Proholoeciscus
Li, 1995: 338
Ceratoikiscidae



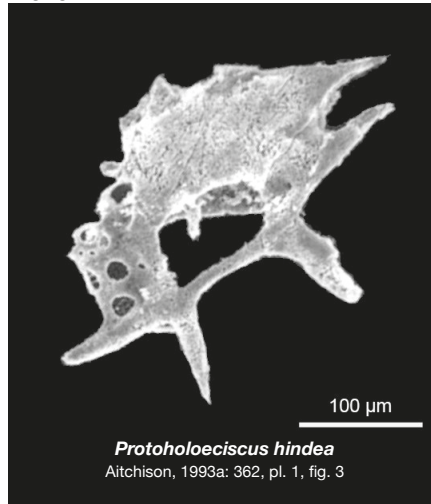
AI
025

Protoceratoikiscum
Goto, Umeda & Ishiga, 1992: 165
Ceratoikiscidae



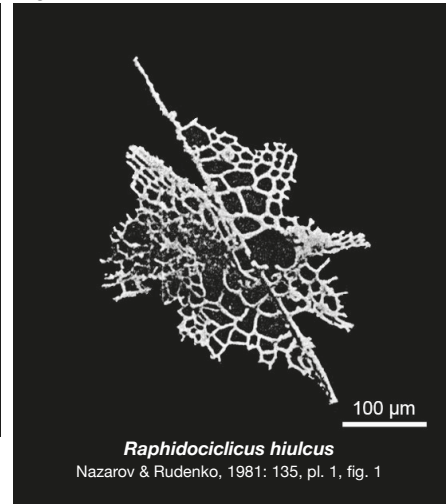
AI
026

Protoholoeciscus
Aitchison, 1993a: 362
Ceratoikiscidae



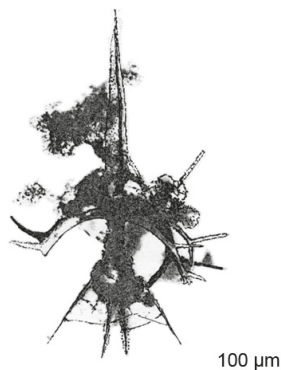
AI
027

Raphidociclicus
Nazarov & Rudenko, 1981: 135
Ceratoikiscidae



AI
028
SYN.

Xiphachistrella
Deflandre, 1973b: 499
Ceratoikiscidae

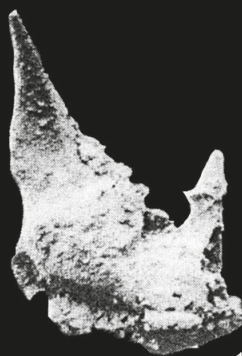


100 µm

Xiphachistrella acipensis
Deflandre, 1973a: 292, pl. 4, fig. 4
SEE CERATOIKISCUM

AI
029
SYN.

Cariver
Kozur, 1993: 108
Follicucullidae

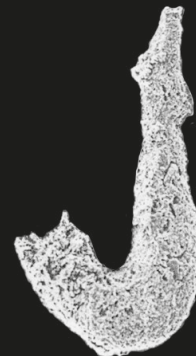


100 µm

Follicucullus orthogonus
Caridroit & De Wever, 1984: 642, pl. 1, fig. 28
SEE FOLLICUCULLUS

AI
030
SYN.

Curvalbaillella
Kozur & Mostler, 1989: 179
Follicucullidae



100 µm

Pseudoalbaillella U-forma
Holdsworth & Jones, 1980: 285, app. fig. 1C
SEE PARAFOLLICUCULLUS

AI
031
SYN.

Follicucullus
Ormiston & Babcock, 1979: 332
Follicucullidae

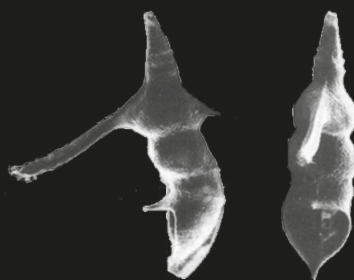


100 µm

Follicucullus ventricosus
Ormiston & Babcock, 1979: 332, pl. 1, fig. 7

AI
032
SYN.

Foremanconus
Kozur & Mostler, 1989: 180
Follicucullidae



100 µm

Parafollicucullus sakmarensis
Kozur, 1981: 266, pl. 1, fig. 1
SEE PARAFOLLICUCULLUS

AI
033
SYN.

Haplodiacanthus
Nazarov & Rudenko, 1981: 133
Follicucullidae

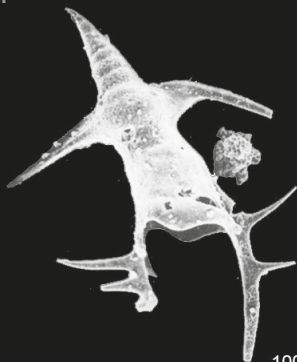


100 µm

Haplodiacanthus anfractus
Nazarov & Rudenko, 1981: 133, pl. 1, fig. 5
SEE PARAFOLLICUCULLUS

AI
034
SYN.

Holdsworthella
Kozur, 1981: 268
Follicucullidae



100 µm

Holdsworthella permica
Kozur, 1981: 268, pl. 3, fig. 2
SEE PARAFOLLICUCULLUS

AI
035
SYN.

Ishigaconus
Kozur & Mostler, 1989: 181
Follicucullidae

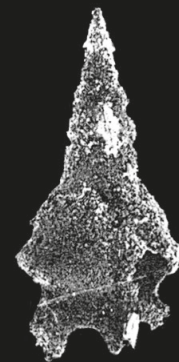


100 µm

Follicucullus scholasticus
Ormiston & Babcock, 1979: 333, pl. 1, fig. 1

AI
036
SYN.

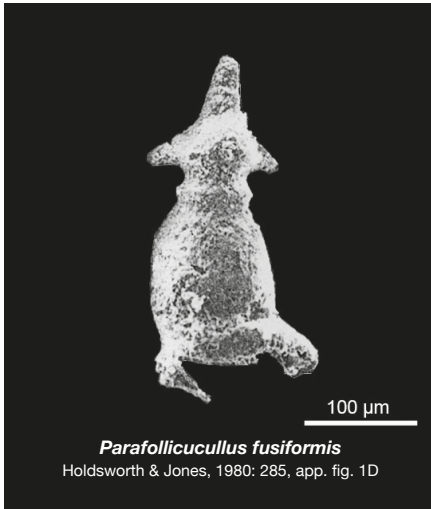
Longtanella
Sheng & Wang, 1985: 179
Follicucullidae



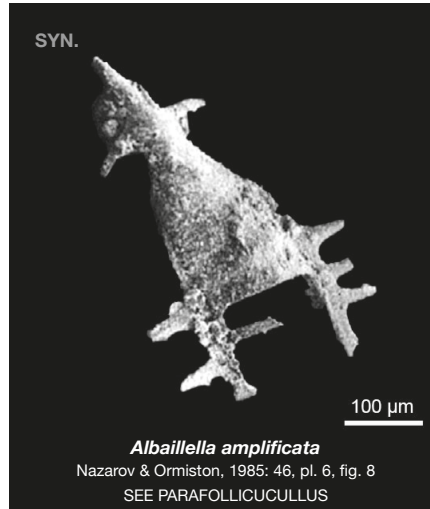
100 µm

Longtanella zhengpanshanensis
Sheng & Wang, 1985: 179, pl. 3, fig. 11
SEE PARAFOLLICUCULLUS

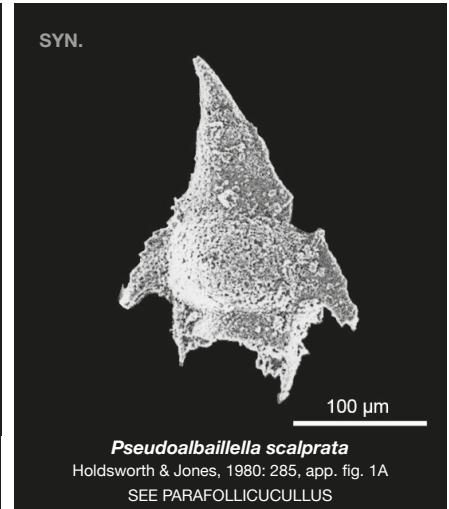
AI
037
Parafollicucullus
Holdsworth & Jones, 1980: 285
Follicucullidae



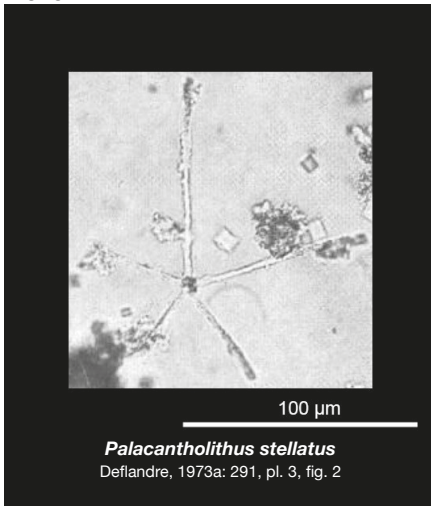
AI
038
Praeholdsworthella
Kozur & Mostler, 1989: 184
Follicucullidae



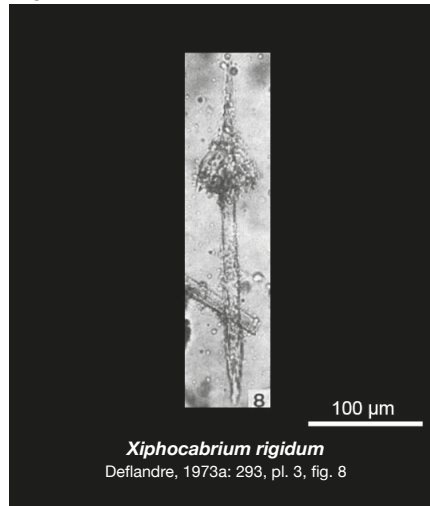
AI
039
Pseudoalbaillella
Holdsworth & Jones, 1980: 285
Follicucullidae



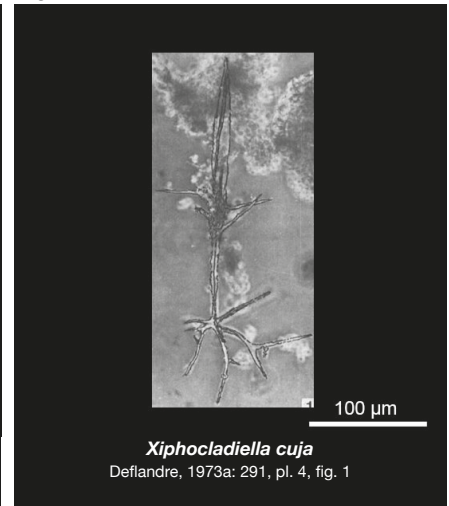
AI
040
Palacantholithus
Deflandre, 1973b: 499
Albaillellaria incertae sedis



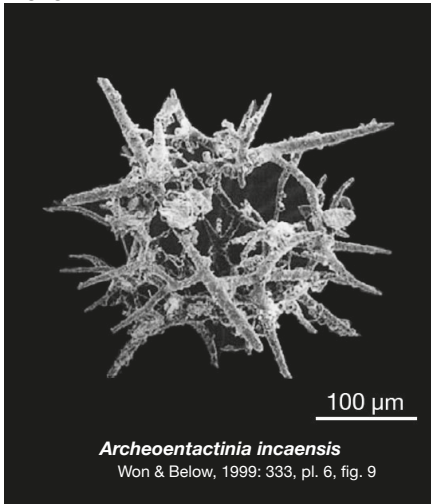
AI
041
Xiphocabrium
Deflandre, 1973b: 500
Albaillellaria incertae sedis



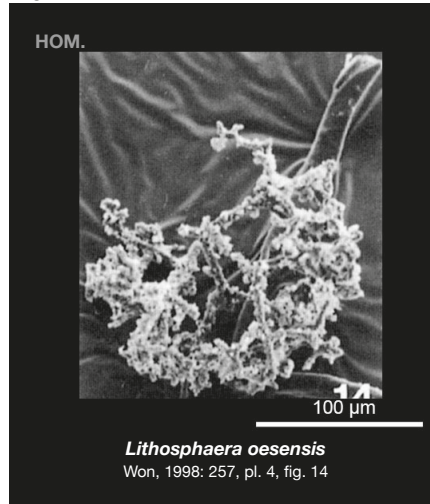
AI
042
Xiphocradiella
Deflandre, 1973b: 499
Albaillellaria incertae sedis



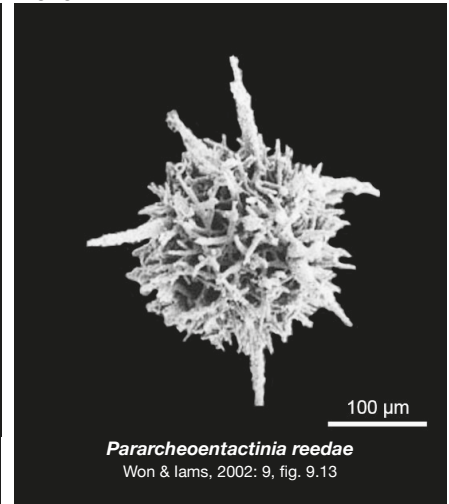
Ar
043
Archeoentactinia
Won in Won & Below, 1999: 332
Archeoentactiniidae



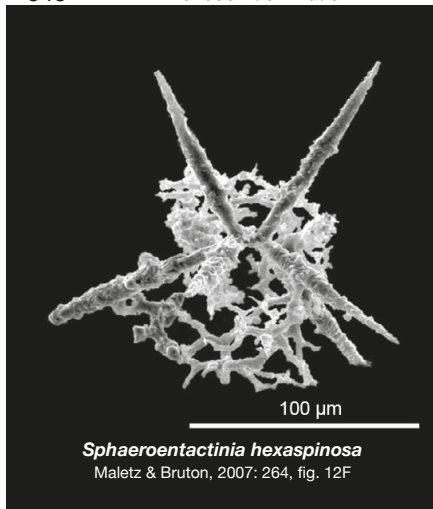
Ar
044
Lithosphaera
Won, 1998: 256
Archeoentactiniidae



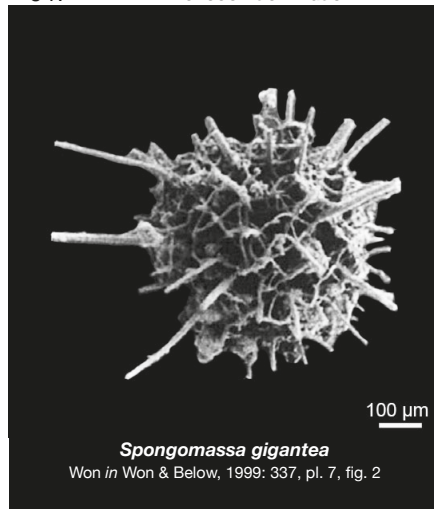
Ar
045
Pararchoentactinia
Won & Iams, 2002: 9
Archeoentactiniidae



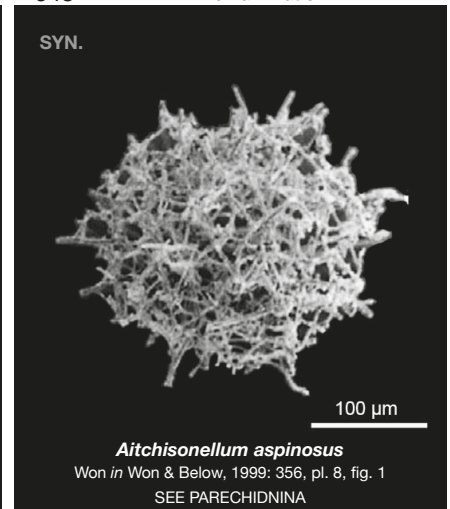
Ar
046
Sphaeroentactinia
Maletz & Bruton, 2007: 263
Archeoentactiniidae



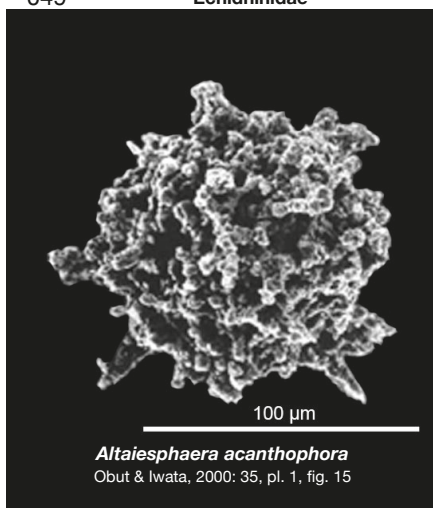
Ar
047
Spongomassa
Won in Won & Below, 1999: 337
Archeoentactiniidae



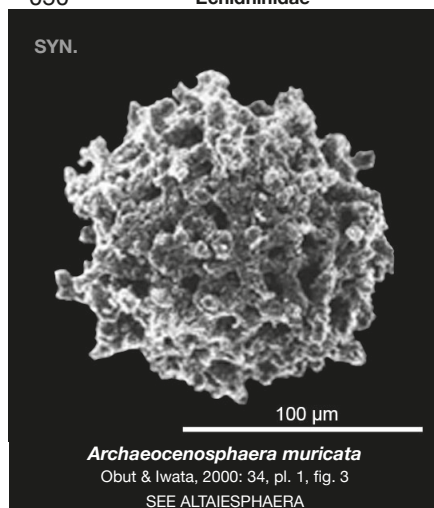
Ar
048
Aitchisonellum
Won in Won & Below, 1999: 352
Echininidae



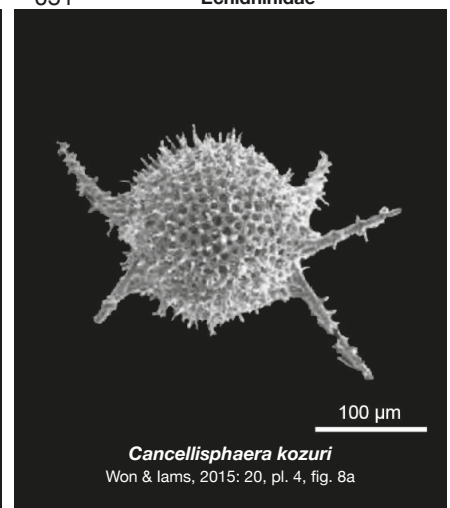
Ar
049
Altaesphaera
Obut & Iwata, 2000: 34
Echininidae



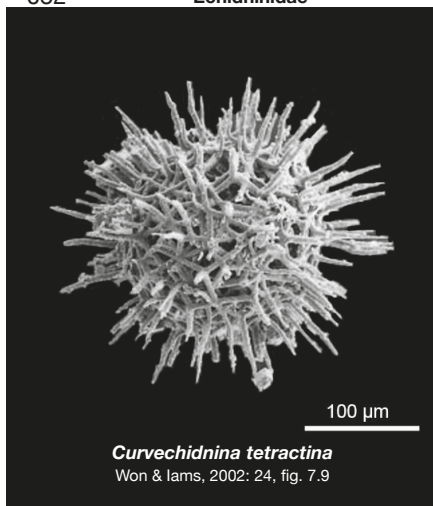
Ar
050
Archaeocenosphaera
Obut & Iwata, 2000: 33
Echininidae



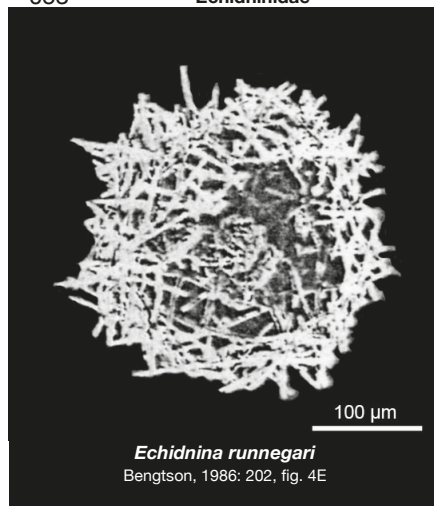
Ar
051
Cancellisphaera
Won & Iams, 2015: 19
Echininidae



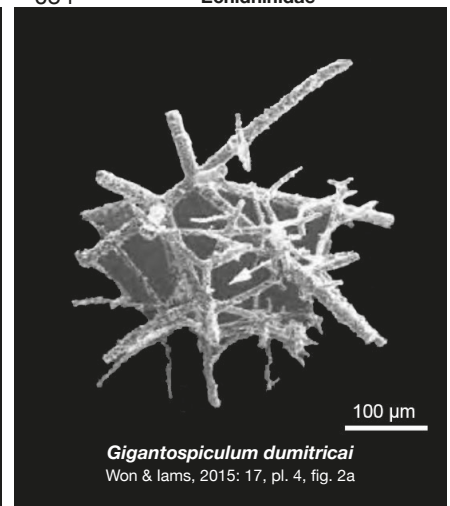
Ar
052
Curvechidnina
Won & Iams, 2002: 23
Echininidae



Ar
053
Echidnina
Bengtson, 1986: 202
Echininidae

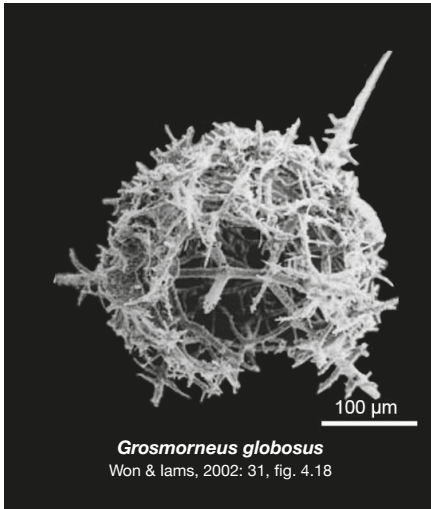


Ar
054
Gigantospiculum
Won & Iams, 2015: 16
Echininidae



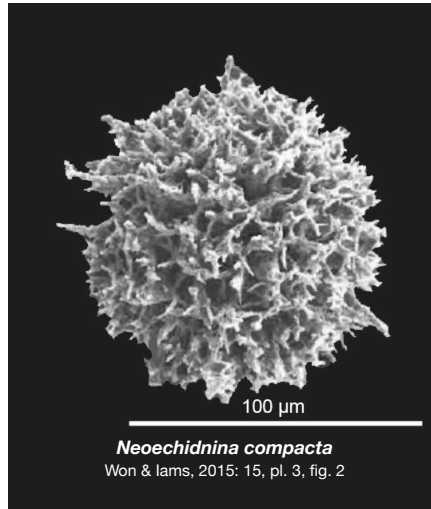
Ar
055

Grosmorneus
Won & Iams, 2002: 31
Echidniniidae



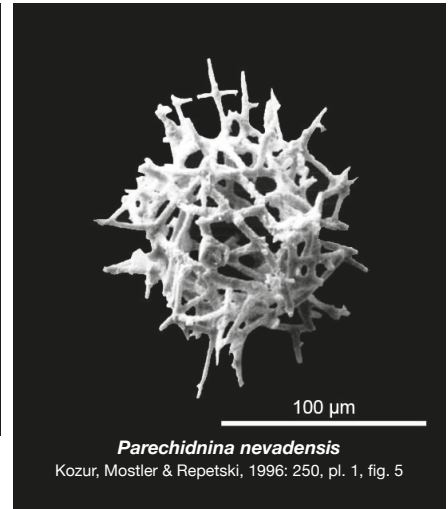
Ar
056

Neoechidnina
Won & Iams, 2015: 15
Echidniniidae



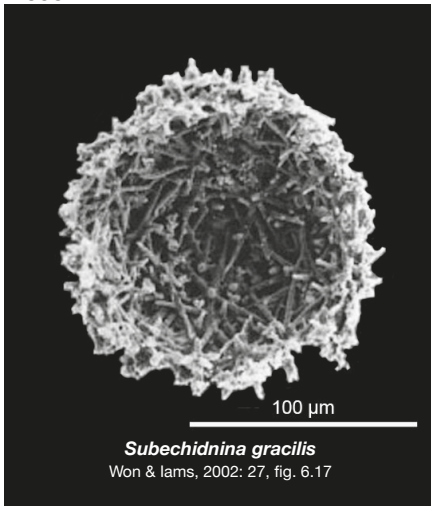
Ar
057

Parechidnina
Kozur, Mostler & Repetski, 1996: 249
Echidniniidae



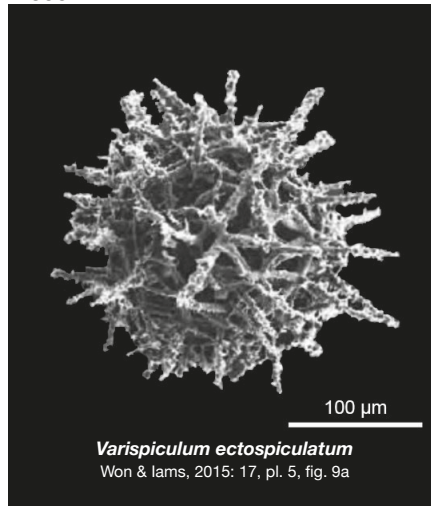
Ar
058

Subechidnina
Won & Iams, 2002: 26
Echidniniidae



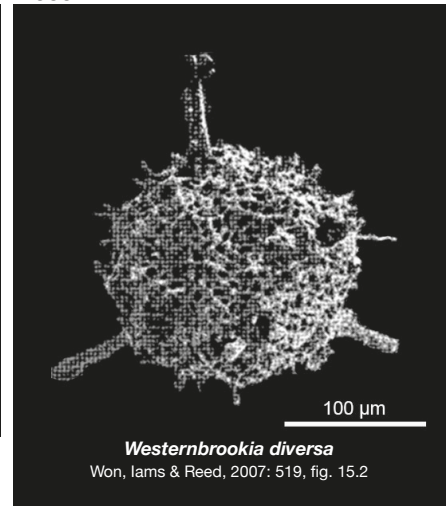
Ar
059

Varispiculum
Won & Iams, 2015: 17
Echidniniidae



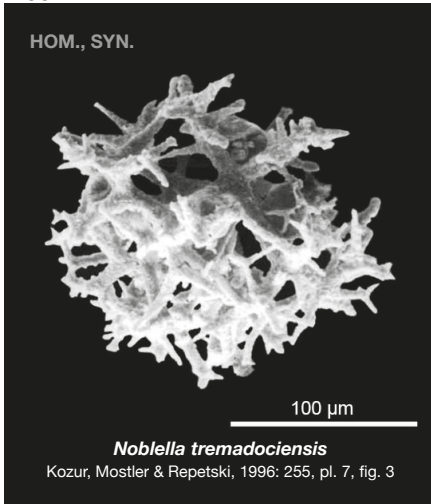
Ar
060

Westernbrookia
Won, Iams & Reed, 2007: 517
Echidniniidae



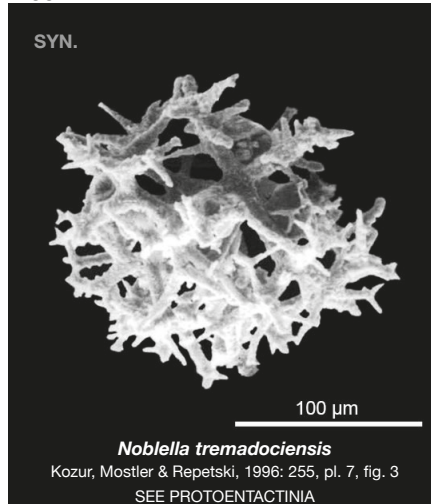
Ar
061

Noblella
Kozur, Mostler & Repetski, 1996: 255
Protoentactiniidae



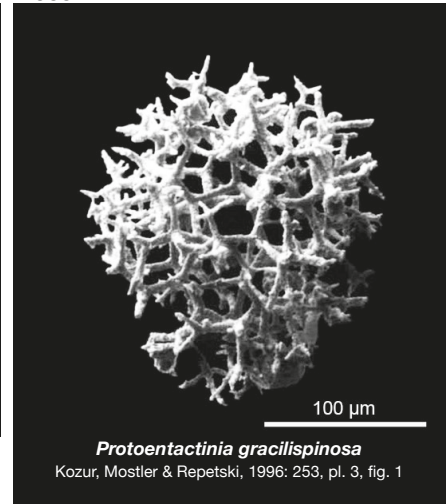
Ar
062

Paulanoblella
Kozur & Repetski, 2002: 28
Protoentactiniidae

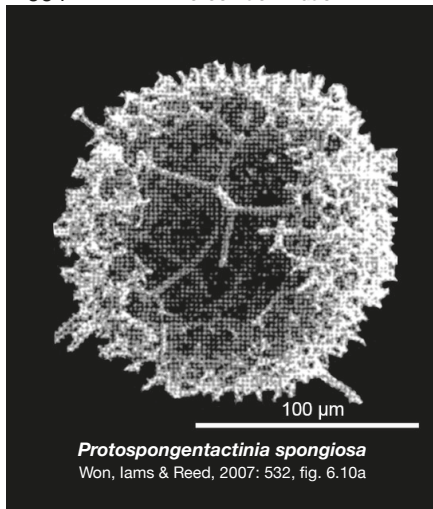


Ar
063

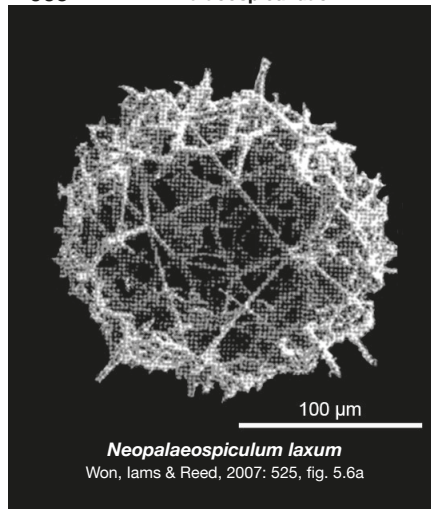
Protoentactinia
Kozur, Mostler & Repetski, 1996: 253
Protoentactiniidae



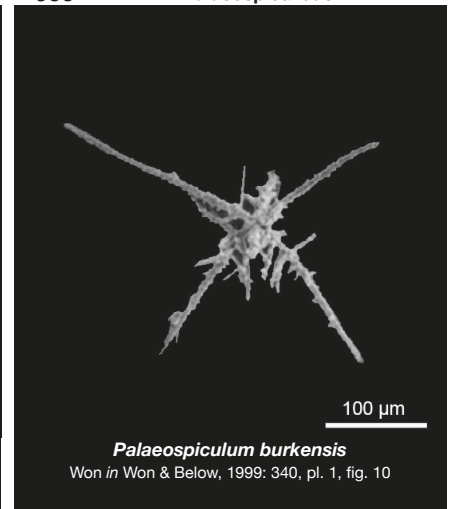
Ar
064
Protospongectinia
Won, Iams & Reed, 2007: 531
Protoentactiniidae



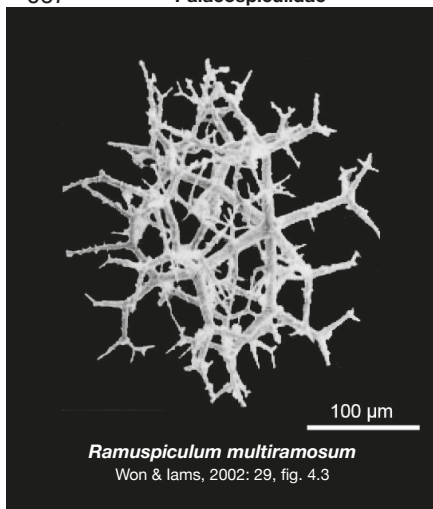
Ar
065
Neopalaeospiculum
Won, Iams & Reed, 2007: 525
Palaeospiculidae



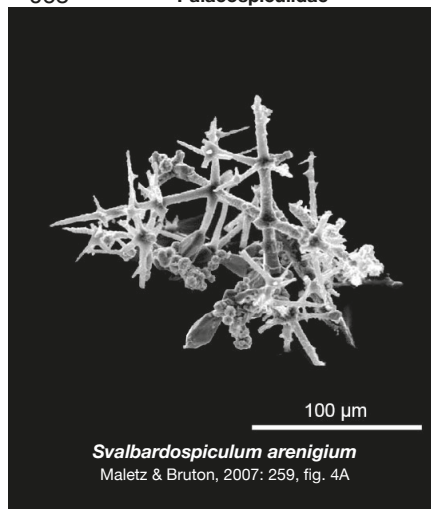
Ar
066
Palaeospiculum
Won in Won & Below, 1999: 339
Palaeospiculidae



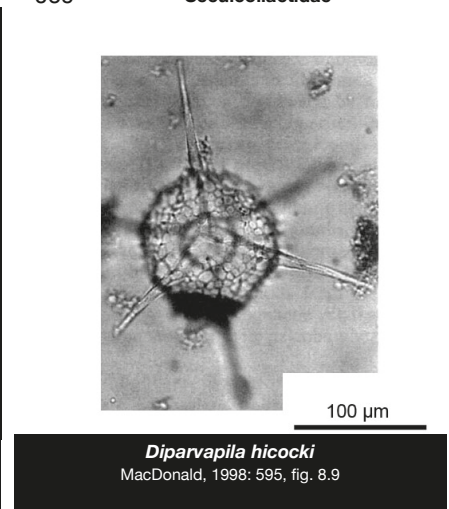
Ar
067
Ramuspiculum
Won & Iams, 2002: 29
Palaeospiculidae



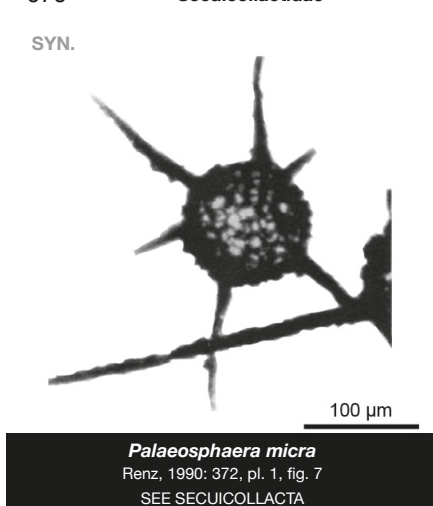
Ar
068
Svalbardospiculum
Maletz & Bruton, 2007: 259
Palaeospiculidae



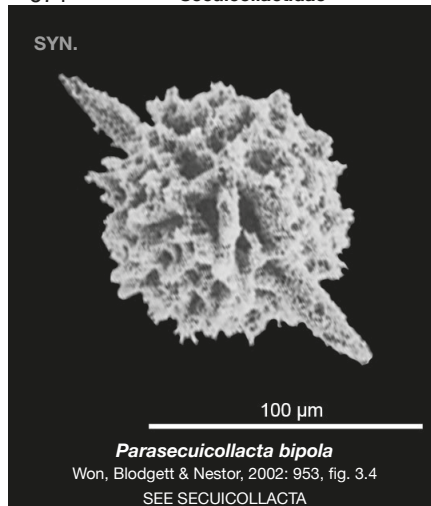
Ar
069
Diparvapila
MacDonald, 1998: 594
Secuicollactidae



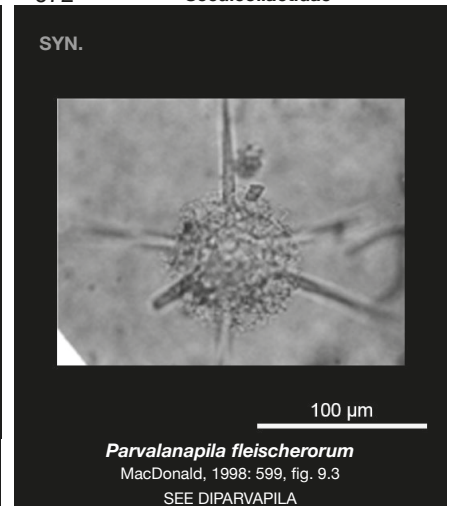
Ar
070
Palaeosphaera
Renz, 1990: 372
Secuicollactidae

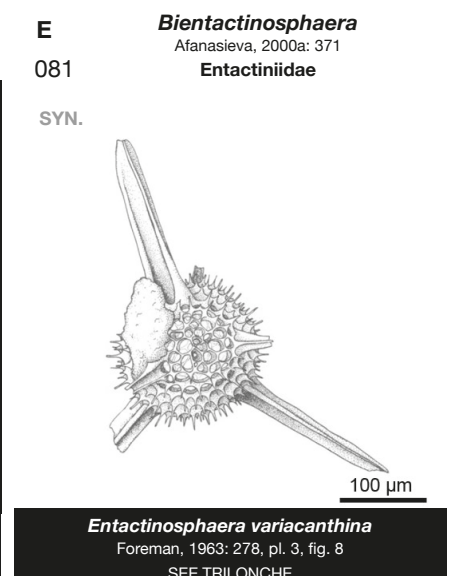
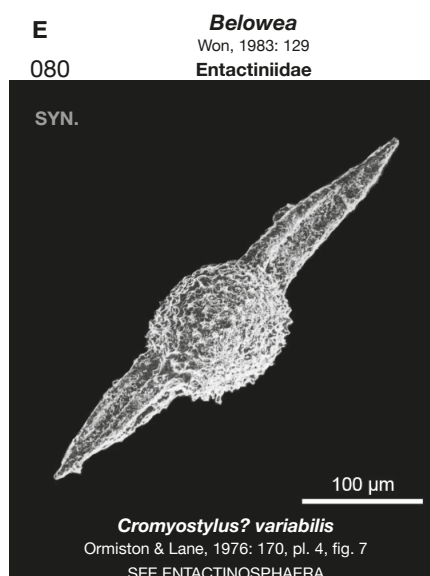
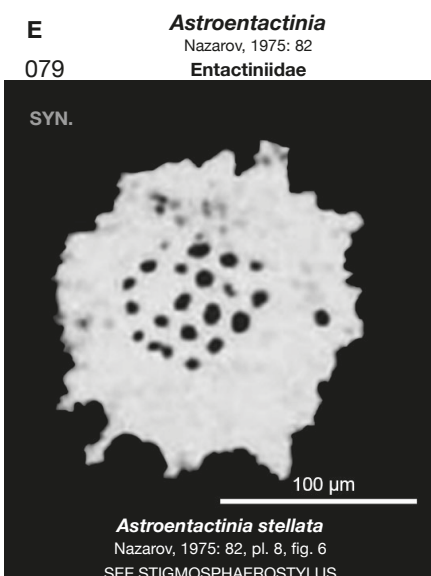
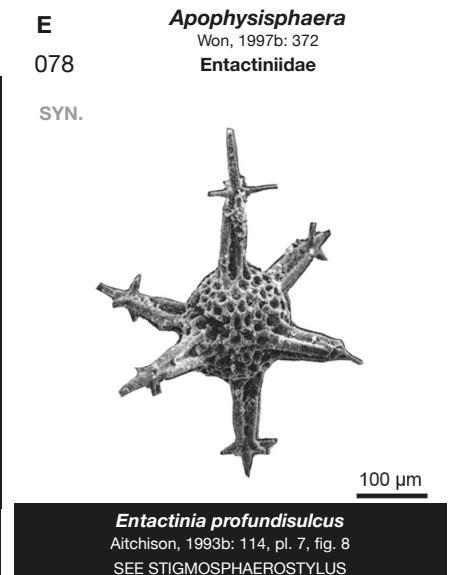
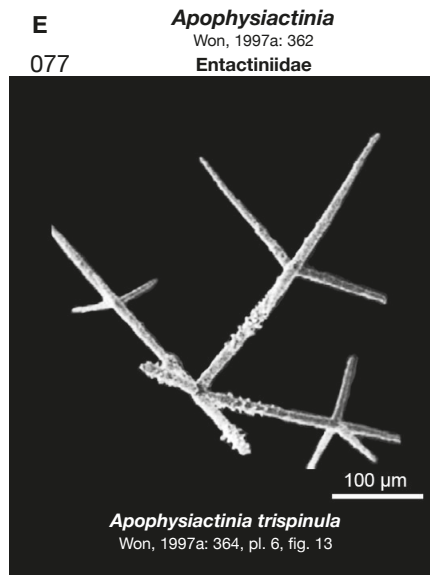
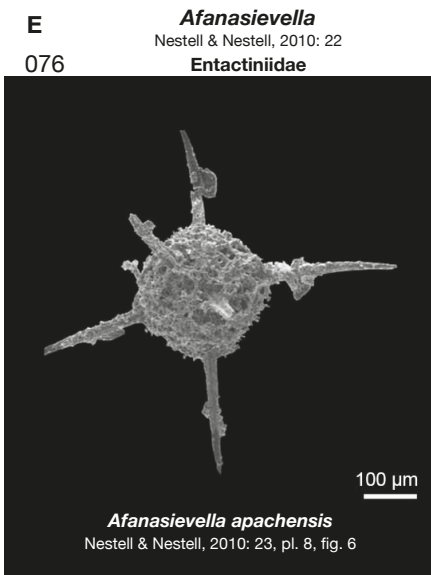
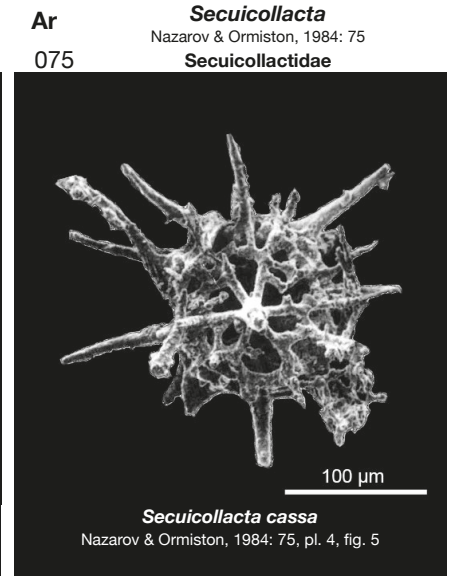
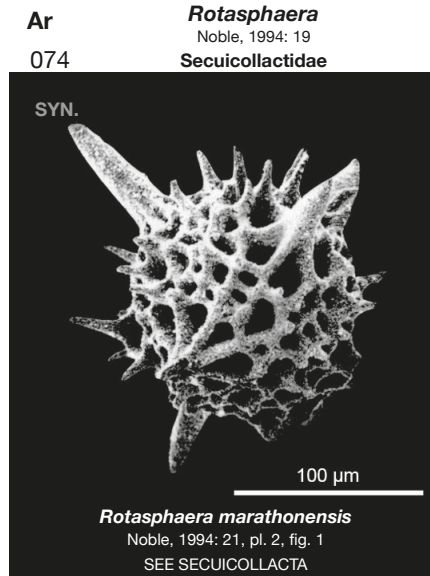
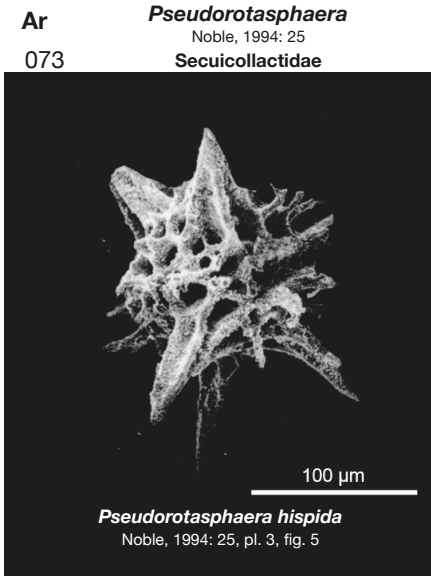


Ar
071
Parasecuicollacta
Won, Blodgett & Nestor, 2002: 953
Secuicollactidae



Ar
072
Parvalanapila
MacDonald, 1998: 597
Secuicollactidae





E
082

Bisphaera
Won, 1997a: 344
Entactiniidae

HOM., SYN.

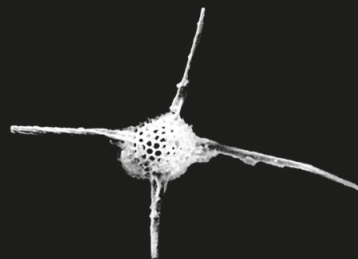


100 µm

Bisphaera solidispinosa
Won, 1997a: 346, pl. 3, fig. 9
SEE TRILONCHE

E
083

Borisella
Afanasieva, 2000b: 143
Entactiniidae

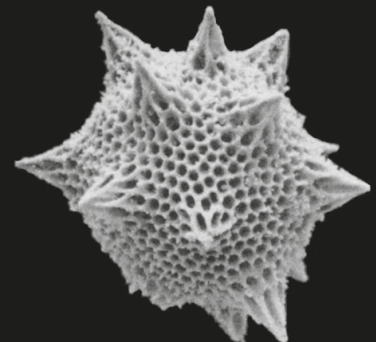


100 µm

Borisella maksimovae
Afanasieva, 2000b: 144, pl. 2, fig. 10

E
084

Callela
Won, 1983: 133
Entactiniidae

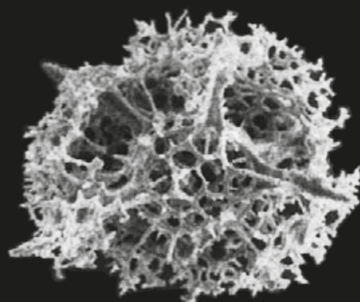


100 µm

Callela stellaesimilis
Won, 1983: 135, pl. 2, fig. 10

F
085

Cancellospaera
Afanasieva, 2000c: 34
Entactiniidae

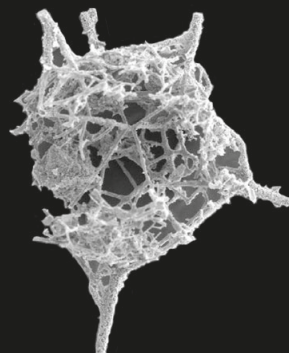


50 µm

Spongosphaera varia
Won, 1997b: 412, pl. 9, fig. 3

E
086

Costaentactinia
Seo & Won, 2009: 67
Entactiniidae



100 µm

Costaentactinia foremanae
Seo & Won, 2009: 67, pl. 2, fig. 13

E
087

Cyclocarpus
Li & Wang, 1991: 403
Entactiniidae

N.D.



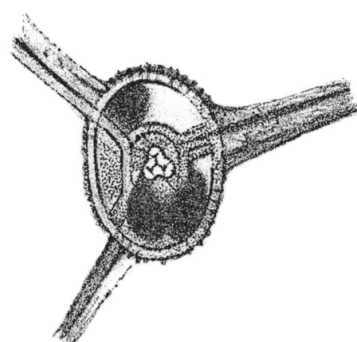
50 µm

Cyclocarpus tubiformis
Li & Wang, 1991: 403, pl. 1, fig. 2

E
088

Druppalonche
Hinde, 1899b: 217
Entactiniidae

SYN.



100 µm

Druppalonche clavigera
Hinde, 1899b: 217, pl. 16, fig. 14
SEE TRILONCHE

E
089

Duodecimentactinia
Won, 1997b: 377
Entactiniidae



100 µm

Duodecimentactinia aranea
Won, 1997b: 378, pl. 10, fig. 2

E
090

Duosphaera
Won, 1998: 235
Entactiniidae

SYN.



100 µm

Bisphaera solidispinosa
Won, 1997a: 346, pl. 3, fig. 9
SEE TRILONCHE

E
091
SYN.

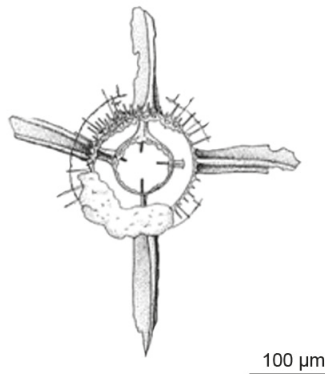
Entactinia
Foreman, 1963: 271
Entactiniidae



Entactinia herculea
Foreman, 1963: 271, pl. 1, fig. 3b
SEE STIGMOSPHAEROSTYLUS

E
092

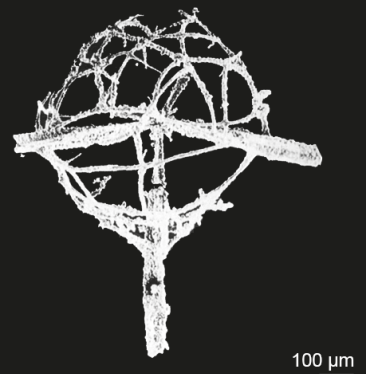
Entactinosphaera
Foreman, 1963: 274
Entactiniidae



Entactinosphaera esostrongyla
Foreman, 1963: 274, pl. 6, fig. 1a

E
093

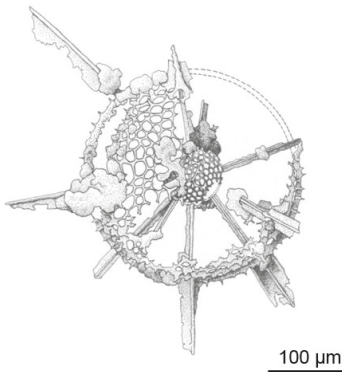
Gracilentactinia
Kozur & Mostler, 1989: 192
Entactiniidae



Gracilentactinia gracilis
Kozur & Mostler, 1989: 192, pl. 8, fig. 5

E
094
N.D.

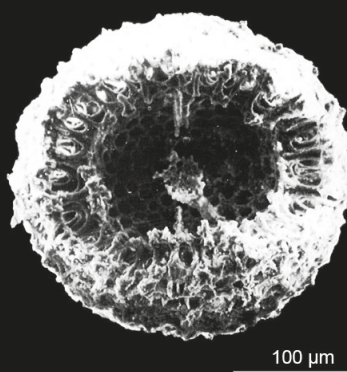
Helioentactinia
Nazarov, 1975: 88
Entactiniidae



Entactinosphaera ? polyacanthina
Foreman, 1963: 280, pl. 6, fig. 11

E
095

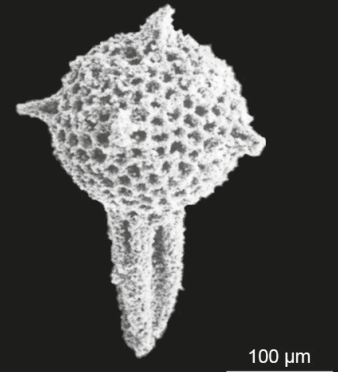
Holdisphaera
Kozur & Mostler, 1989: 186
Entactiniidae



Holdisphaera furutanii
Kozur & Mostler, 1989: 187, pl. 10, fig. 10

E
096
SYN.

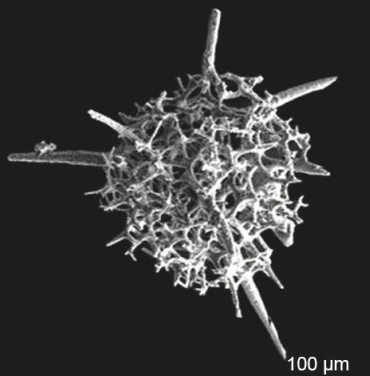
Inaequalientactinia
Won, 1991: 100
Entactiniidae



Inaequalientactinia typica
Won, 1991: 103, pl. 1, fig. 2
SEE STIGMOSPHAEROSTYLUS

E
097

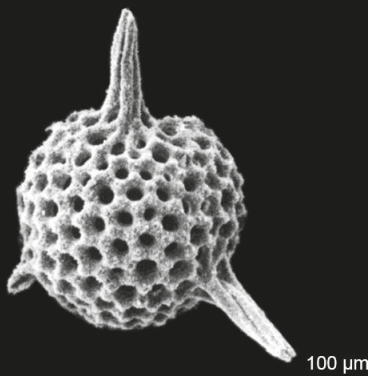
Involuentactinia
Jones & Noble, 2006: 296
Entactiniidae



Involuentactinia eccentrica
Jones & Noble, 2006: 297, pl. 1, fig. 8

E
098

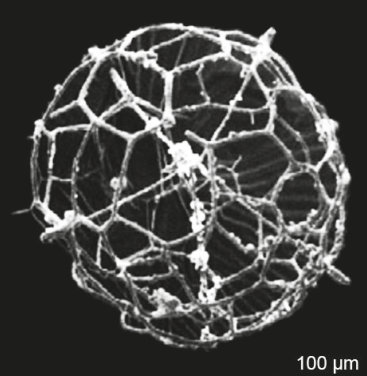
Kashiwara
Sashida & Tonishi, 1985: 14
Entactiniidae



Kashiwara magna
Sashida & Tonishi, 1985: 15, pl. 5, fig. 6

E
099

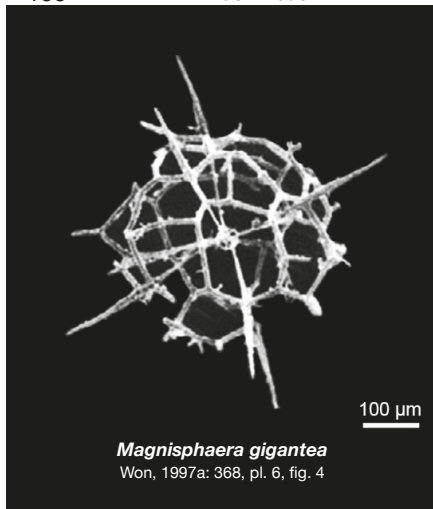
Magentactinia
Won, 1997a: 366
Entactiniidae



Magentactinia fragilis
Won, 1997a: 366, pl. 6, fig. 1

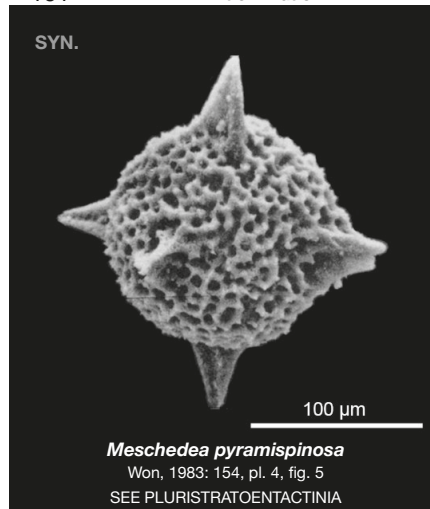
E
100

Magnisphaera
Won, 1997a: 366
Entactiniidae



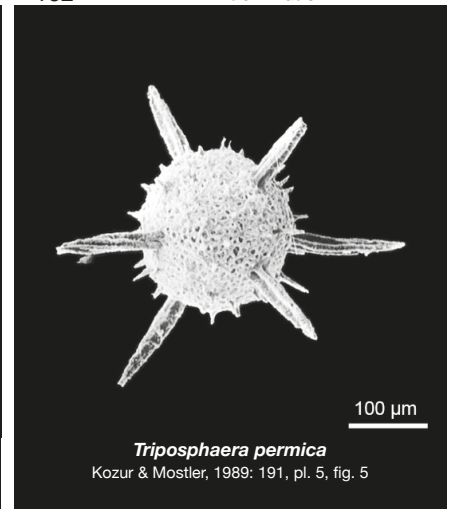
E
101

Meschedea
Won, 1983: 154
Entactiniidae



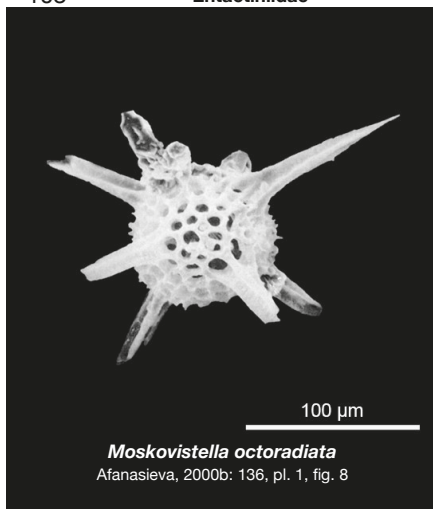
E
102

Microporosa
Afanasieva & Amon, 2016: 211
Entactiniidae



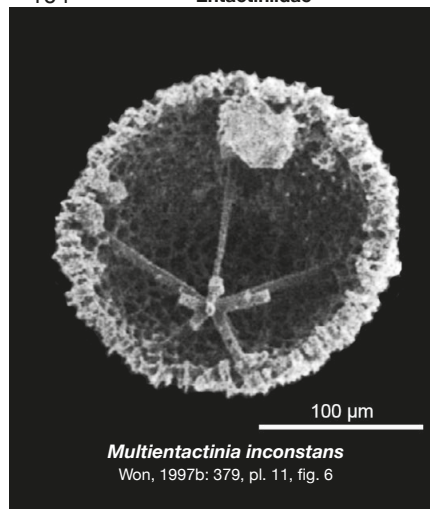
E
103

Moskovistella
Afanasieva, 2000b: 135
Entactiniidae



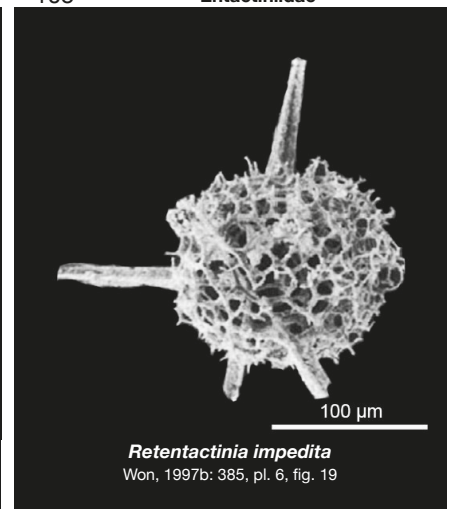
E
104

Multientactinia
Won, 1997b: 378
Entactiniidae



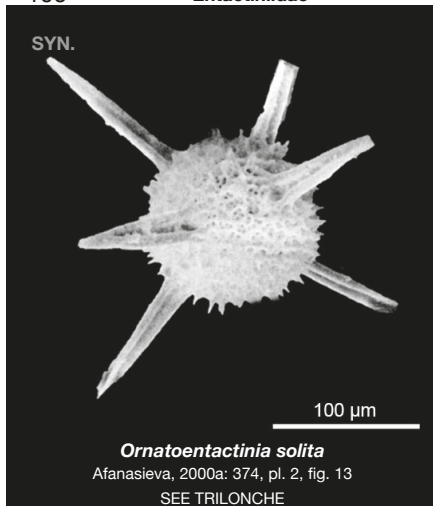
E
105

Munzuwonella
Afanasieva, 2009: 115
Entactiniidae



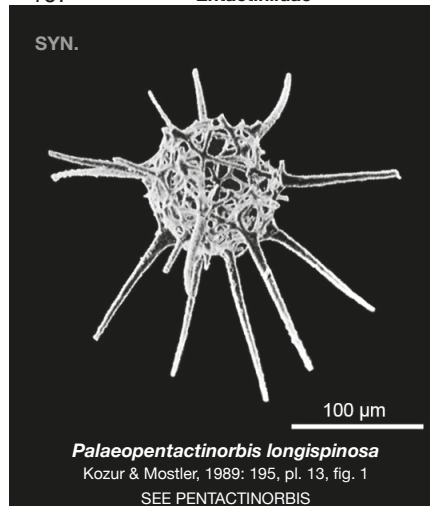
E
106

Ornatoentactinia
Afanasieva, 2000a: 373
Entactiniidae



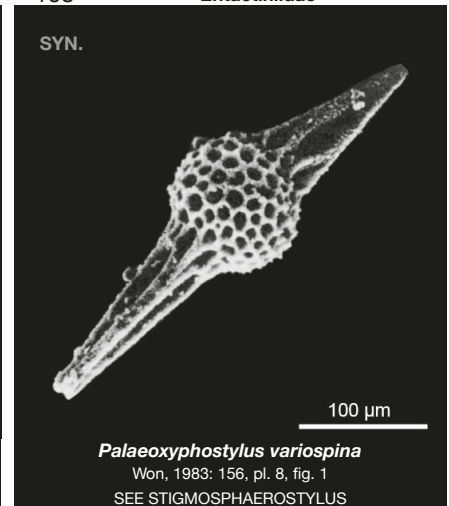
E
107

Palaeopentactinorbis
Kozur & Mostler, 1989: 195
Entactiniidae

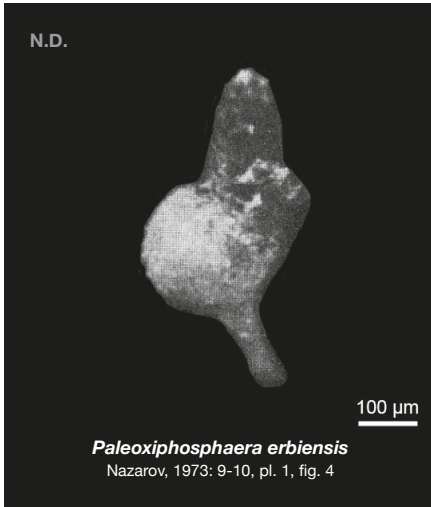


E
108

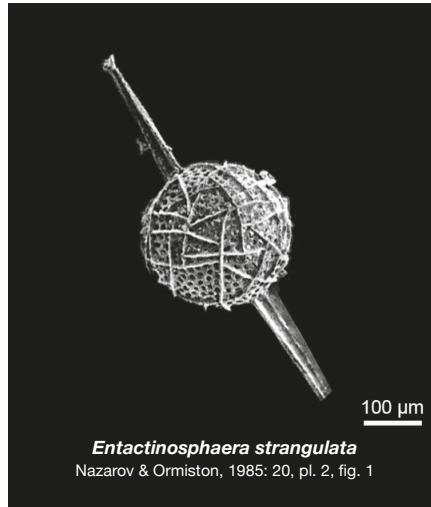
Palaeoxyphostylus
Won, 1983: 155
Entactiniidae



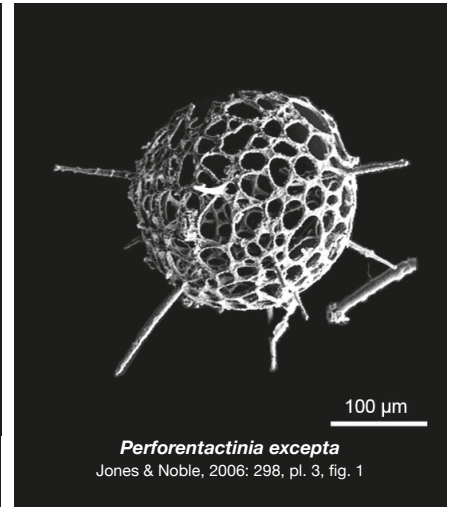
E
109 *Paleoxiphosphaera*
Nazarov, 1973: 9
Entactiniidae



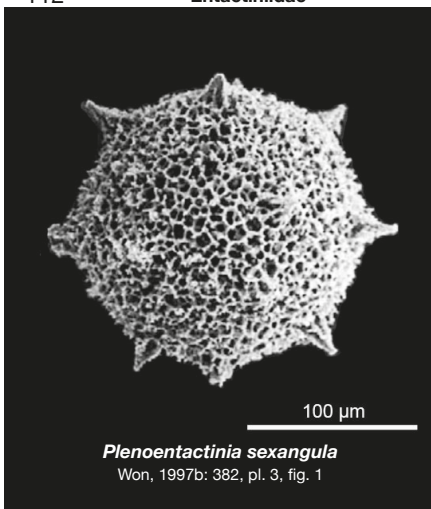
E
110 *Paratriposphaera*
Kozur & Mostler, 1989: 187
Entactiniidae



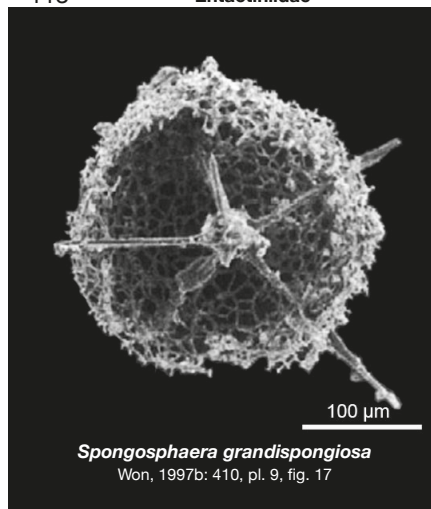
E
111 *Perforentactinia*
Jones & Noble, 2006: 298
Entactiniidae



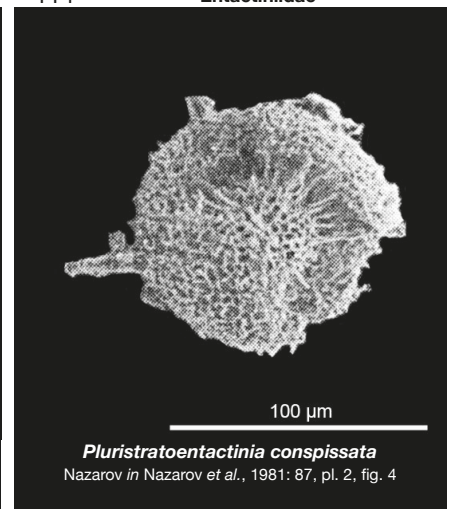
E
112 *Plenoentactinia*
Won, 1997b: 381
Entactiniidae



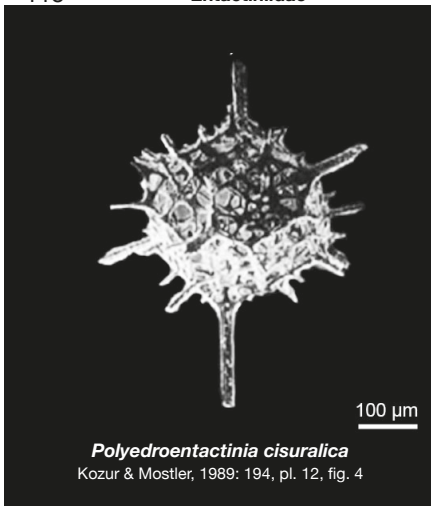
E
113 *Plenosphaera*
Park & Won, 2012: 56
Entactiniidae



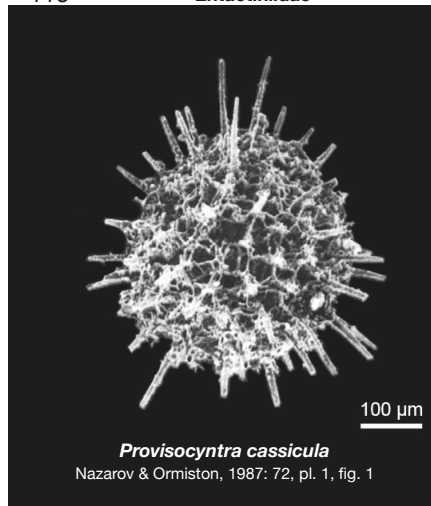
E
114 *Pluristratoentactinia*
Nazarov in Nazarov et al., 1981: 86
Entactiniidae



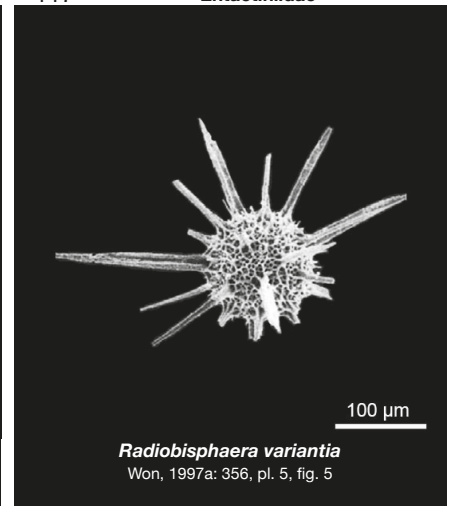
E
115 *Polyedroentactinia*
Kozur & Mostler, 1989: 194
Entactiniidae



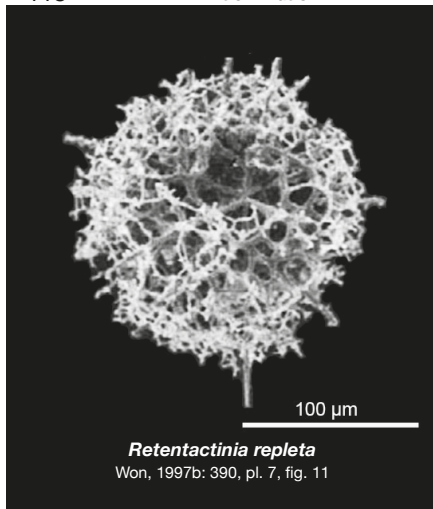
E
116 *Provisocyntra*
Nazarov & Ormiston, 1987: 68
Entactiniidae



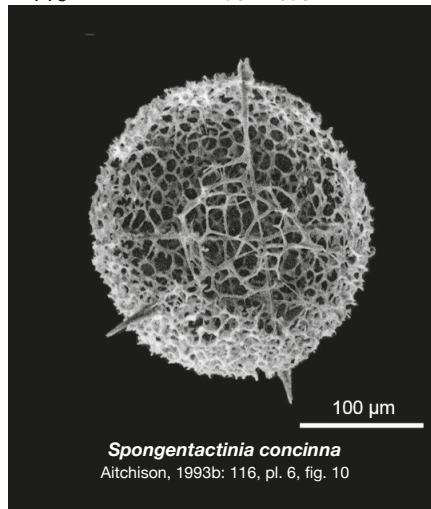
E
117 *Radiobisphaera*
Won, 1997a: 350
Entactiniidae



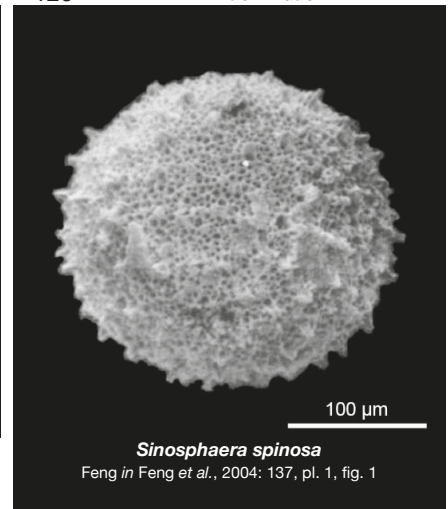
E
118 *Retentactinia*
Entactiniidae



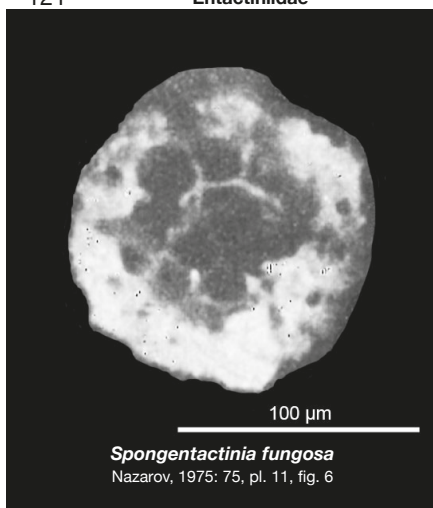
E
119 *Retisphaera*
Entactiniidae



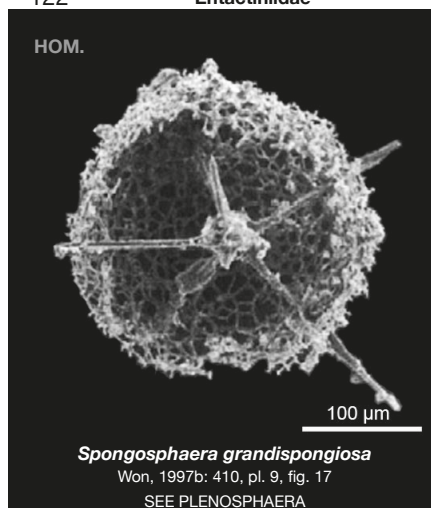
E
120 *Sinosphaera*
Entactiniidae



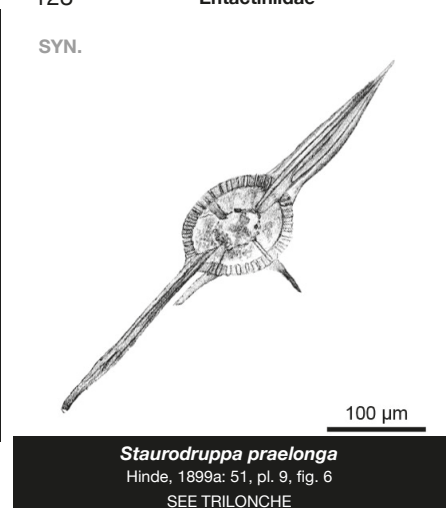
E
121 *Spongactinia*
Entactiniidae



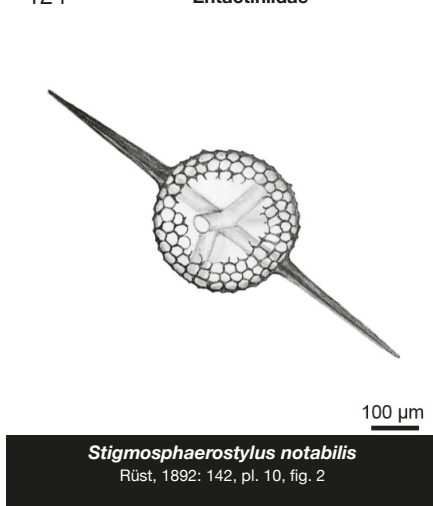
E
122 *Spongosphaera*
Entactiniidae



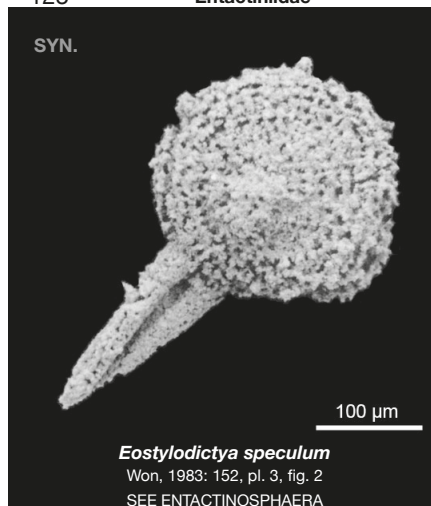
E
123 *Staurodruppa*
Entactiniidae



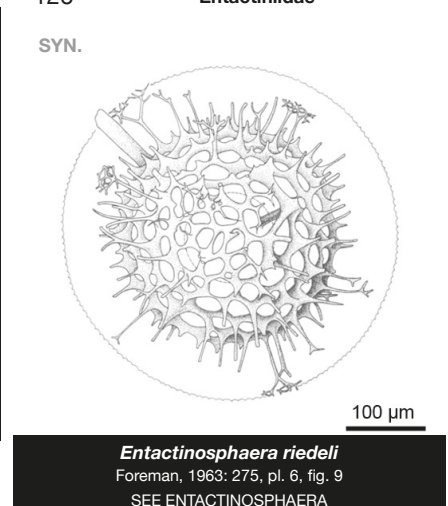
E
124 *Stigmosphaerostylus*
Entactiniidae



E
125 *Stolbergia*
Entactiniidae

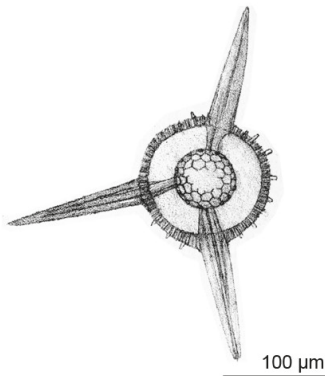


E
126 *Thecentactinia*
Entactiniidae



E
127

Trilonche
Hinde, 1899a: 47
Entactiniidae



100 µm

Trilonche vetusta
Hinde, 1899a: 48, pl. 8, fig. 18

E
128

Uberinterna
Sashida & Tonishi, 1988: 531
Entactiniidae



100 µm

Uberinterna virgispinosum
Sashida & Tonishi, 1988: 531, fig. 8.7

E
129

Wonella
Afanasieva, 2000c: 34
Entactiniidae

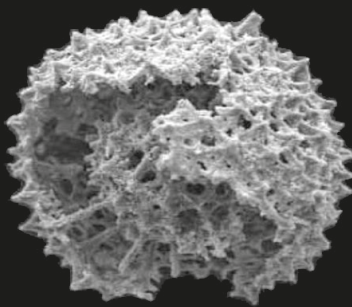


100 µm

Retentactinia impedita
Won, 1997b: 385, pl. 6, fig. 19

E
130

Wuyia
Feng in Feng et al., 2007: 31
Entactiniidae



100 µm

Wuyia dongpanica
Feng in Feng et al., 2007: 33, pl. 5, fig. 9

E
131

Arcoclathrata
Afanasieva & Amon, 2016: 217
Haplentactiniidae



100 µm

Arcoclathrata alekseevi
Afanasieva & Amon, 2016: 219, pl. 2, fig. 9

E
132

Arrhiniella
Kozur & Mostler, 1981: 4
Haplentactiniidae

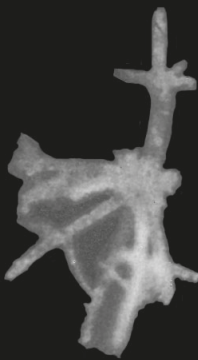


100 µm

Haplentactinia arrhinia
Foreman, 1963: 270, pl. 1, fig. 1
SEE HAPLENTACTINIA

E
133

Bissylentactinia
Nazarov, 1975: 93
Haplentactiniidae

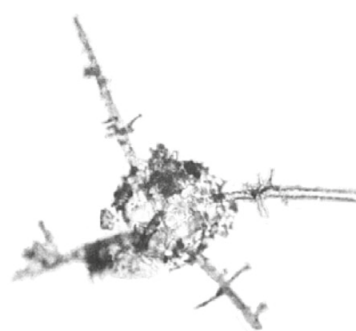


100 µm

Bissylentactinia rudicula
Nazarov, 1975: 94, pl. 13, fig. 1

E
134

Haplentactinia
Foreman, 1963: 270
Haplentactiniidae

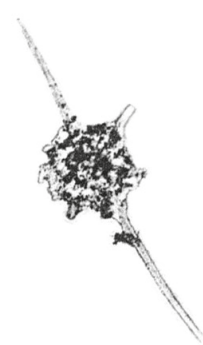


100 µm

Haplentactinia rhinophyusa
Foreman, 1963: 270, pl. 1, fig. 2

E
135

Syntagentactinia
Nazarov in Nazarov & Popov, 1980: 56
Haplentactiniidae



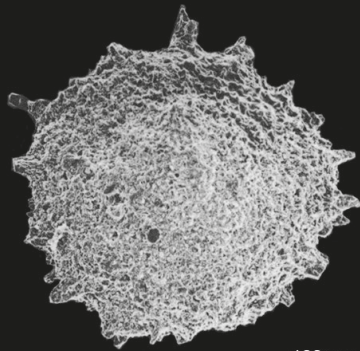
100 µm

Syntagentactinia biocculosa
Nazarov in Nazarov & Popov, 1980: 56, pl. 12, fig. 1

E
136

Eostylodictya
Ormiston & Lane, 1976: 170
Palaeolithocyliidae

SYN.

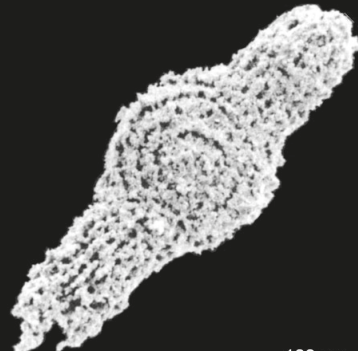


Eostylodictya eccentrica
Ormiston & Lane, 1976: 171, pl. 4, fig. 1
SEE PALAEOLITHOCYCLIA

E
137

Gedauia
Won, 1983: 153
Palaeolithocyliidae

SYN.

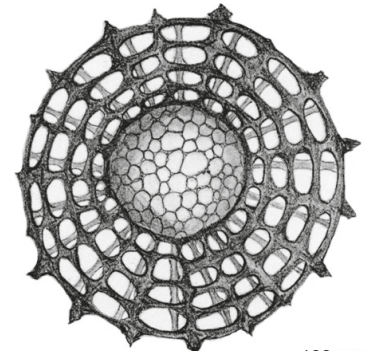


Gedauia bibrachialis
Won, 1983: 153, pl. 3, fig. 5
SEE PARAMPHIBRACHIUM

E
138

Palaeoaastrocyelia
Kozur & Mostler, 1972: 16
Palaeolithocyliidae

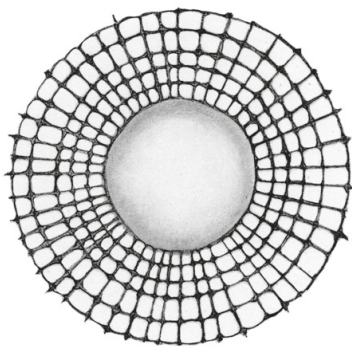
SYN.



Lithocyelia ulrichi
Rüst, 1892: 166, pl. 22, fig. 3
SEE PALAEOLITHOCYCLIA

E
139

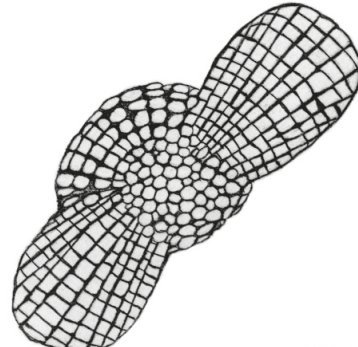
Palaeolithocyelia
Kozur & Mostler, 1972: 17
Palaeolithocyliidae



Lithocyelia macrococcus
Rüst, 1892: 166, pl. 22, fig. 4

E
140

Paramphibrachium
Kozur & Mostler, 1978: 143
Palaeolithocyliidae



Amphymenium alienum
Rüst, 1892: 170, pl. 24, fig. 2

E
141

Sphaerodiscus
Won, 1983: 163
Palaeolithocyliidae

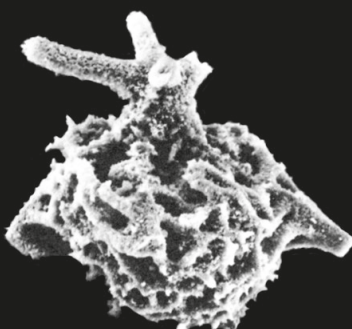
SYN.



Sphaerodiscus rota
Won, 1983: 163, pl. 3, fig. 10a
SEE PALAEOLITHOCYCLIA

E
142

Deflantrica
Wakamatsu, Sugiyama & Furutani, 1990: 167
Palaeosceniidae

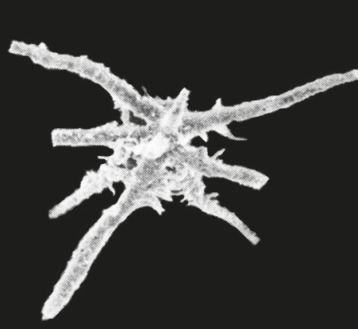


Parentactinia vetustum
Furutani, 1983: 108, pl. 21, fig. 5a

E
143

Fukujius
Furutani, 1990: 46
Palaeosceniidae

N.D.



Fukujius yamakoshii
Furutani, 1990: 47, pl. 9, fig. 4

E
144

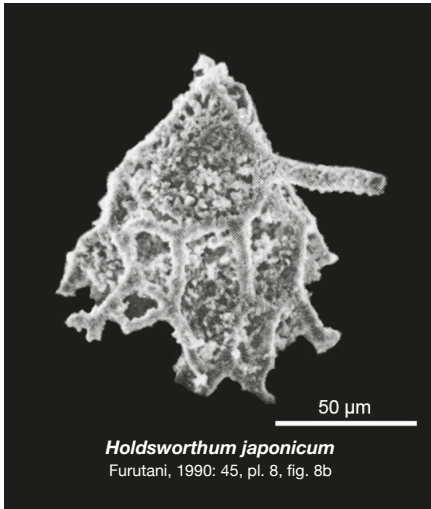
Goodbodyum
Furutani, 1990: 43
Palaeosceniidae

SYN.

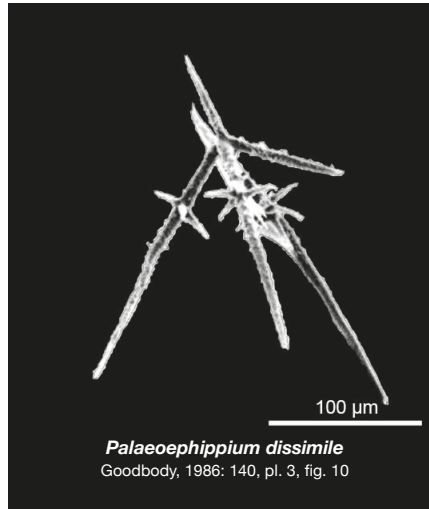


Palaeoscenidium flammatum
Goodbody, 1986: 152, pl. 1, fig. 4
SEE PALAEOSCENIDIUM

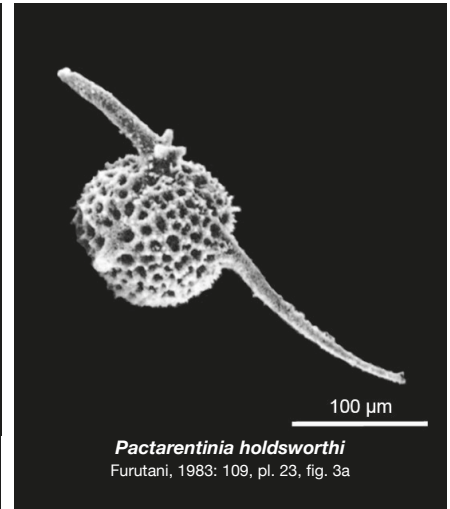
E
145 *Holdsworthum*
Furutani, 1990: 44
Palaeosценидиidae



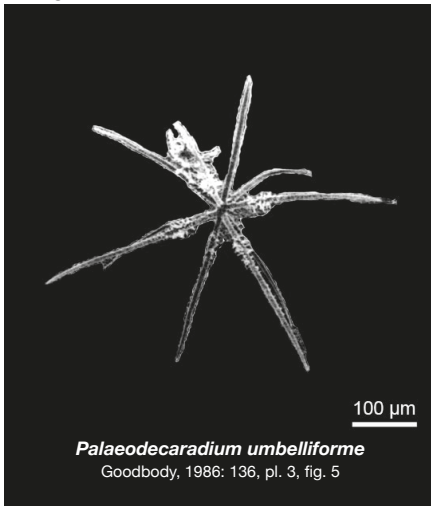
E
146 *Insolitignum*
MacDonald, 1999: 2053
Palaeosценидиidae



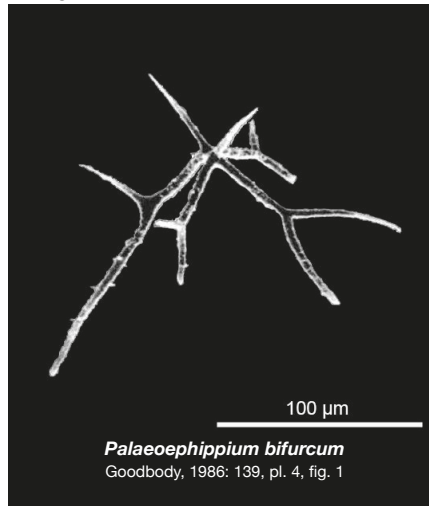
E
147 *Pactarentinia*
Furutani, 1983: 109
Palaeosценидиidae



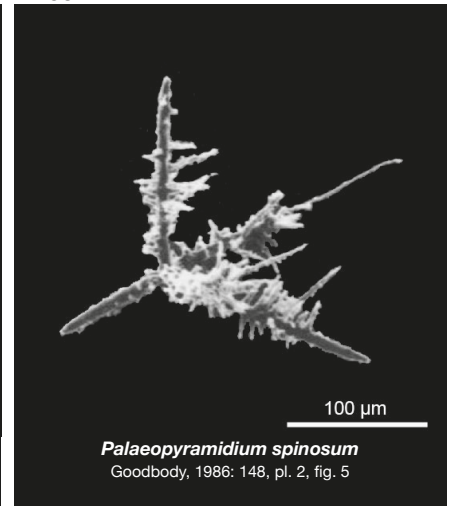
E
148 *Palaeodecaradium*
Goodbody, 1986: 136
Palaeosценидиidae



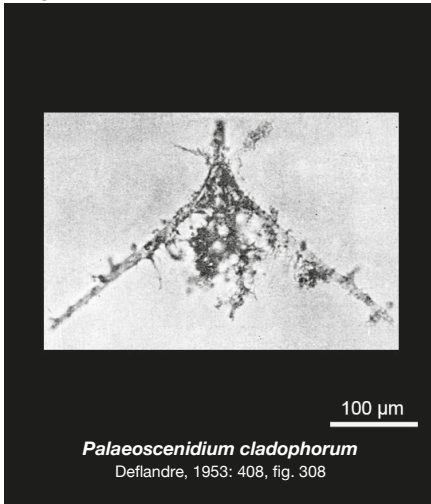
E
149 *Palaeoehippium*
Goodbody, 1986: 138
Palaeosценидиidae



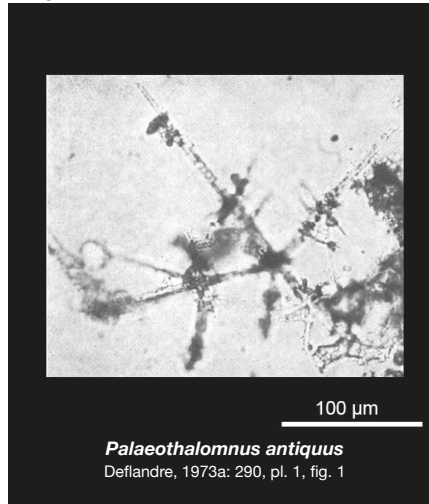
E
150 *Palaeopyramidium*
Goodbody, 1986: 147
Palaeosценидиidae



E
151 *Palaeosцениidium*
Deflandre, 1953: 408
Palaeosценидиidae

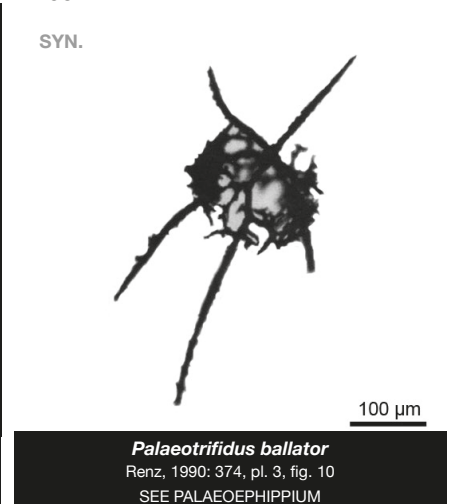


E
152 *Palaeothalomnus*
Deflandre, 1973b: 497
Palaeosценидиidae



E
153 *Palaeotrifidus*
Renz, 1990: 374
Palaeosценидиidae

SYN.



E
154

Palaeotripus
Goodbody, 1986: 152
Palaeoscenediidae

SYN.



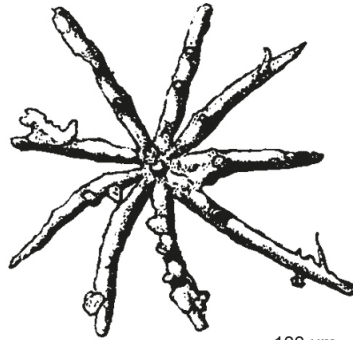
100 µm

Palaeotripus nudus
Goodbody, 1986: 154, pl. 1, fig. 8
SEE PALAEODECARADIUM

E
155

Palaeoumbraculum
Amon, Braun & Ivanov, 1995: 8
Palaeoscenediidae

SYN.

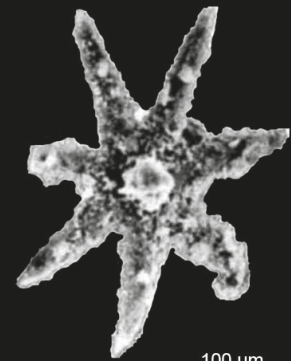


100 µm

Palaeoumbraculum expandum
Amon, Braun & Ivanov, 1995: 8, text-fig. 12a
SEE PRAESATURNALIS

E
156

Praesaturnalis
Li, 1994: 269
Palaeoscenediidae



100 µm

Praesaturnalis septemistellatus
Li, 1994: 269, pl. 1, fig. 15

E
157

Procyrtis
Li, 1995: 336
Palaeoscenediidae



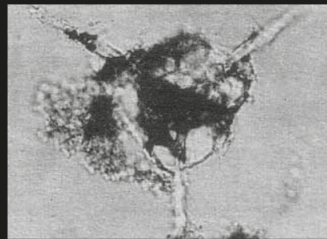
50 µm

Procyrtis rustii
Li, 1995: 336, pl. 1, fig. 17

E
158

Tetraedroclathrum
Deflandre, 1960: 216
Palaeoscenediidae

N.N.



100 µm

Tetraedroclathrum cabrierense
Deflandre, 1960: 216, pl. 1, fig. 22

E
159

Tlecerina
Furutani, 1983: 110
Palaeoscenediidae

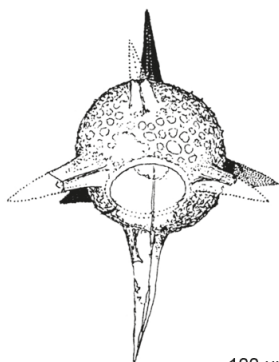


100 µm

Tlecerina horrida
Furutani, 1983: 110, pl. 25, fig. 1

E
160

Pylentonema
Deflandre, 1963: 3981
Pylentonemidae

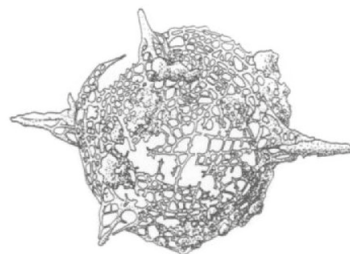


100 µm

Acanthopyle antiqua
Deflandre, 1963: 3982, fig. 1

E
161

Polyentactinia
Foreman, 1963: 281
Pylentonemidae

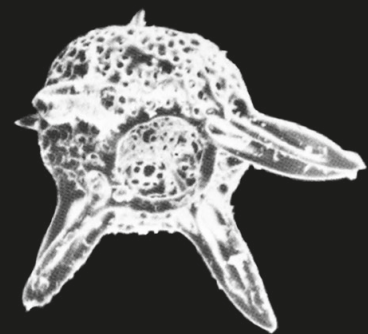


100 µm

Polyentactinia craticulata
Foreman, 1963: 281, pl. 9, fig. 5b

E
162

Quadrapesus
Cheng, 1986: 121
Pylentonemidae

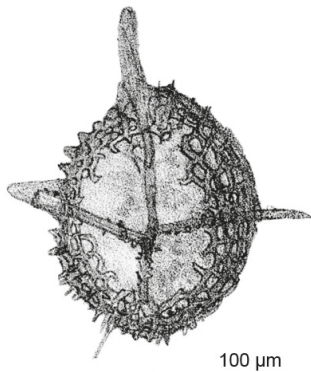


100 µm

Quadrapesus dimitricai
Cheng, 1986: 121, pl. 2, fig. 11

E
163
Ellipsostigma
Hinde, 1899a: 51
Tetrentactiniidae

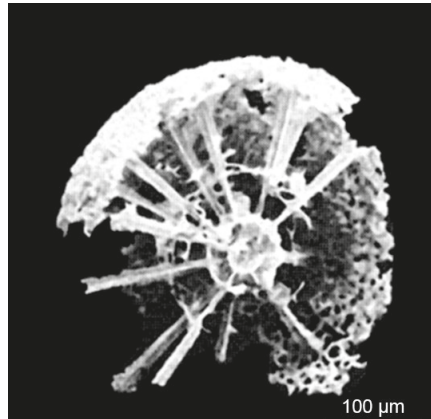
N.D.



100 µm

Ellipsostigma australe
Hinde, 1899a: 51, pl. 9, fig. 5

E
164
Multisphaera
Nazarov & Afanasieva in Afanasieva, 2000c: 75
Tetrentactiniidae

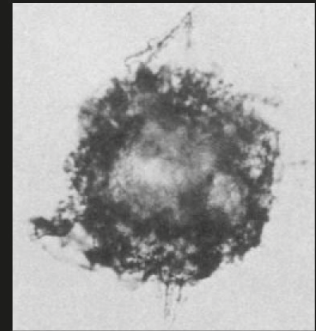


100 µm

Multisphaera impersepta
Nazarov & Afanasieva in Afanasieva, 2000c: 75, pl. 81, fig. 7

E
165
Somphoentactinia
Nazarov, 1975: 92
Tetrentactiniidae

SYN.

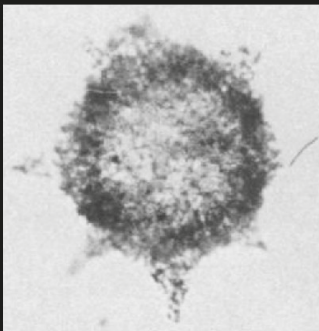


100 µm

Tetrentactinia somphozona
Foreman, 1963: 283, pl. 7, fig. 6a
SEE TETRENTACTINIA

E
166
Spongentactinella
Nazarov, 1975: 91
Tetrentactiniidae

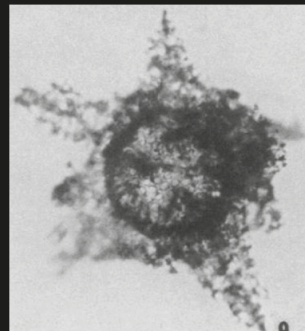
SYN.



100 µm

Tetrentactinia veles
Foreman, 1963: 283, pl. 7, fig. 1
SEE TETRENTACTINIA

E
167
Tetrentactinia
Foreman, 1963: 282
Tetrentactiniidae



100 µm

Tetrentactinia barysphaera
Foreman, 1963: 282, pl. 7, fig. 9

E
168
Trienosphaera
Deflandre, 1973c: 1150
Tetrentactiniidae



100 µm

Trienosphaera sicarius
Deflandre, 1973c: 1150, pl. 2, fig. 3

E
169
Triaoentactinosphaera
Wang, 1997: 155
Tetrentactiniidae

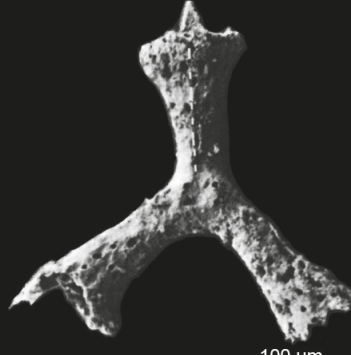
SYN.



100 µm

Triaoentactinosphaera regularia
Wang, 1997: 156, pl. 4, fig. 8
SEE TRIANOSPHAERA

L
170
Caulella
Caridroit, De Wever & Dumitrica, 1999: 608
Caulellidae

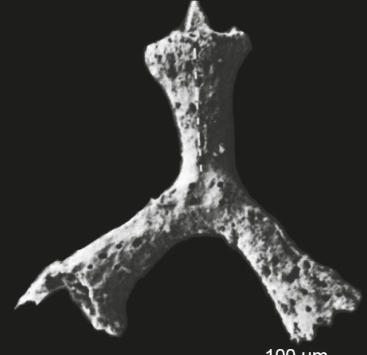


100 µm

Deflandrella manica
De Wever & Caridroit, 1984: 99, pl. 1, fig. 2

L
171
Deflandrella
De Wever & Caridroit, 1984: 99
Caulellidae

HOM.

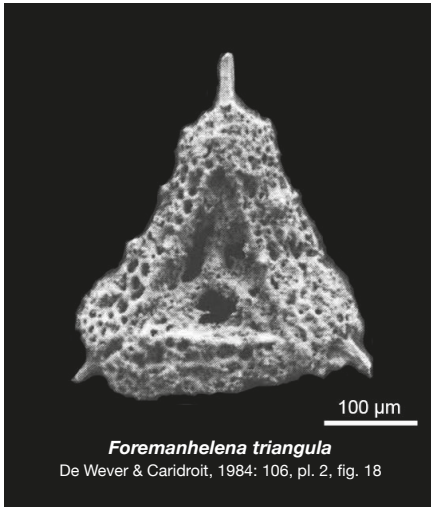


100 µm

Deflandrella manica
De Wever & Caridroit, 1984: 99, pl. 1, fig. 2
SEE CAULELLA

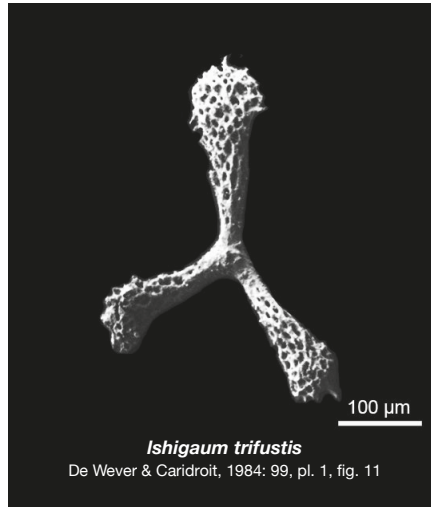
L
172

Foremanhelenia
De Wever & Caridroit, 1984: 104
Cauletellidae



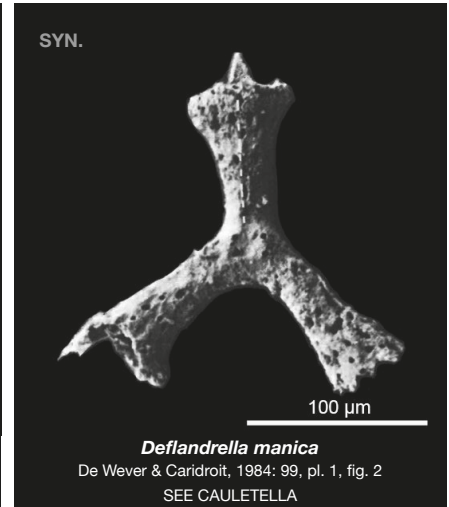
L
173

Ishigaum
De Wever & Caridroit, 1984: 99
Cauletellidae



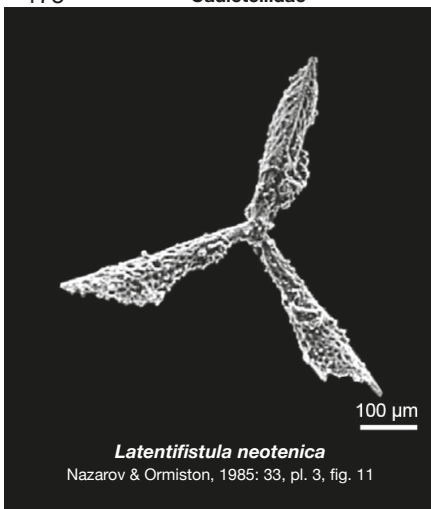
L
174

Kimagior
Sugiyama, 2000: 228
Cauletellidae



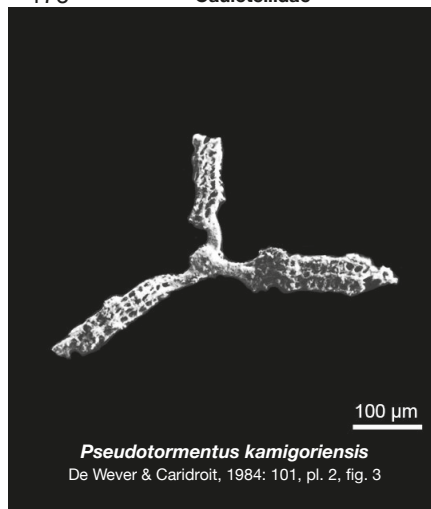
L
175

Praedeflandrella
Kozur & Mostler, 1989: 211
Cauletellidae



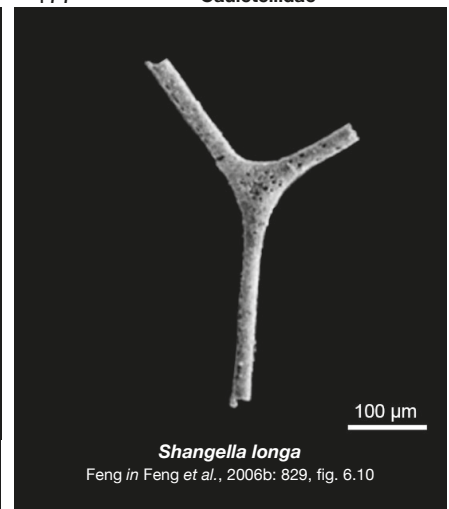
L
176

Pseudotormentus
De Wever & Caridroit, 1984: 101
Cauletellidae



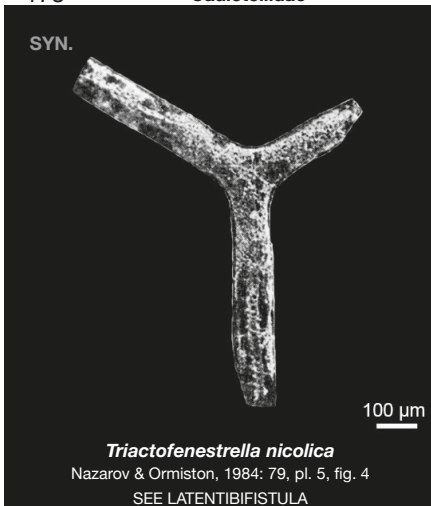
L
177

Shangella
Feng in Feng *et al.*, 2006b: 828
Cauletellidae



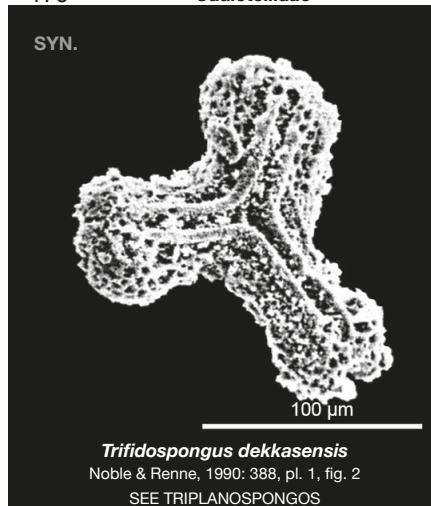
L
178

Triactofenestrella
Nazarov & Ormiston, 1984: 79
Cauletellidae



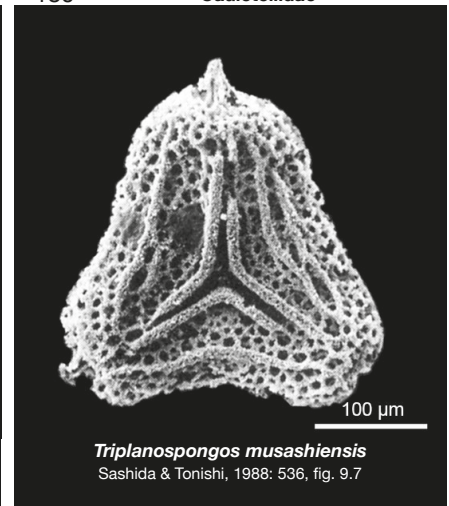
L
179

Trifidospongos
Noble & Renne, 1990: 388
Cauletellidae



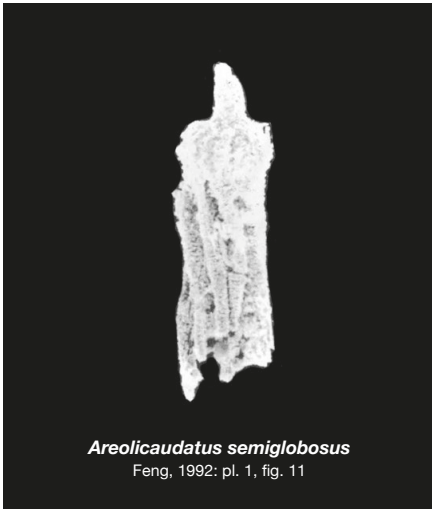
L
180

Triplanospongos
Sashida & Tonishi, 1988: 536
Cauletellidae



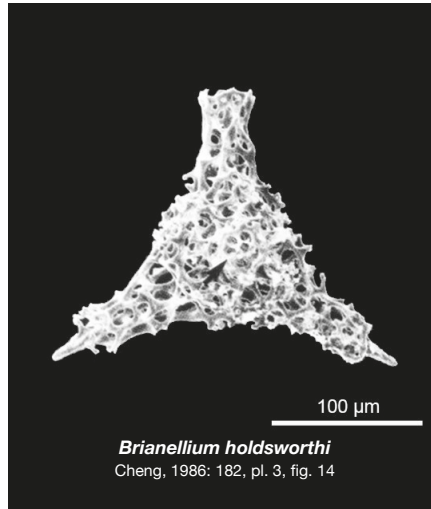
L
181

Areolicaudatus
Feng & Liu, 1993: 545
Latentifistulidae



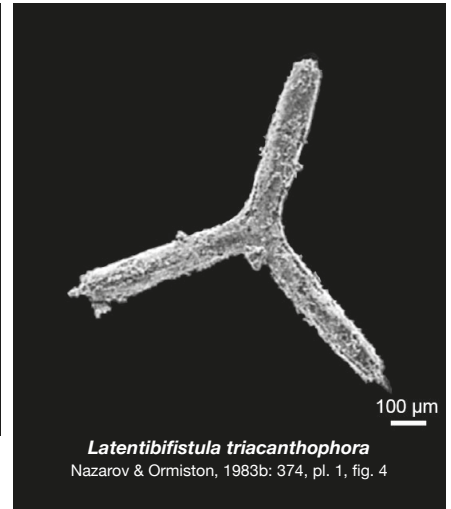
L
182

Brianellium
Cheng, 1986: 180
Latentifistulidae



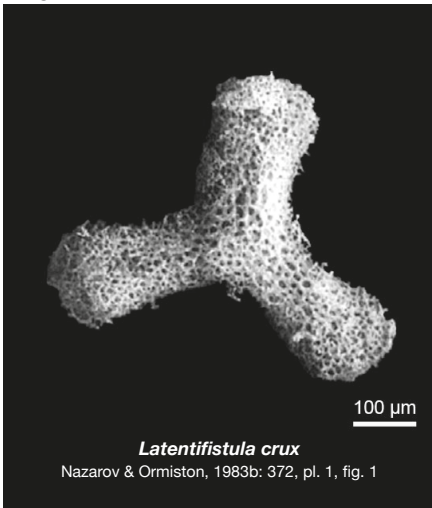
L
183

Latentibifistula
Nazarov & Ormiston, 1983b: 373
Latentifistulidae



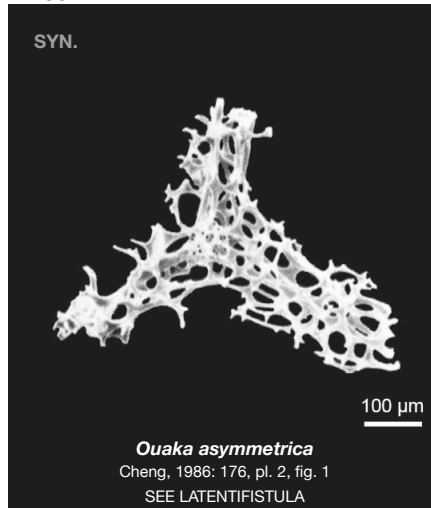
L
184

Latentifistula
Nazarov & Ormiston, 1983b: 371
Latentifistulidae



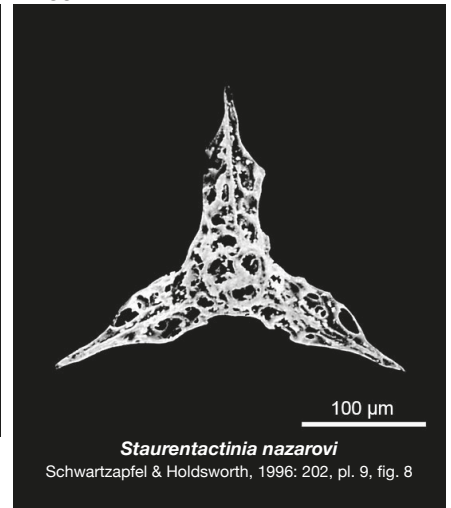
L
185

Ouaka
Cheng, 1986: 176
Latentifistulidae



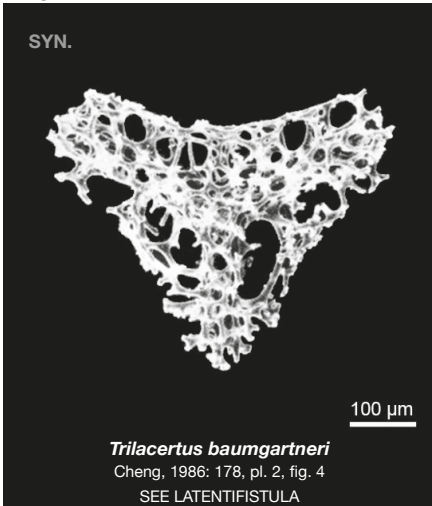
L
186

Staurentactinia
Schwartzapfel & Holdsworth, 1996: 202
Latentifistulidae



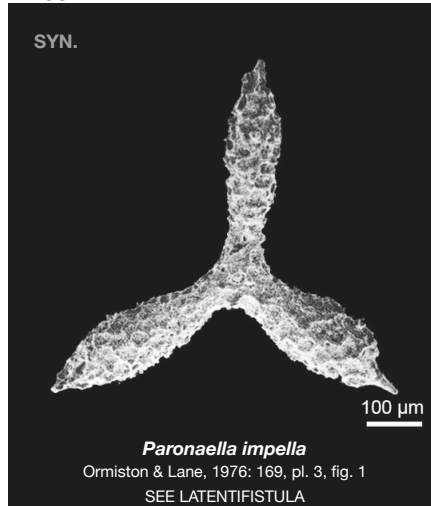
L
187

Trilacertus
Cheng, 1986: 177
Latentifistulidae



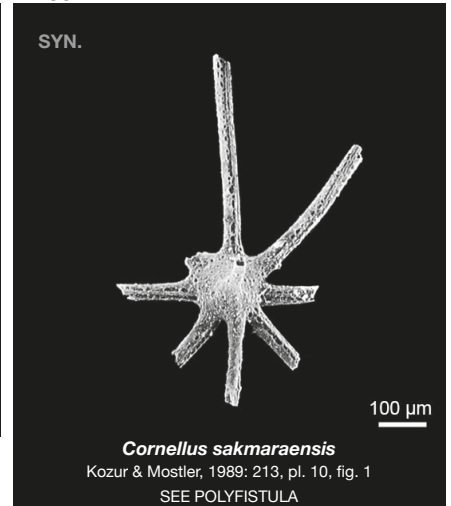
L
188

Wonella
Kozur & Mostler, 1989: 220
Latentifistulidae



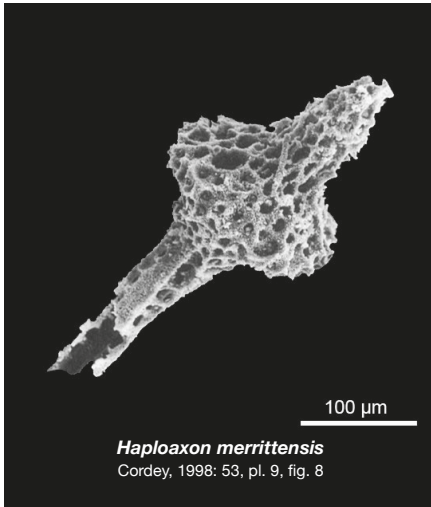
L
189

Cornellus
Kozur & Mostler, 1989: 212
Ormistonellidae



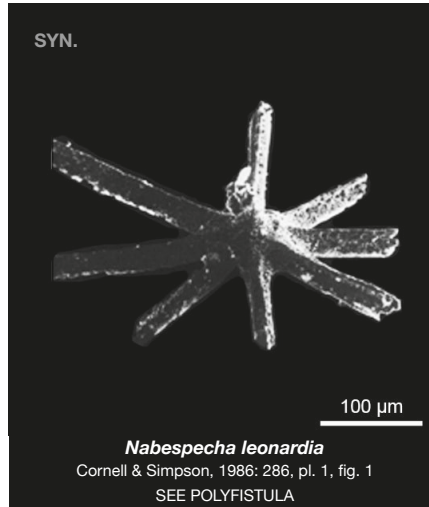
L
190

Haploaxon
Cordey, 1998: 52
Ormistonellidae



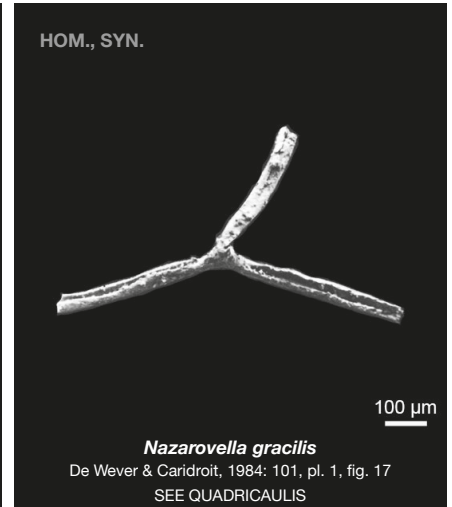
L
191

Nabespecha
Cornell & Simpson, 1986: 286
Ormistonellidae



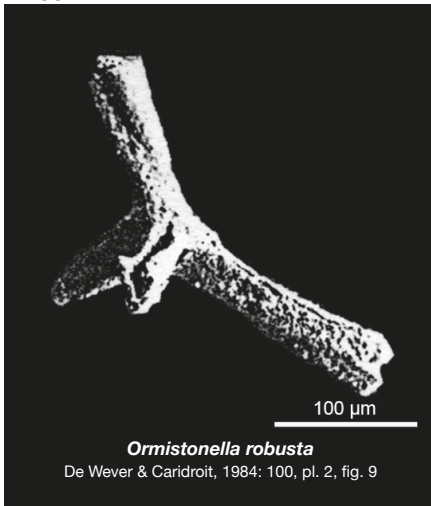
L
192

Nazarovella
De Wever & Caridroit, 1984: 101
Ormistonellidae



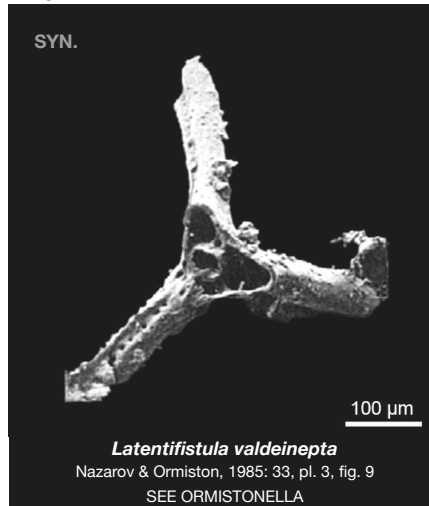
L
193

Ormistonella
De Wever & Caridroit, 1984: 100
Ormistonellidae



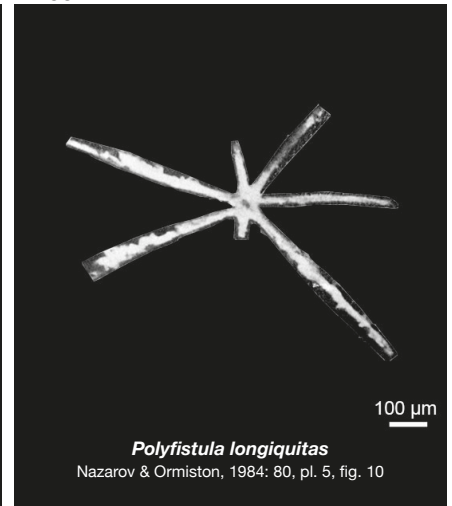
L
194

Paulianella
Kozur & Mostler, 1989: 215
Ormistonellidae



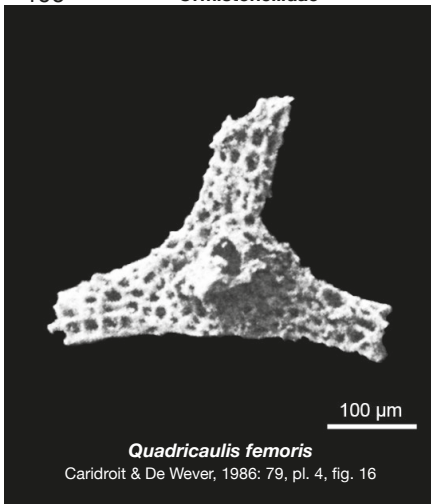
L
195

Polyfistula
Nazarov & Ormiston, 1984: 80
Ormistonellidae



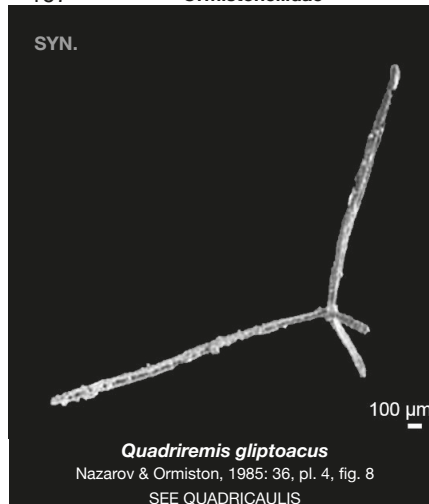
L
196

Quadracaulis
Caridroit & De Wever, 1986: 79
Ormistonellidae



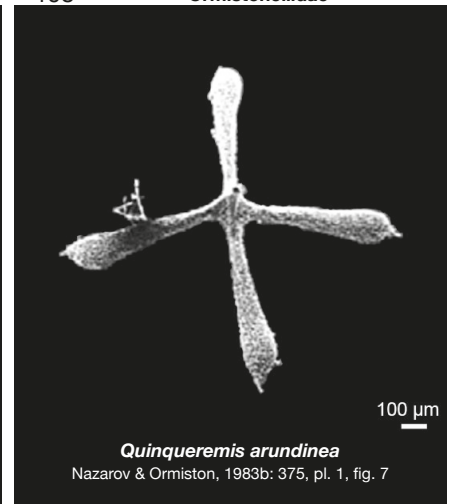
L
197

Quadriremis
Nazarov & Ormiston, 1985: 36
Ormistonellidae



L
198

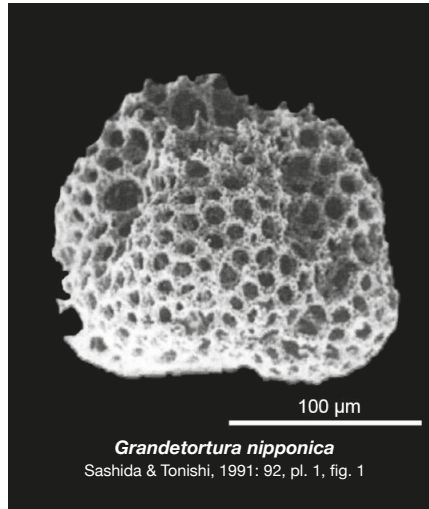
Quinqueremis
Nazarov & Ormiston, 1983b: 374
Ormistonellidae



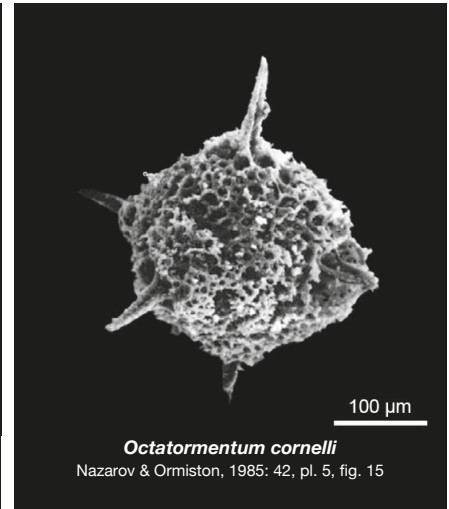
L
199
Raciditor
Sugiyama, 2000: 227
Ormistonellidae



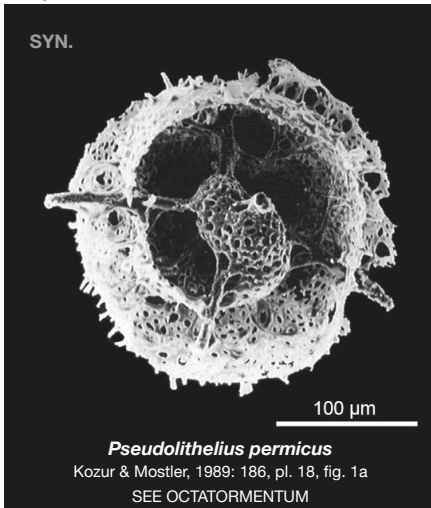
L
200
Grandetortura
Sashida & Tonishi, 1991: 90
Pseudolitheliidae



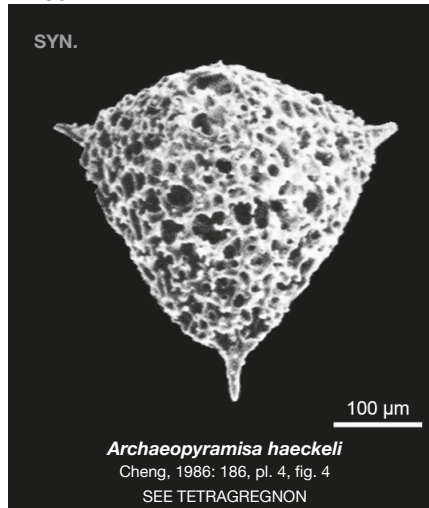
L
201
Octatortum
Nazarov & Ormiston, 1985: 42
Pseudolitheliidae



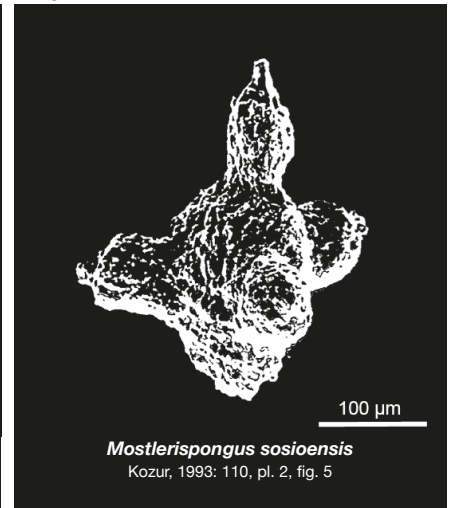
L
202
Pseudolithelius
Kozur & Mostler, 1989: 185
Pseudolitheliidae



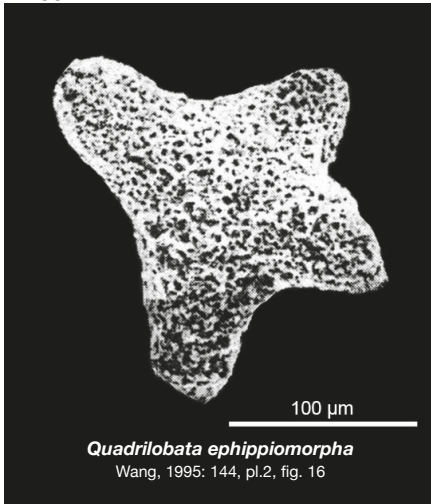
L
203
Archaeopyramisa
Cheng, 1986: 185
Tetratortentidae



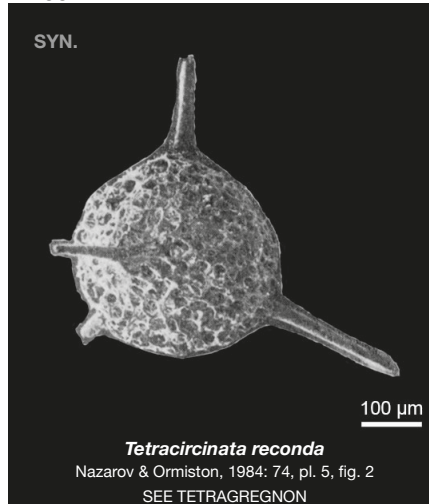
L
204
Mostlerispongus
Kozur, 1993: 110
Tetratortentidae



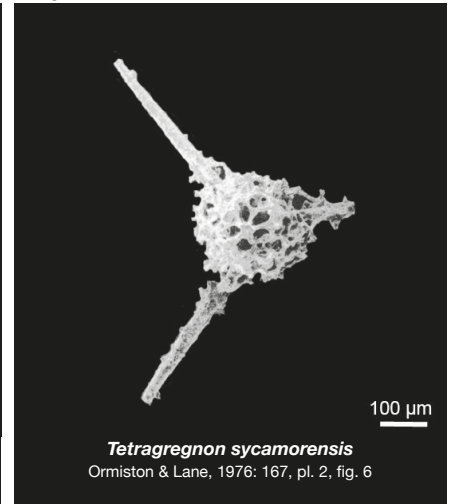
L
205
Quadrilobata
Wang, 1995: 144
Tetratortentidae

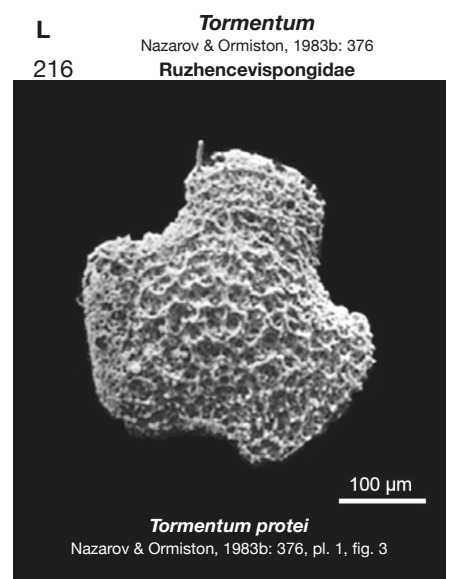
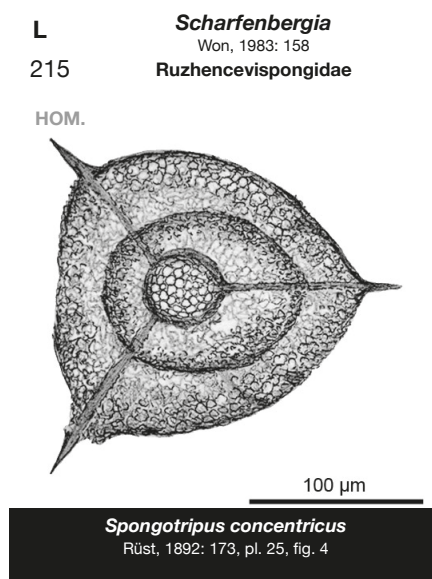
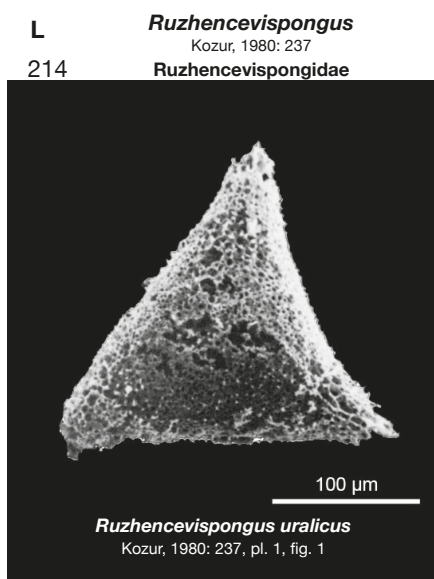
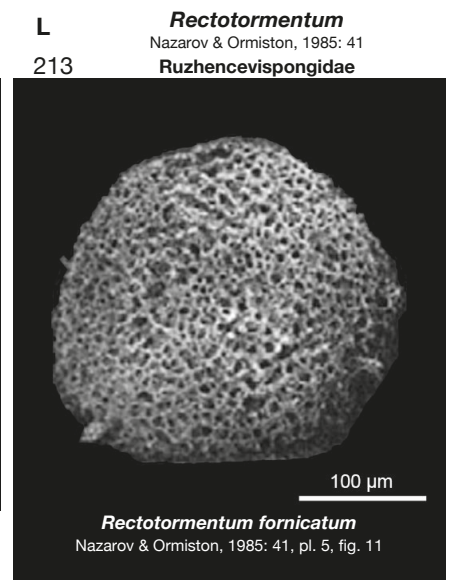
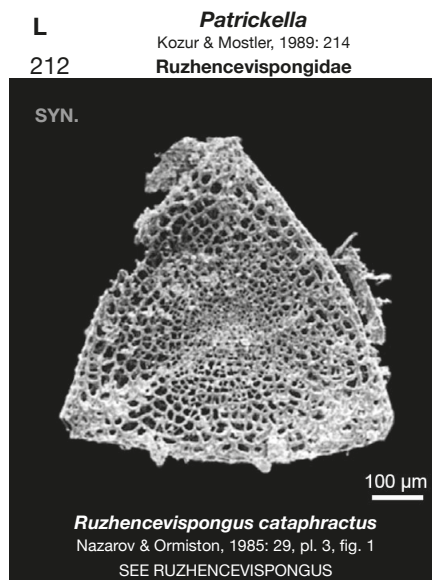
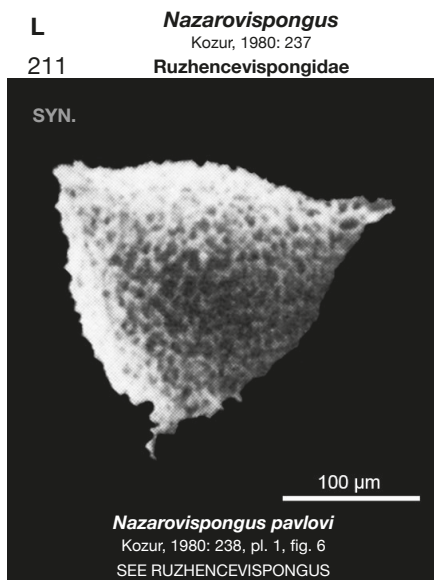
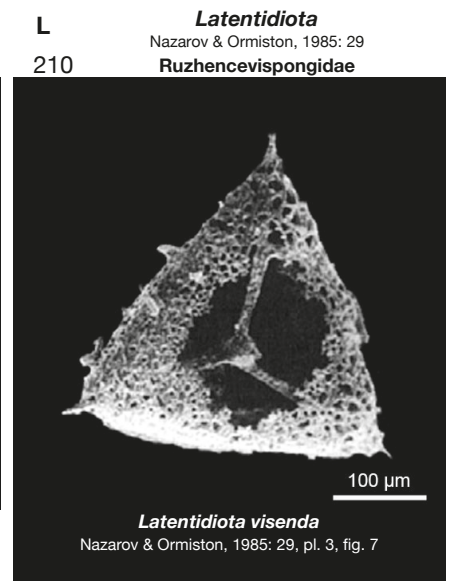
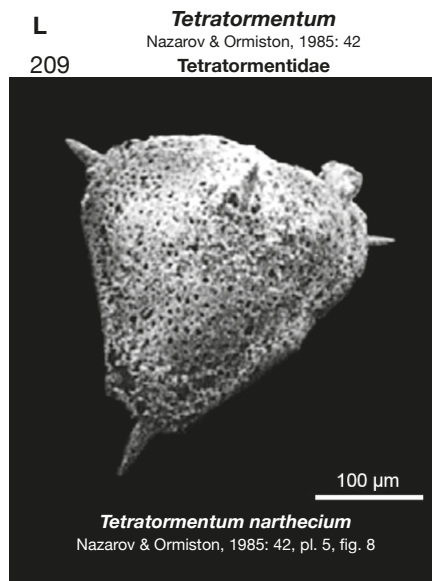
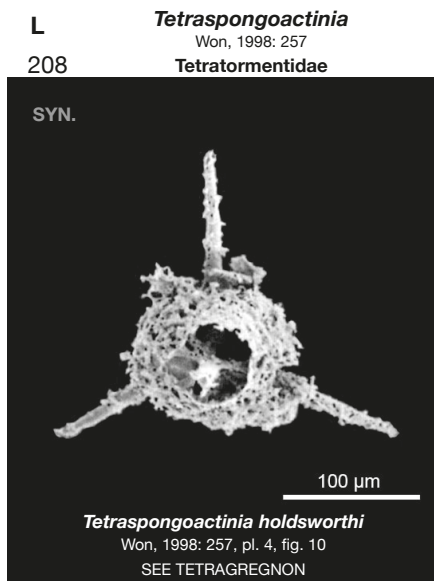


L
206
Tetracircinata
Nazarov & Ormiston, 1984: 74
Tetratortentidae

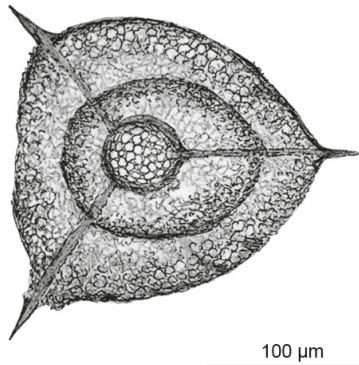


L
207
Tetragregnon
Ormiston & Lane, 1976: 167
Tetratortentidae





L
217 *Wonio*
Özdikmen, 2009: 247
Ruzhencevispongidae

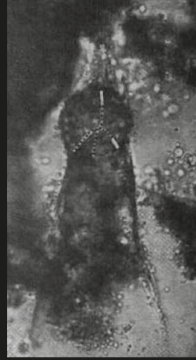


100 µm

Spongotripus concentricus
Rüst, 1892: 173, pl. 25, fig. 4

N
218 *Allocyrtium*
Afanasieva, 1986: 31
Archocyrtiidae

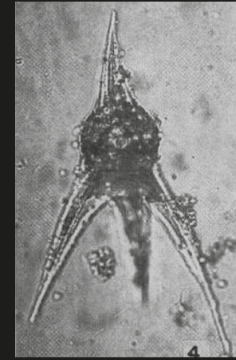
SYN.



100 µm

Archocyrtium castuligerum
Deflandre, 1972a: pl. 4, fig. 6; Deflandre, 1972b: 15
SEE ARCHOCYRTIUM

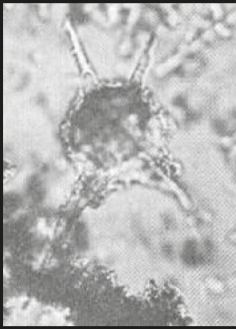
N
219 *Archocyrtium*
Deflandre, 1972b: 15
Archocyrtiidae



100 µm

Archocyrtium riedeli
Deflandre, 1972a: pl. 4, fig. 4; Deflandre, 1972b: 15

N
220 *Cerarchocyrtium*
Deflandre, 1973d: 151
Archocyrtiidae

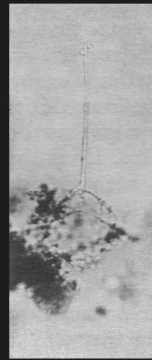


50 µm

Cerarchocyrtium ambiguum
Deflandre, 1973d: 151, pl. 4, fig. 1

N
221 *Ceratoclathrum*
Deflandre, 1960: 216
Archocyrtiidae

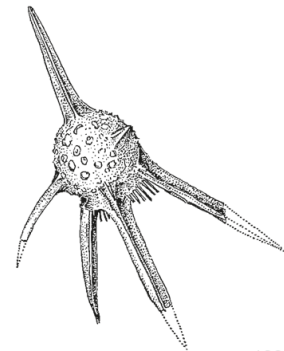
N.N.



100 µm

Ceratoclathrum ambiguum
Deflandre, 1960: 216, pl. 1, fig. 8

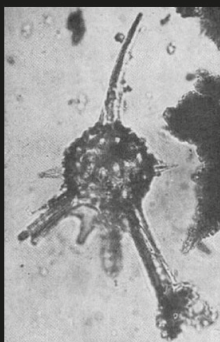
N
222 *Cyrtisphaeractenium*
Deflandre, 1972b: 14
Archocyrtiidae



100 µm

Cyrtisphaeractenium mendax
Deflandre, 1972a: pl. 1, fig. 10; Deflandre, 1972b: 15

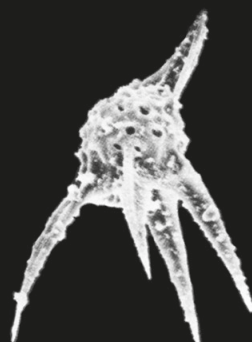
N
223 *Cyrtisphaeronemium*
Deflandre, 1972b: 14
Archocyrtiidae



100 µm

Cyrtisphaeronemium prudentigerum
Deflandre, 1972a: pl. 2, fig. 1; Deflandre, 1972b: 14

N
224 *Deflandrellium*
Cheng, 1986: 134
Archocyrtiidae



100 µm

Deflandrellium georgesi
Cheng, 1986: 134, pl. 7, fig. 7

N
225 *Foremaniella*
Deflandre, 1972b: 14
Archocyrtiidae



100 µm

Cyrtentactinia cibdelosphaera
Foreman, 1963: 285, pl. 8, fig. 3

N
226

Mostlerium
Cheng, 1986: 136
Archocyrtiidae

SYN.



100 µm

Mostlerium unicum
Cheng, 1986: 136, pl. 4, fig. 8
SEE PARARCHOCYRTIUM

N
227

Pararchocyrtium
Deflandre, 1972b: 15
Archocyrtiidae



100 µm

Pararchocyrtium mirabile
Deflandre, 1972a: pl. 4, fig. 1; Deflandre, 1972b: 15

N
228

Robotium
Cheng, 1986: 137
Archocyrtiidae

SYN.

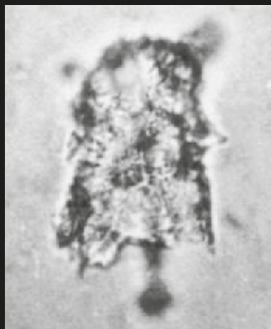


100 µm

Robotium validum
Cheng, 1986: 139, pl. 3, fig. 11
SEE PARARCHOCYRTIUM

N
229

Cyrtentactinia
Foreman, 1963: 284
Popofskyellidae



100 µm

Cyrtentactinia primotica
Foreman, 1963: 285, pl. 8, fig. 2a

N
230

Kantollum
Cheng, 1986: 163
Popofskyellidae



100 µm

Kantollum pittsburgense
Cheng, 1986: 164, pl. 2, fig. 4

N
231

Popofskyellum
Deflandre, 1964: 3058
Popofskyellidae

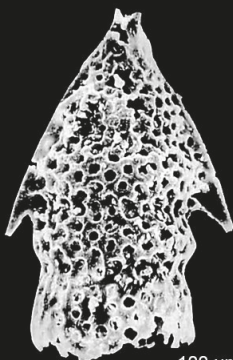


100 µm

Popofskyellum pulchrum
Deflandre, 1964: fig. 1

N
232

Totollum
Schwartzapfel & Holdsworth, 1996: 142
Popofskyellidae

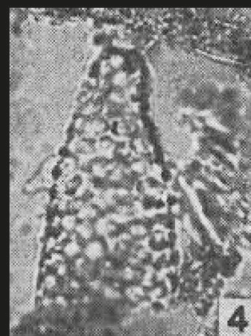


100 µm

Totollum blomei
Schwartzapfel & Holdsworth, 1996: 146, pl. 10, fig. 1

N
233

Tuscaritellum
Deflandre, 1972b: 16
Popofskyellidae

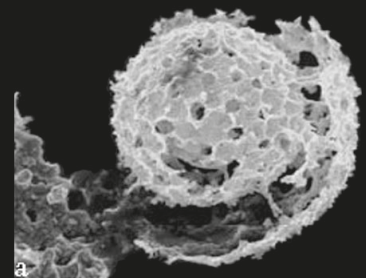


50 µm

Tuscaritellum imitatum
Deflandre, 1972a: text-fig. 4

S
234

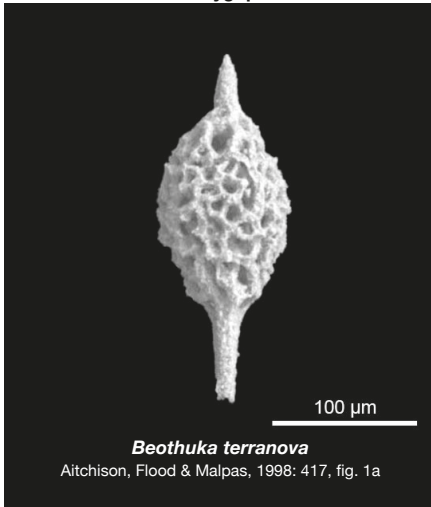
Antygopora
Maletz & Bruton, 2005: 713
Antygoporidae



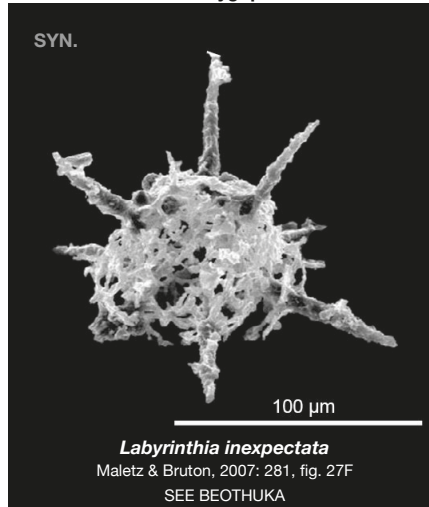
50 µm

Antygopora ordovicica
Maletz & Bruton, 2005: 715, fig. 2a

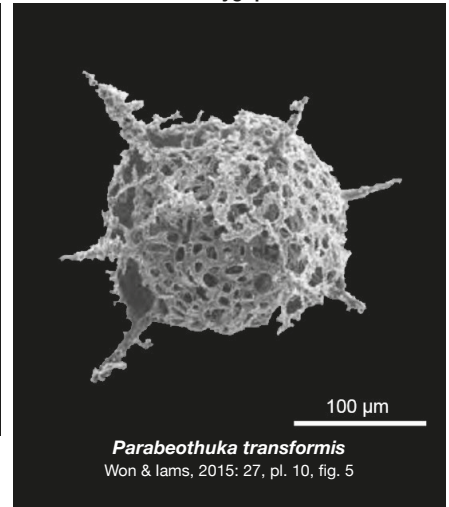
S
235
Beothuka
Aitchison, Flood & Malpas, 1998: 417
Antygoporidae



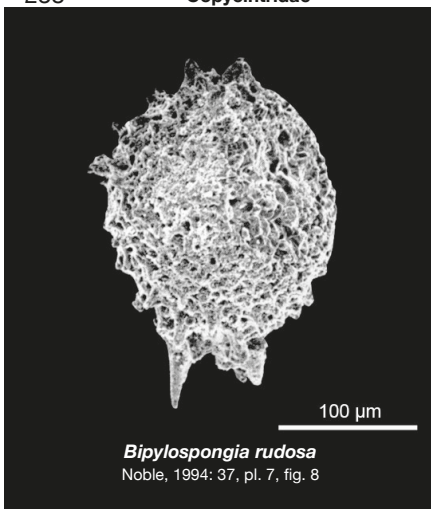
S
236
Labyrinthia
Maletz & Bruton, 2007: 281
Antygoporidae



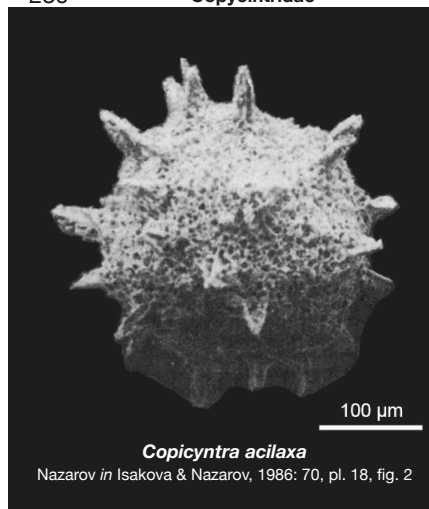
S
237
Parabeothuka
Won & Iams, 2015: 27
Antygoporidae



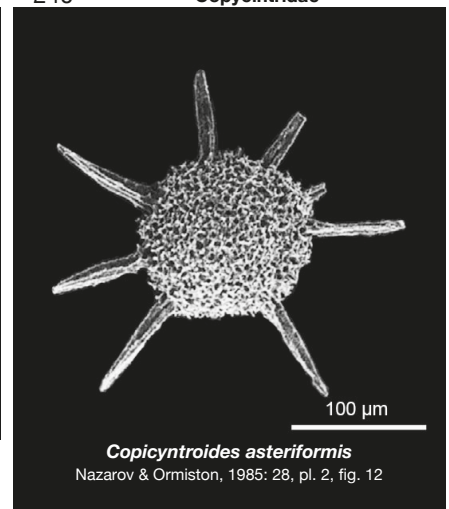
S
238
Bipylspongia
Noble, 1994: 37
Copycintridae



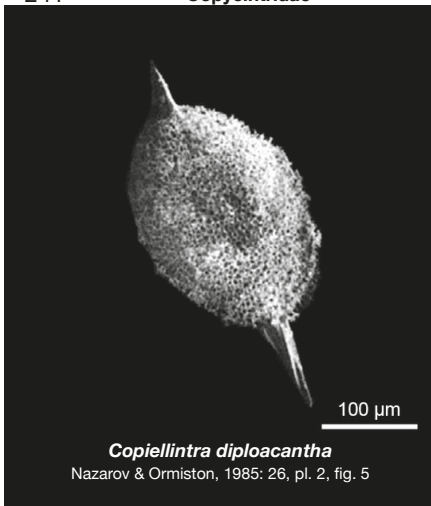
S
239
Copicyntra
Nazarov & Ormiston, 1985: 24
Copycintridae



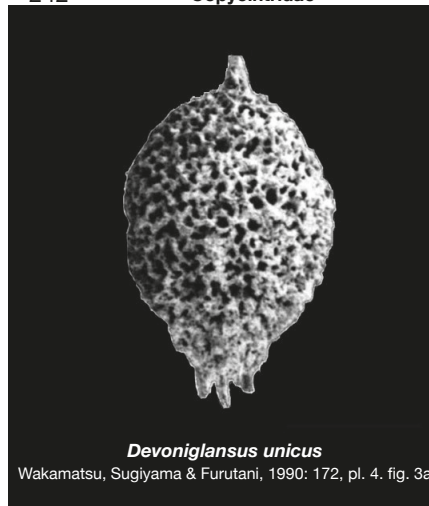
S
240
Copicyntroides
Nazarov & Ormiston, 1985: 28
Copycintridae



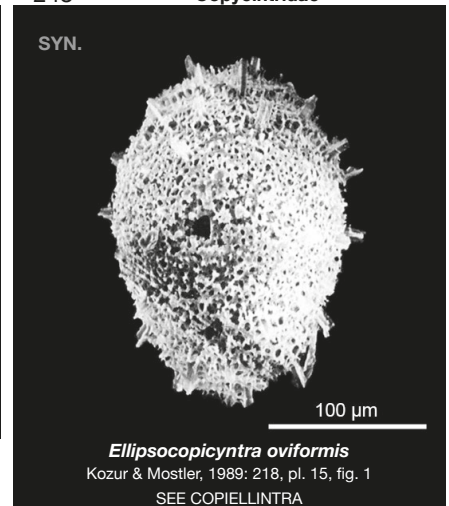
S
241
Copiellintra
Nazarov & Ormiston, 1985: 25
Copycintridae



S
242
Devoniglansus
Wakamatsu, Sugiyama & Furutani, 1990: 171
Copycintridae

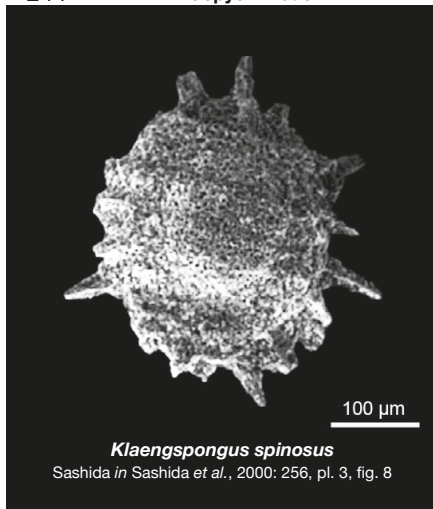


S
243
Ellipsocopicyntra
Kozur & Mostler, 1989: 218
Copycintridae



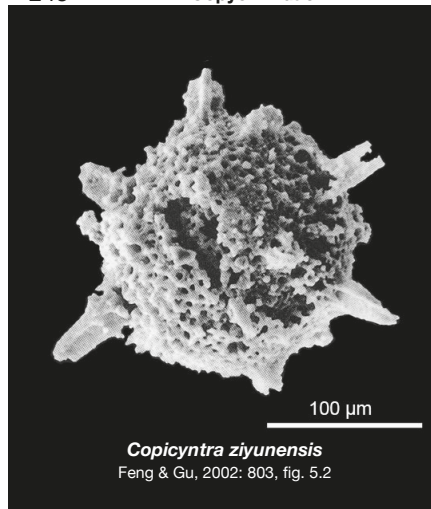
S
244

Klaengspongos
Sashida *in* Sashida *et al.*, 2000: 256
Copycintridae



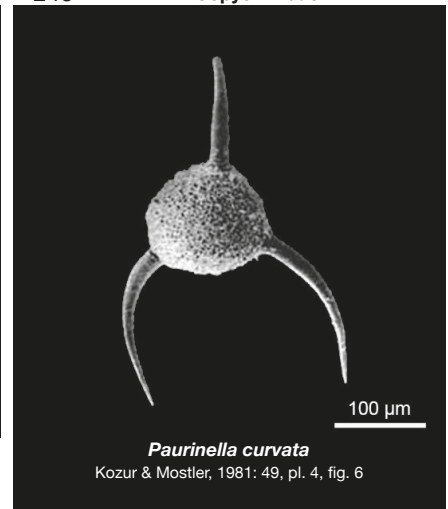
S
245

Paracopycyntra
Feng *in* Feng *et al.*, 2006a: 25
Copycintridae



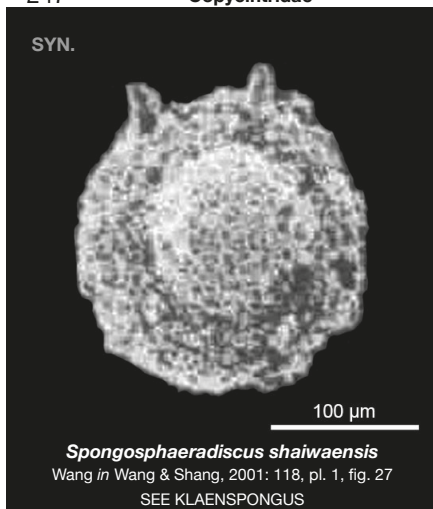
S
246

Paurinella
Kozur & Mostler, 1981: 49
Copycintridae



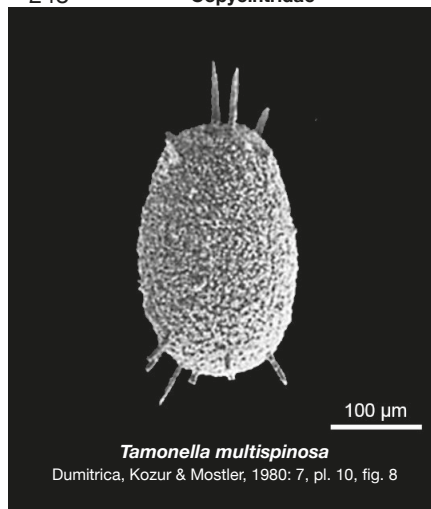
S
247

Spongospaeradiscus
Wang *in* Wang & Shang, 2001: 118
Copycintridae



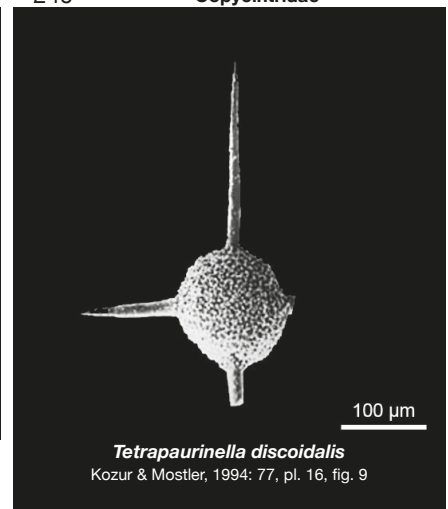
S
248

Tamonella
Dumitrica, Kozur & Mostler, 1980: 7
Copycintridae



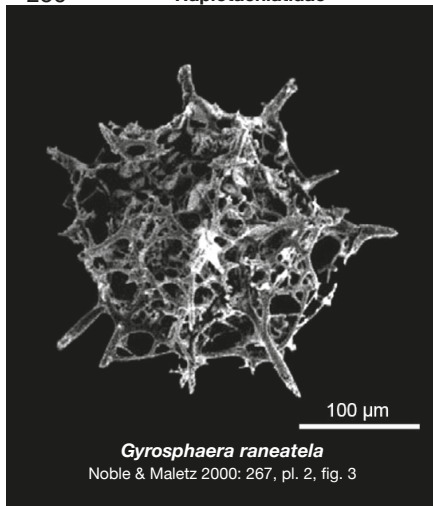
S
249

Tetrapaurinella
Kozur & Mostler, 1994: 76
Copycintridae



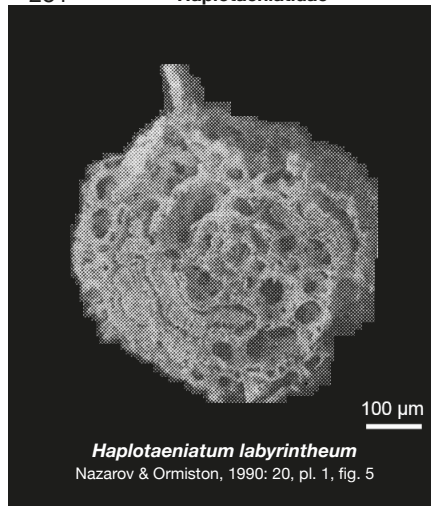
S
250

Gyrosphaera
Noble & Maletz 2000: 267
Haplotaeniidae



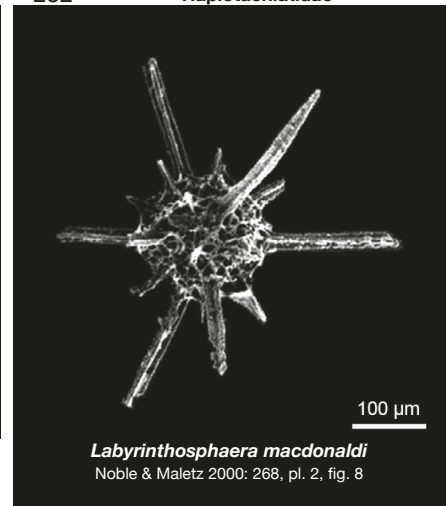
S
251

Haplotaeniatum
Nazarov & Ormiston, 1990: 19
Haplotaeniidae

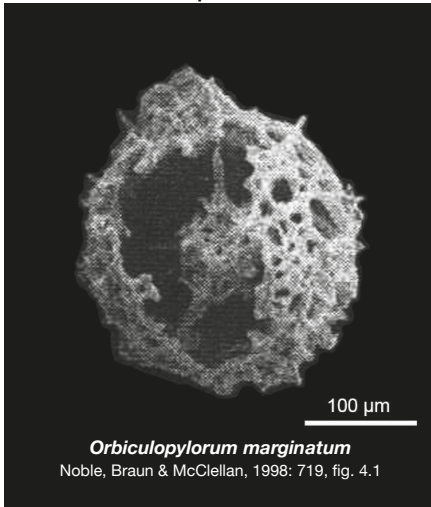


S
252

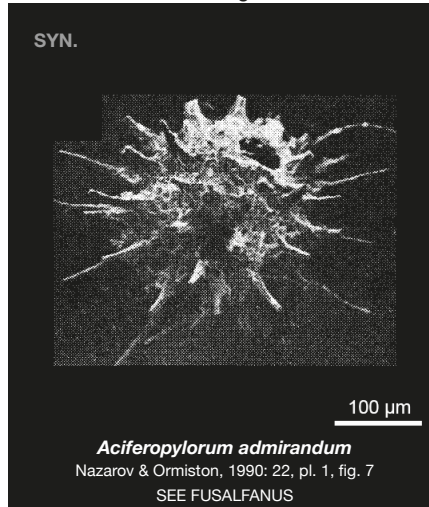
Labyrinthosphaera
Noble & Maletz 2000: 268
Haplotaeniidae



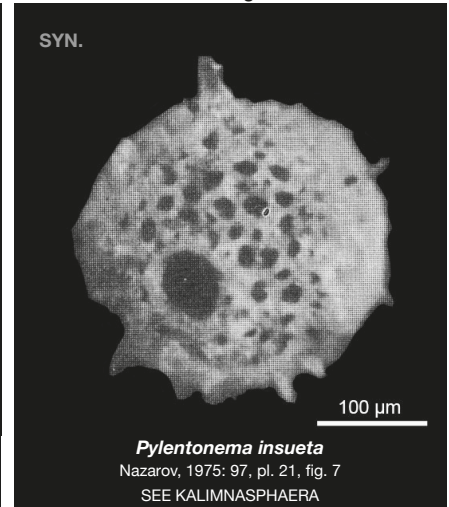
S
253 *Orbiculopylorum*
Noble, Braun & McClellan, 1998: 718
Haplotaeniidae



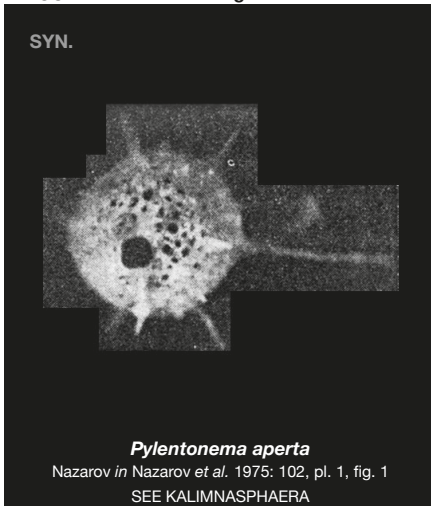
S
254 *Aciferopylorum*
Nazarov & Ormiston, 1990: 21
Inaniguttidae



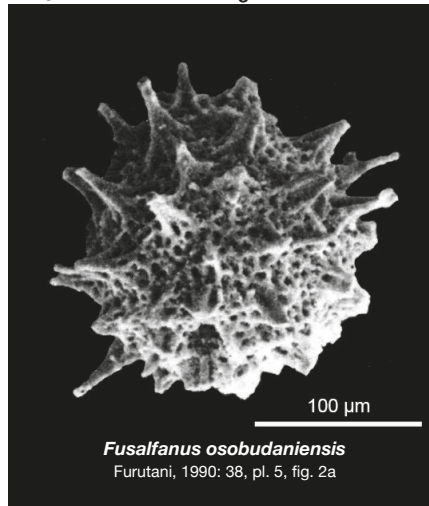
S
255 *Cessipylarum*
Nazarov in Afanasieva, 1986: 30
Inaniguttidae



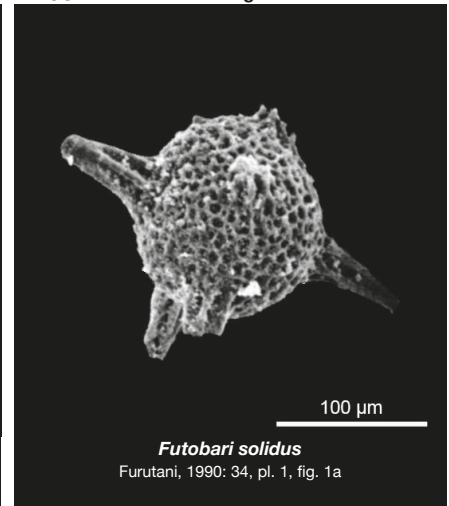
S
256 *Cessipylarum*
Nazarov & Ormiston in Nazarov, 1988: 70
Inaniguttidae



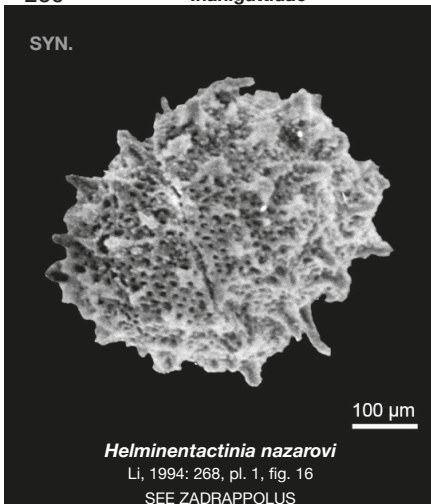
S
257 *Fusalfanus*
Furutani, 1990: 38
Inaniguttidae



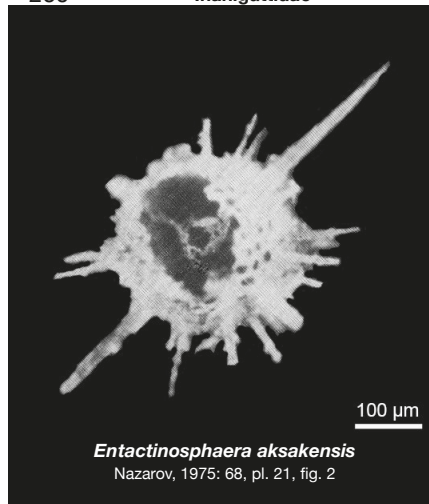
S
258 *Futobari*
Furutani, 1990: 34
Inaniguttidae



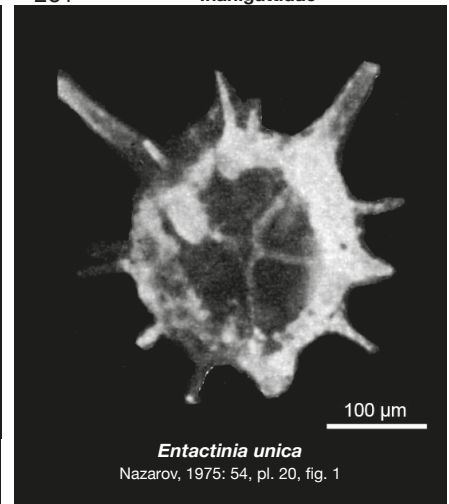
S
259 *Helminentactinia*
Li, 1994: 268
Inaniguttidae



S
260 *Inanibigutta*
Nazarov & Ormiston in Nazarov, 1988: 56
Inaniguttidae

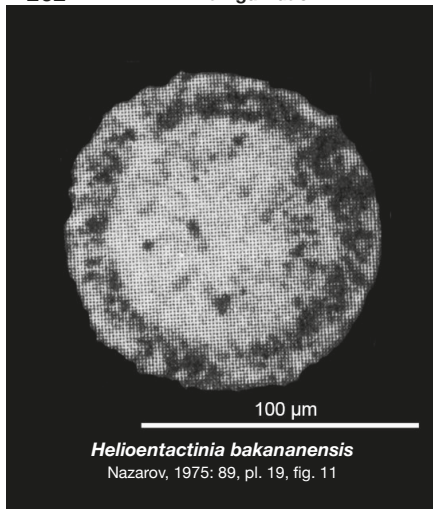


S
261 *Inanigutta*
Nazarov & Ormiston, 1984: 72
Inaniguttidae



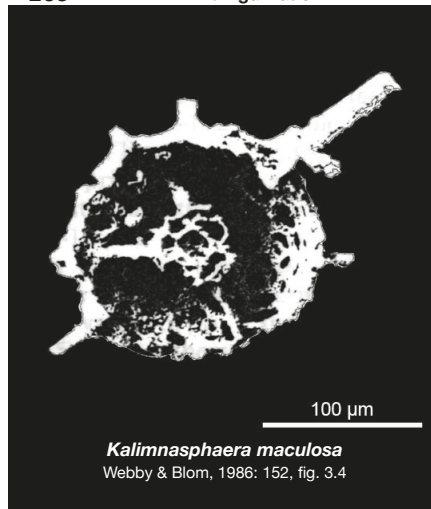
S
262

Inanihella
Nazarov & Ormiston, 1984: 72
Inaniguttidae



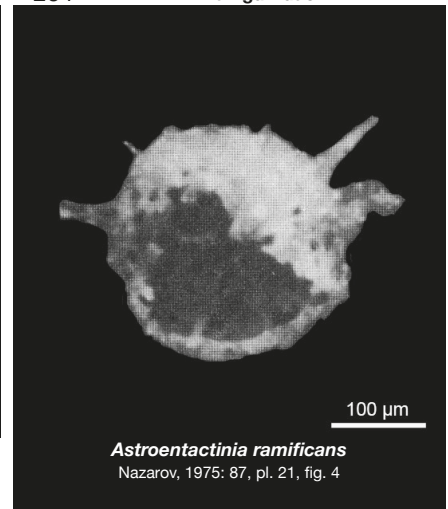
S
263

Kalimnasphaera
Webby & Blom, 1986: 152
Inaniguttidae



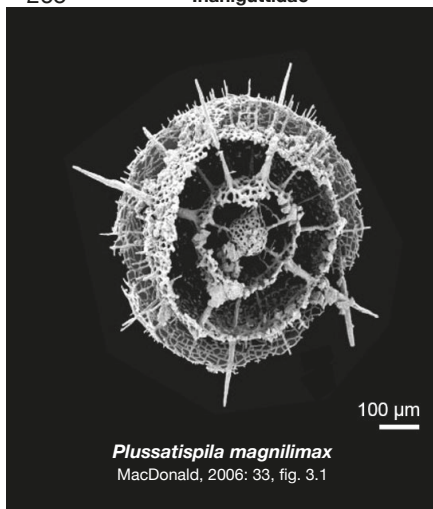
S
264

Oriundogutta
Nazarov & Ormiston in Nazarov, 1988: 57
Inaniguttidae



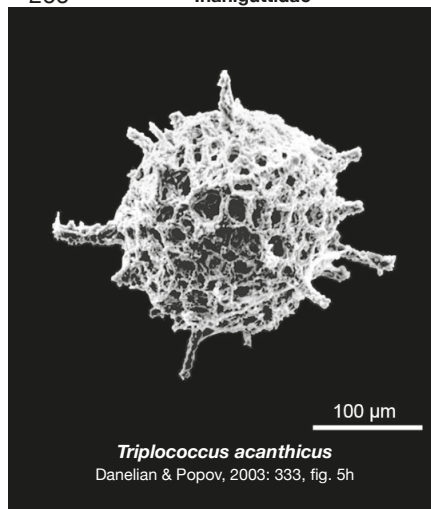
S
265

Plussatispila
MacDonald, 2006: 33
Inaniguttidae



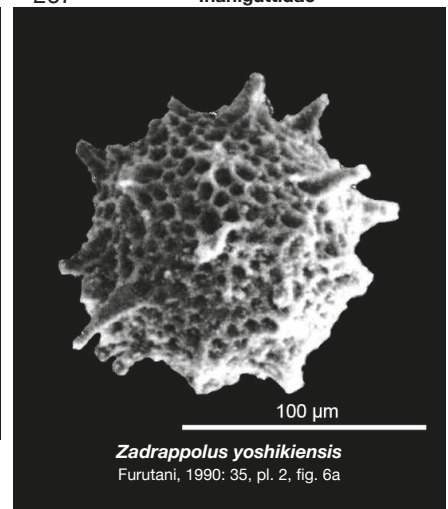
S
266

Triplococcus
Danelian & Popov, 2003: 333
Inaniguttidae



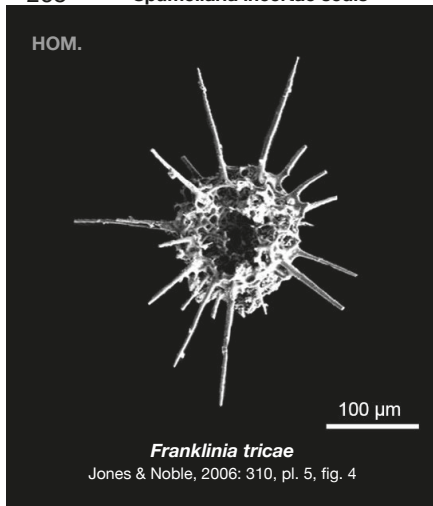
S
267

Zadrappolus
Furutani, 1990: 35
Inaniguttidae



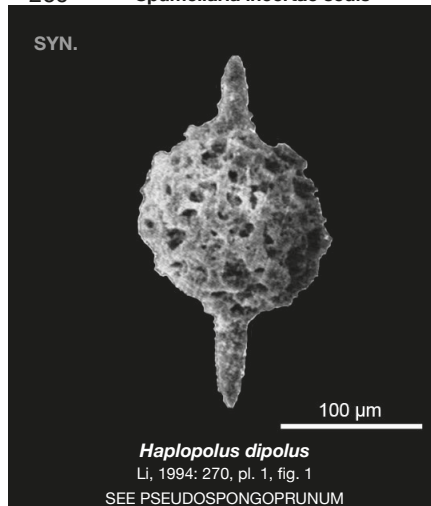
S
268

Franklinia
Jones & Noble, 2006: 308
Spumellaria incertae sedis



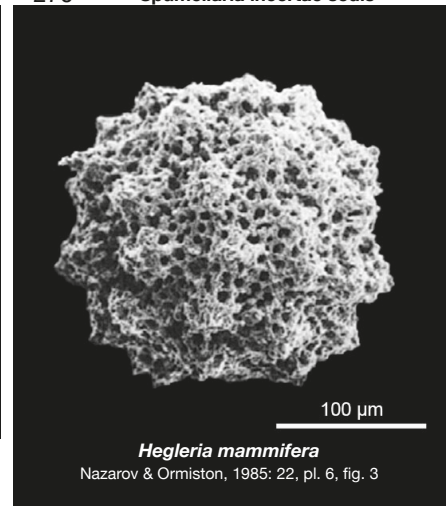
S
269

Haplopolus
Li, 1994: 270
Spumellaria incertae sedis

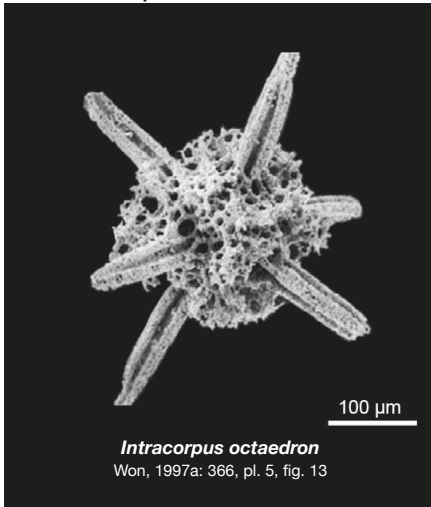


S
270

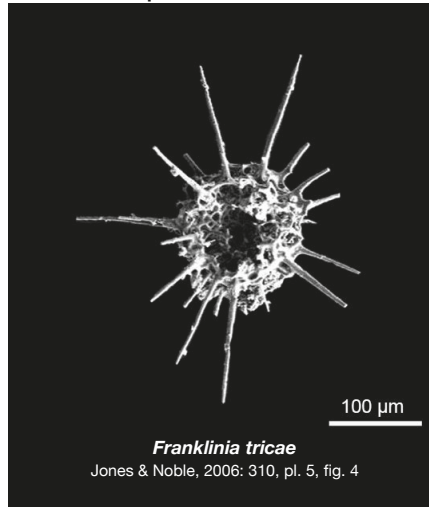
Hegleria
Nazarov & Ormiston, 1985: 22
Spumellaria incertae sedis



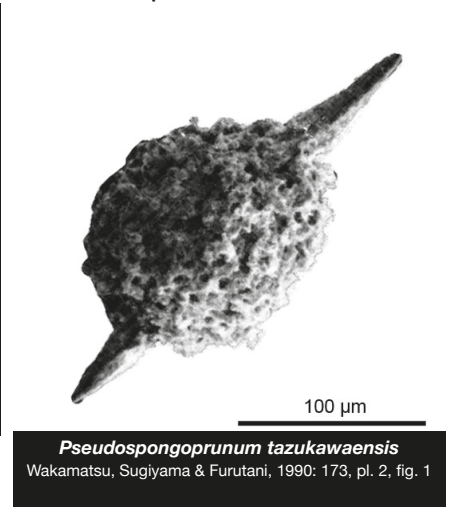
S
271 *Intracarpus*
Won, 1997a: 366
Spumellaria incertae sedis



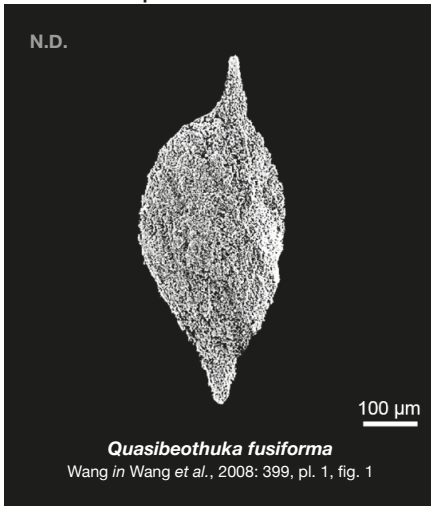
S
272 *Maletzella*
Noble, 2014: 35
Spumellaria incertae sedis



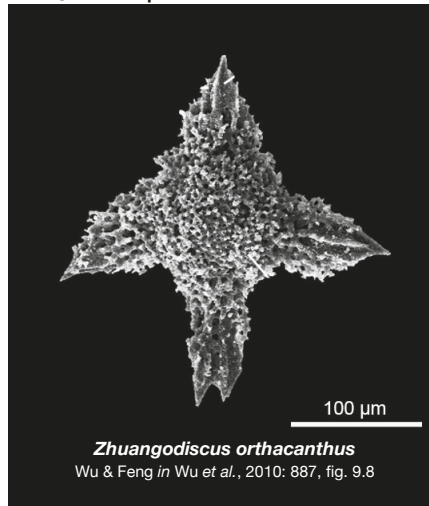
S
273 *Pseudospongoprimum*
Wakamatsu, Sugiyama & Furutani, 1990: 172
Spumellaria incertae sedis



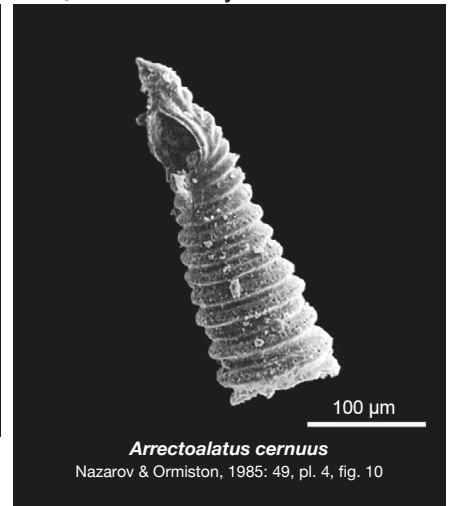
S
274 *Quasibeothuka*
Wang in Wang et al., 2008: 399
Spumellaria incertae sedis



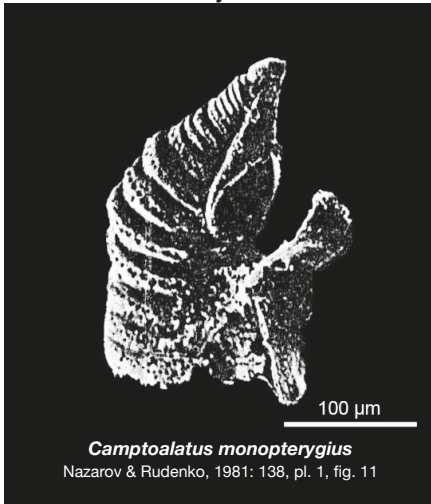
S
275 *Zhuangodiscus*
Wu & Feng in Wu et al., 2010: 887
Spumellaria incertae sedis



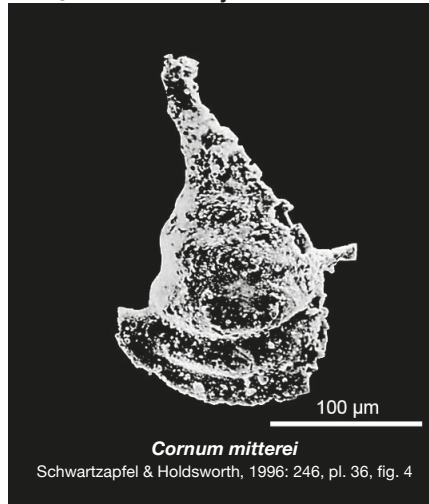
S
276 *Arrectoalatus*
Nazarov & Ormiston, 1985: 49
Corythoecidae



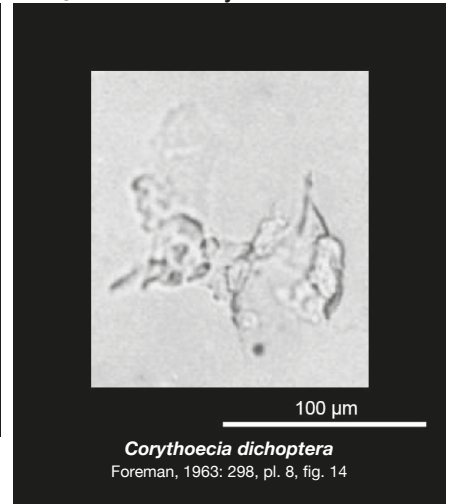
S
277 *Camptoalatus*
Nazarov & Rudenko, 1981: 138
Corythoecidae

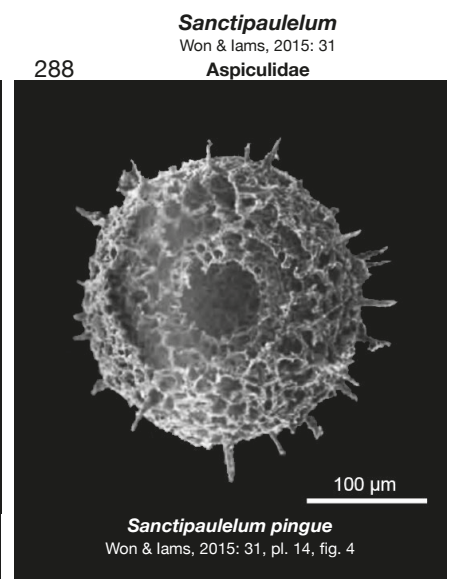
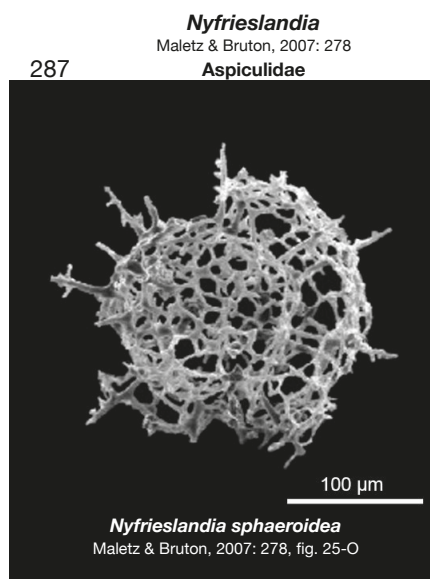
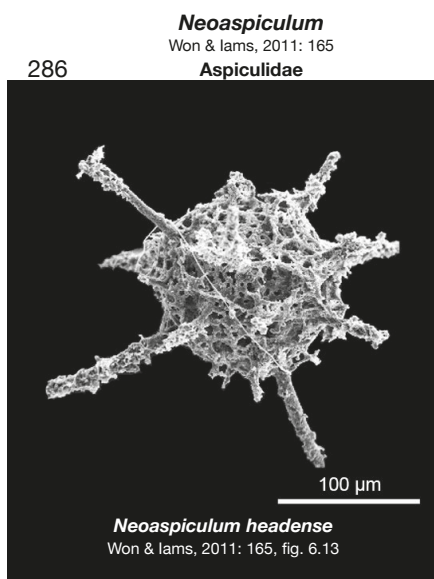
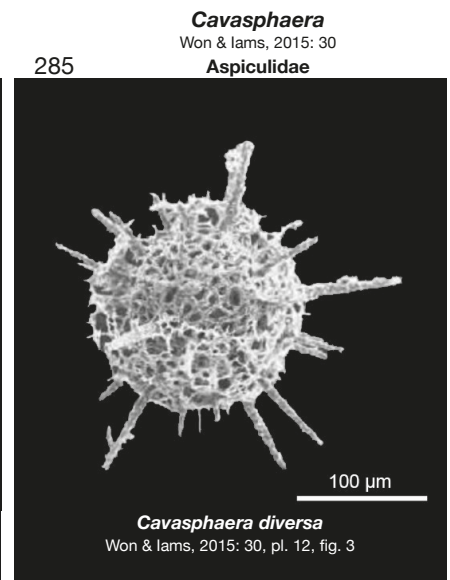
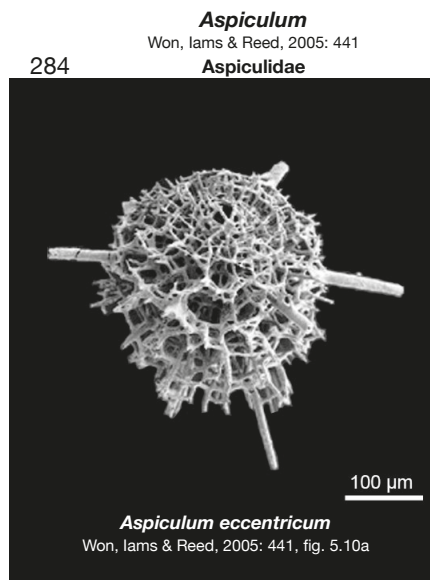
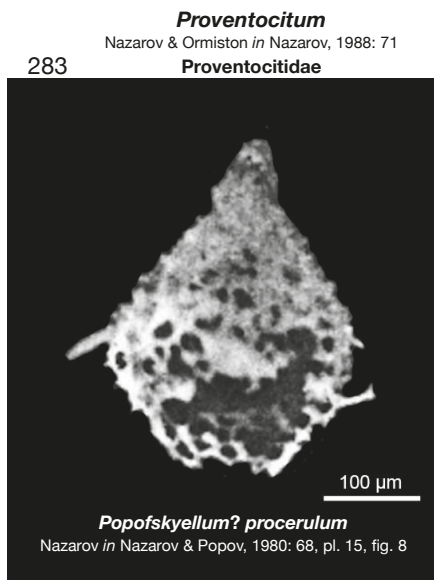
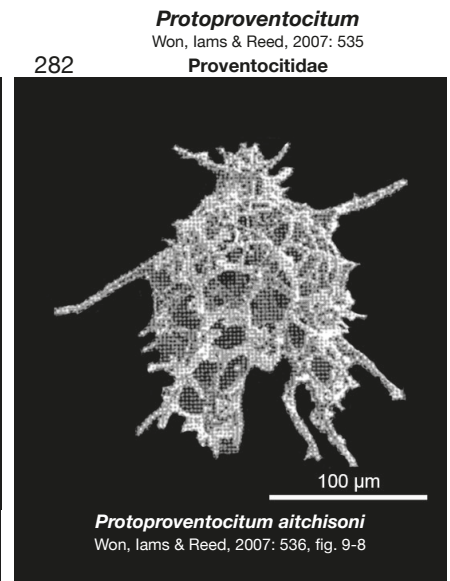
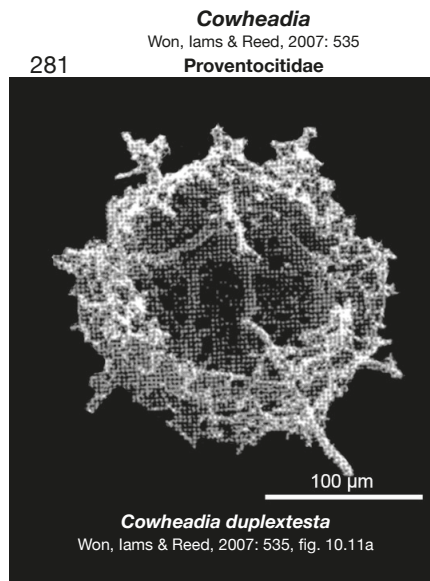
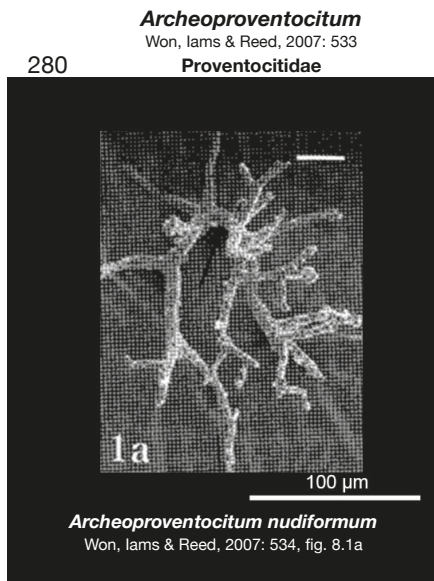


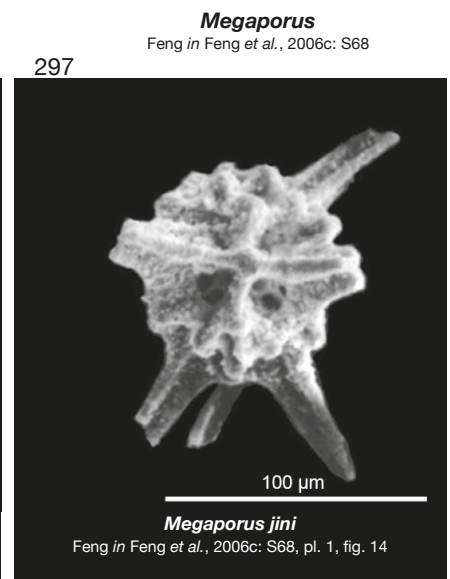
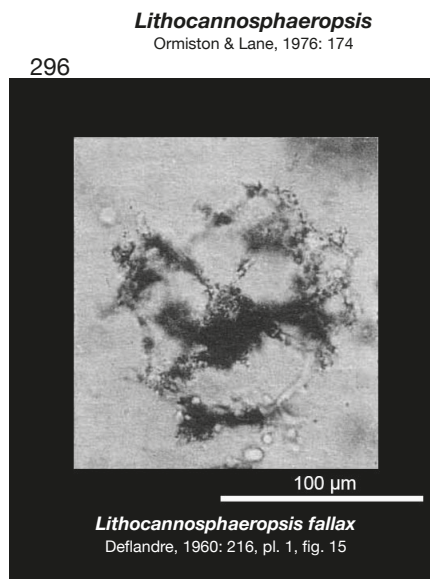
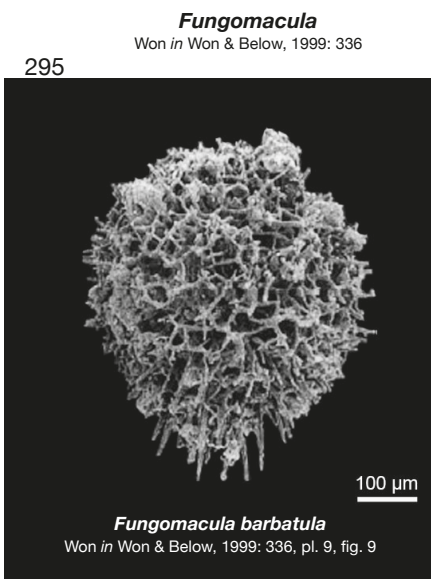
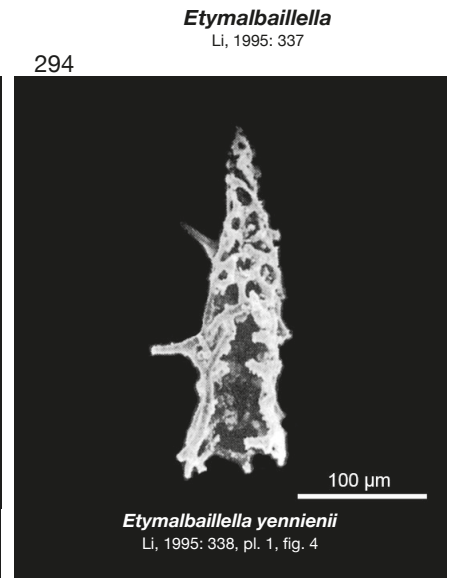
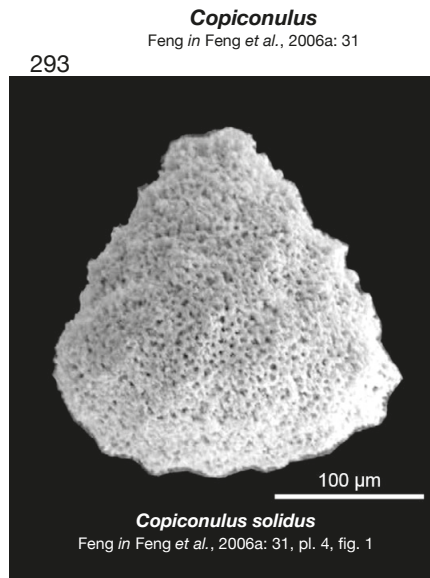
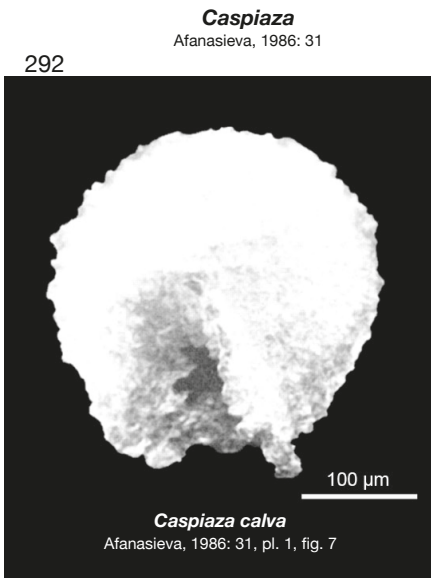
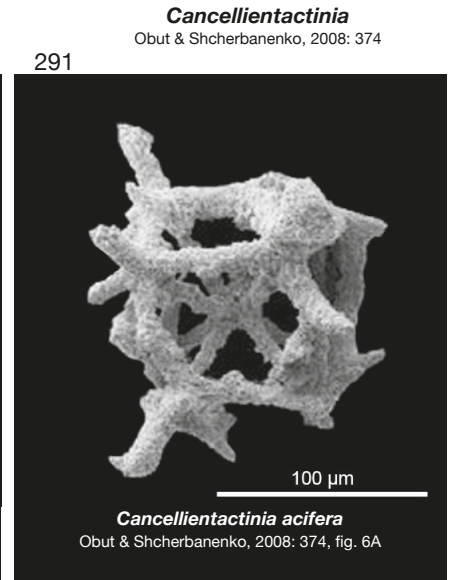
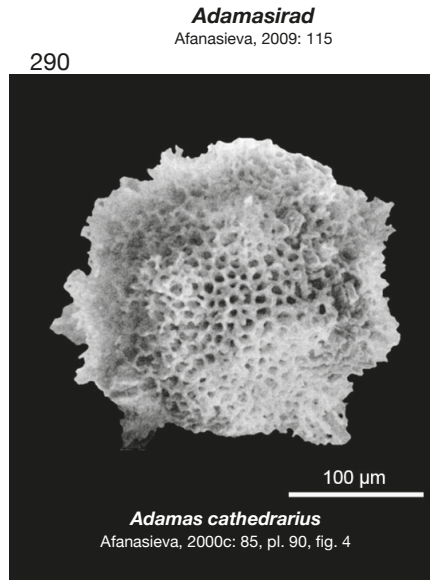
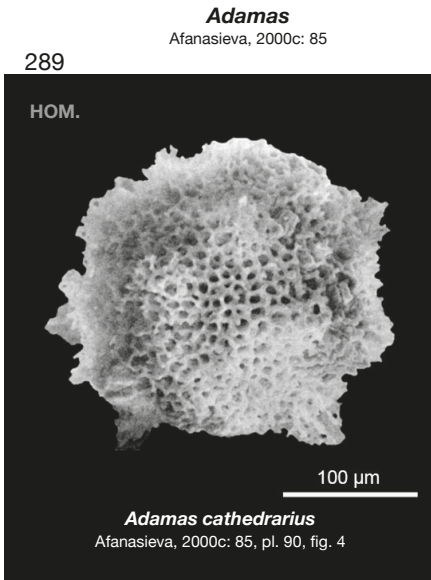
S
278 *Cornum*
Schwartzapfel & Holdsworth, 1996: 230
Corythoecidae



S
279 *Corythoecia*
Foreman, 1963: 298
Corythoecidae

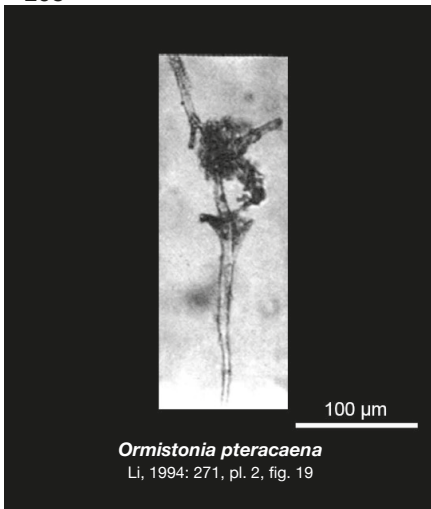






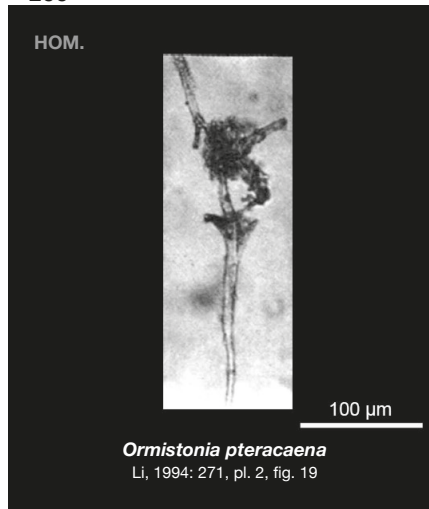
Novormistonina
Özdikmen, 2009: 246

298



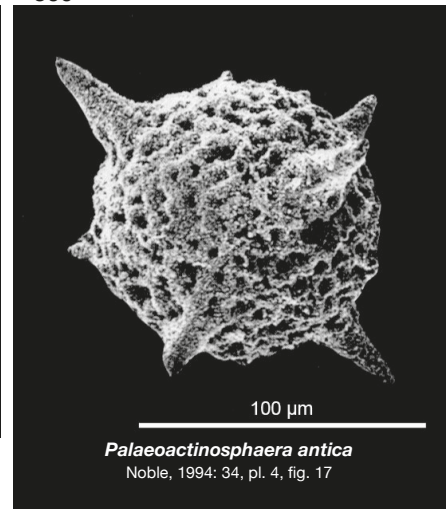
Ormistonina
Li, 1994: 270

299



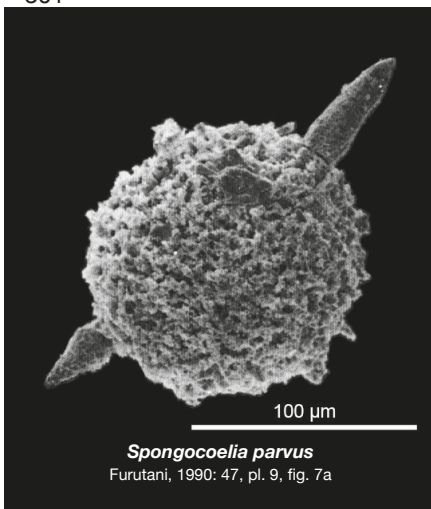
Palaeoactinosphaera
Noble, 1994: 33

300



Praespongocoelia
Noble, 1994: 38

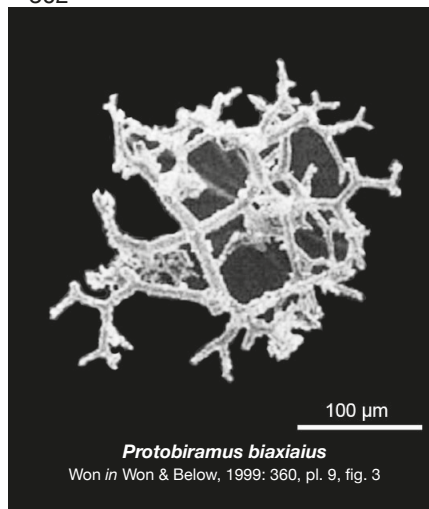
301



Protobiramus

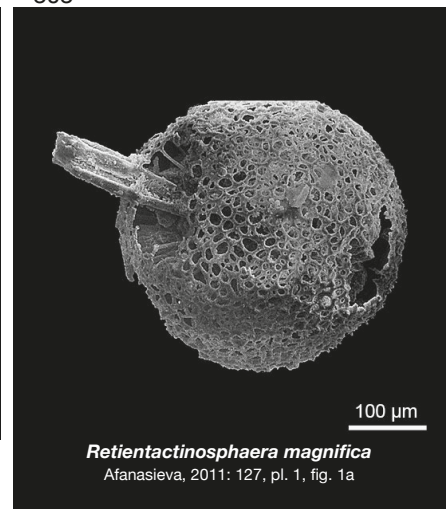
Won in Won & Below, 1999: 358

302



Retientactinosphaera
Afanasieva, 2011: 127

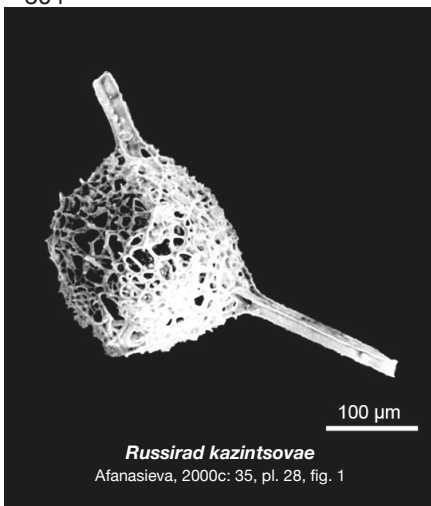
303



Russirad

Afanasieva, 2000c: 35

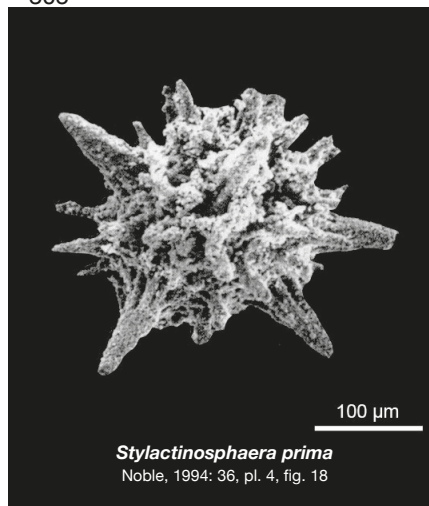
304



Stylactinosphaera

Noble, 1994: 36

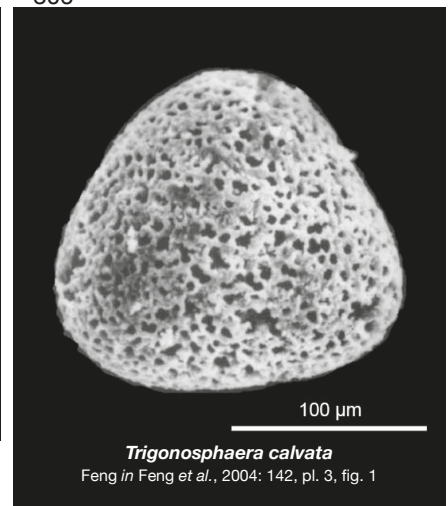
305

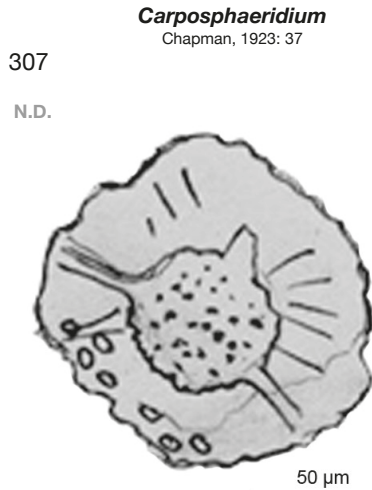


Trigonosphaera

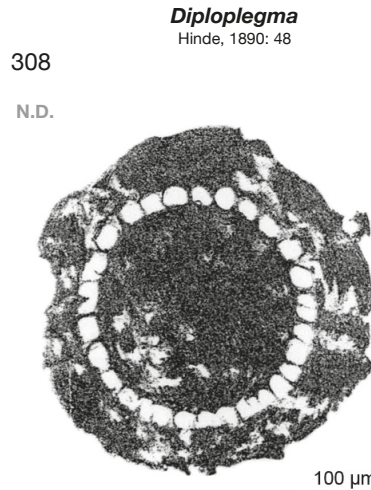
Feng in Feng *et al.*, 2004: 137

306

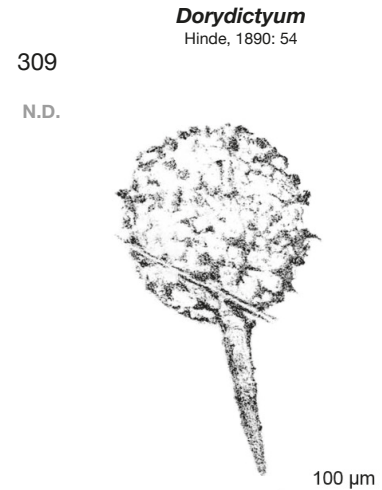




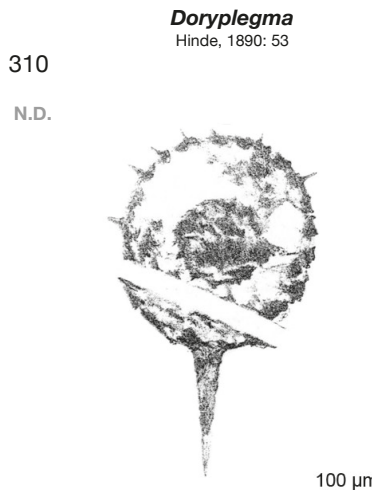
Carposphaeridium cambrense
Chapman, 1923: 37, pl. 12, fig. 1



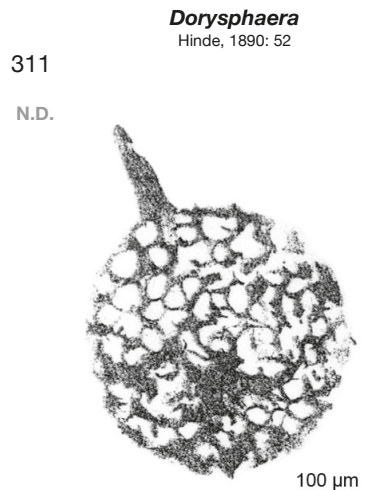
Diploplegma cinctum
Hinde, 1890: 48, pl. 3, fig. 10



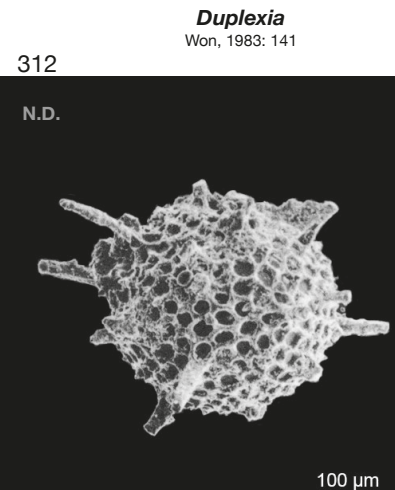
Dorydictyum simplex
Hinde, 1890: 54, pl. 3, fig. 7



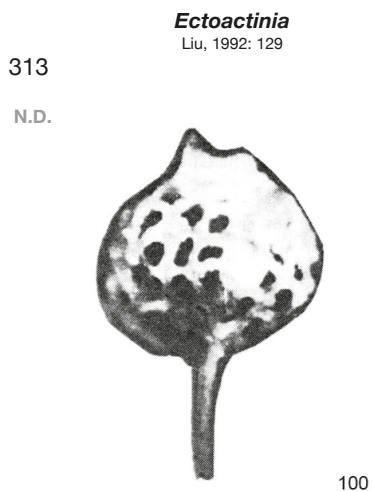
Doryplegma nasutum
Hinde, 1890: 53, pl. 3, fig. 9



Dorysphaera reticulata
Hinde, 1890: 52, pl. 4, fig. 3



Entactinosphaera foremanae
Ormiston & Lane, 1976: 166, pl. 1, fig. 9



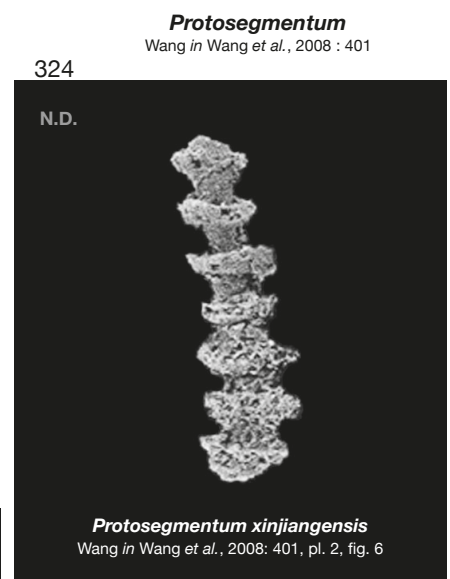
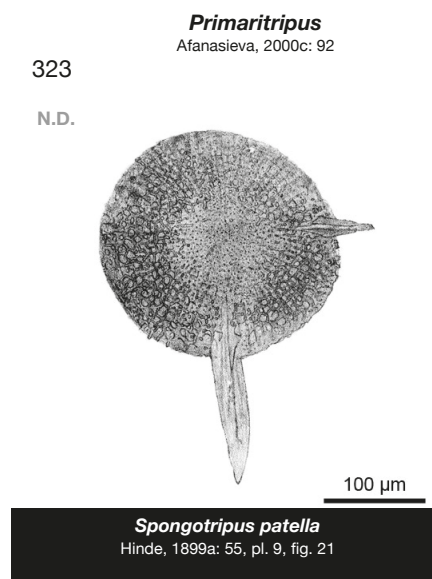
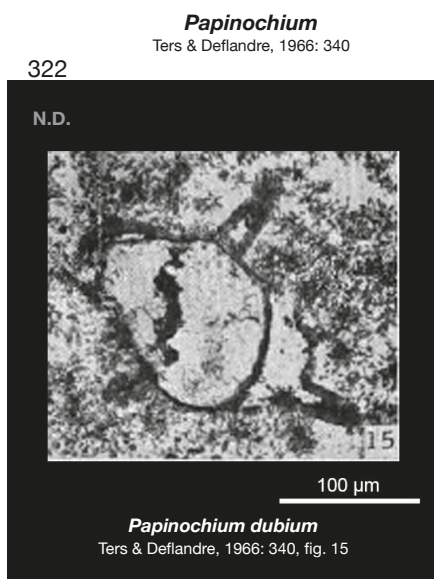
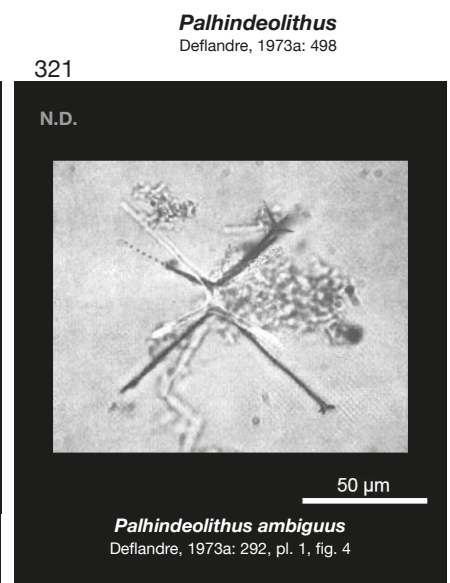
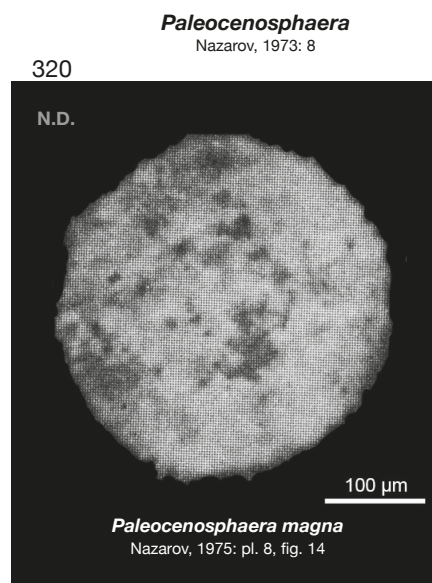
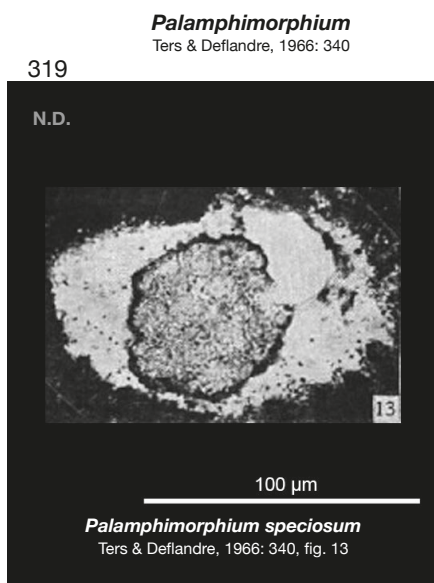
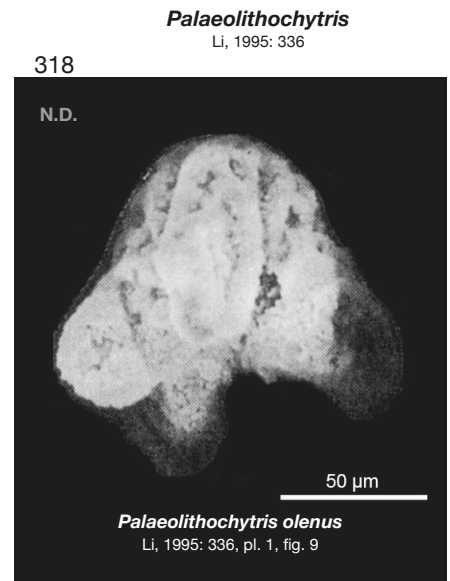
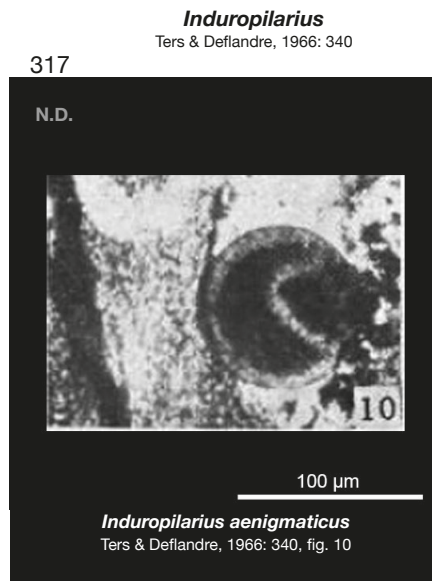
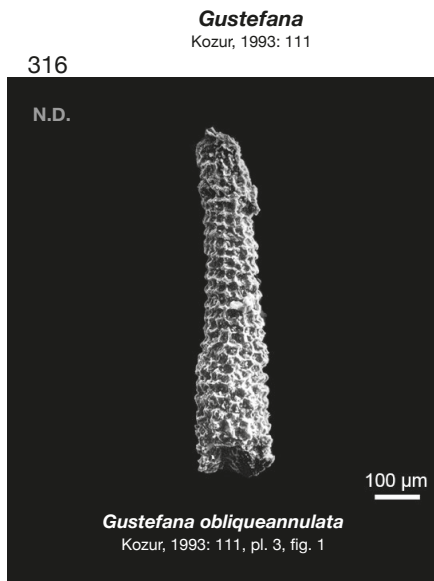
Ectoactinia tulufanensis
Liu, 1992: 129, pl. 1, fig. 1



Ehrenbergia baijingensis
Li, 1995: 335, pl. 1, fig. 10

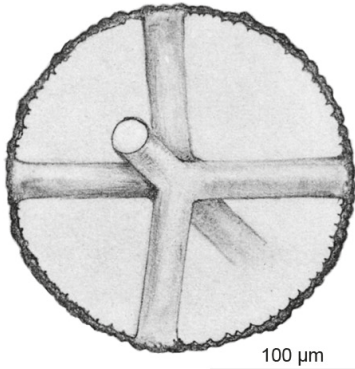


Guangxitrisphaera wanyaoensis
Wang in Wang & Kuang, 1993: 285, pl. 3, fig. 15



325 *Pseudostigmosphaera*
Kozur & Mostler, 1979: 30

N.D.

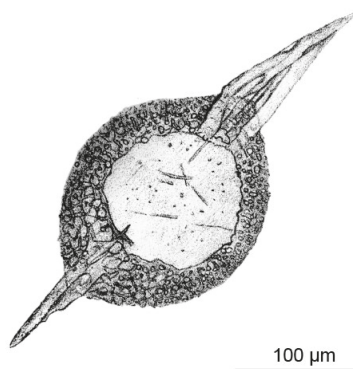


100 µm

Stigmosphaera mira
Rüst, 1892: 135, pl. 6, fig. 11

326 *Spongocoelia*
Hinde, 1899a: 52

N.D.

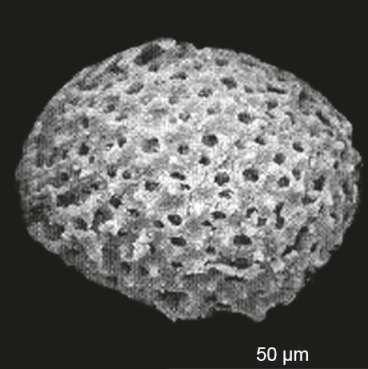


100 µm

Spongocoelia citreum
Hinde, 1899a: 52, pl. 9, fig. 18

327 *Srakaesphaera*
Sashida in Sashida et al., 1997: 12

N.D.

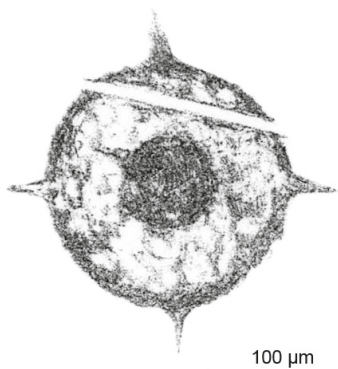


50 µm

Srakaesphaera minuta
Sashida in Sashida et al., 1997: 12, fig. 6.3

328 *Stauroplegma*
Hinde, 1890: 49

N.D.

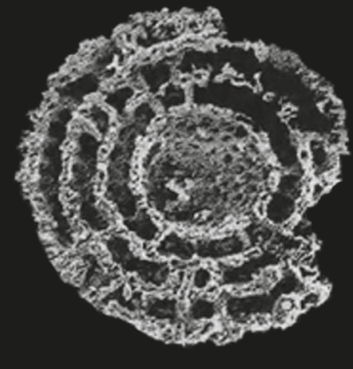


100 µm

Stauroplegma brevispina
Hinde, 1890: 50, pl. 4, fig. 5

329 *Tetrasphaera*
Wang in Wang et al., 2008 : 401

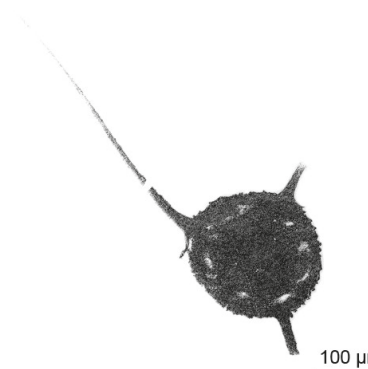
N.D.



Tetrasphaera kuruktagensis
Wang in Wang et al., 2008: 401, pl. 2, fig. 10

330 *Triplosphaera*
Hinde, 1890: 54

N.D.

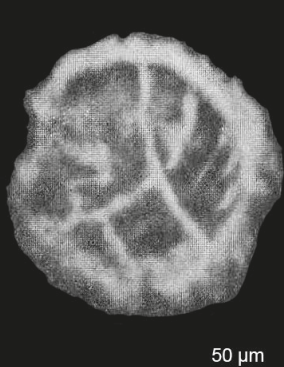


100 µm

Triplosphaera peachii
Hinde, 1890: 55, pl. 4, fig. 9

331 *Ulcundia*
Nazarov, 1974: 110

N.D.

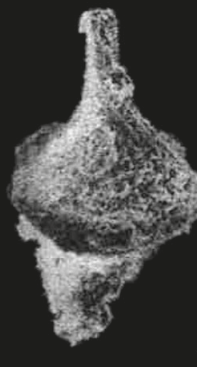


50 µm

Ulcundia incompta
Nazarov, 1974: 111, pl. 2, fig. 5

332 *Wangia*
Feng & Liu, 1993b: 544

N.D.

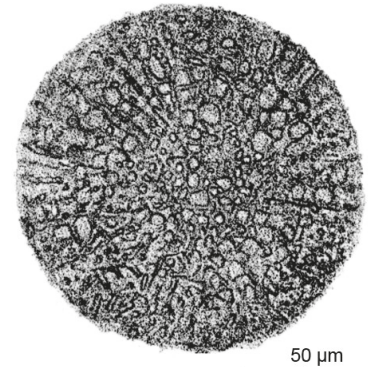


100 µm

Wangia biturbinata
Feng & Liu, 1993b: 544, pl. 1, fig. 18

333 *Palaeodiscalsus*
Afanasieva, 2008: 101

N.D.

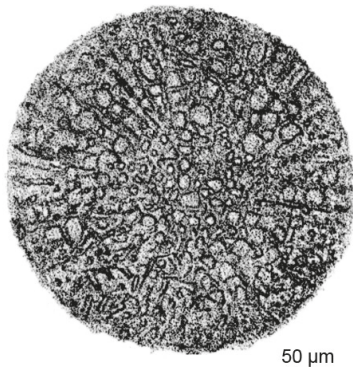


50 µm

Spongodiscus punctus
Hinde, 1899a: 54, pl. 9, fig. 14

334 *Palaeodiscus*
Afanasyeva, 2000c: 91

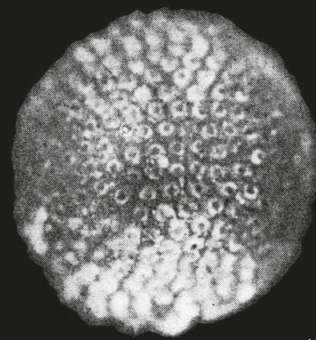
N.D.



50 µm

Spongodiscus punctus
Hinde, 1899a: 54, pl. 9, fig. 14

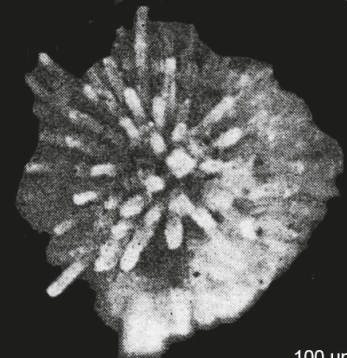
335 *Anakrusa*
Nazarov, 1977: 38
Not Radiolaria



100 µm

Anakrusa miriacantha
Nazarov, 1977: 38, pl. 1, fig. 1

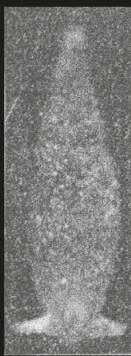
336 *Auliela*
Nazarov, 1977: 39
Not Radiolaria



100 µm

Auliela aspersa
Nazarov, 1977: 40, pl. 1, fig. 5

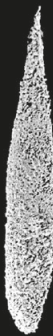
337 *Azyrtalia*
Nazarov, 1973: 11
Not Radiolaria



100 µm

Azyrtalia dilata
Nazarov, 1973: 12, pl. 1, fig. 11

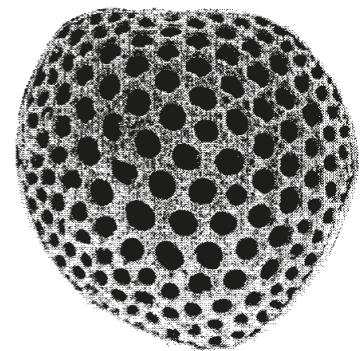
338 *Batoballa*
Wang *et al.*, 2008: 396
Not Radiolaria



Batoballa communis

Wang *in* Wang *et al.*, 2008: 396, pl. 2, fig. 2

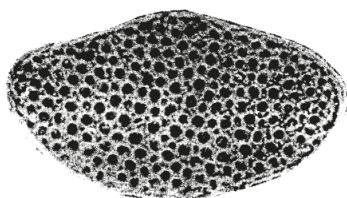
339 *Eoconcharium*
Hao & Shu, 1987: 308
Not Radiolaria



100 µm

Eoconcharium chinense
Hao & Shu, 1987: 309, pl. 1, fig. 3a

340 *Fusuconcharium*
Hao & Shu, 1987: 309
Not Radiolaria



Fusuconcharium typicum
Hao & Shu, 1987: 309, pl. 4, fig. 1a

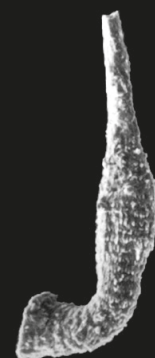
341 *Konyrium*
Nazarov & Popov, 1976: 41
Not Radiolaria



Konyrium varium

Nazarov & Popov, 1976: 41, pl. 3, fig. 19

342 *Lacisus*
Kozur, 1993: 109
Not Radiolaria

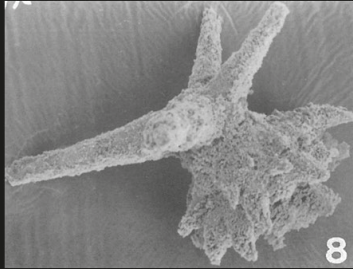


100 µm

Lacisus siphunculus
Kozur, 1993: 109, pl. 1, fig. 12

343

Palaeorubus
Ishiga *in* Ishiga *et al.*, 1987: 300
Not Radiolaria

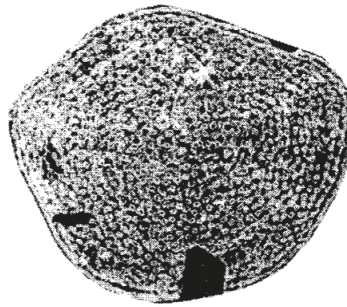


100 µm

Palaeorubus hastingsensis
Ishiga *in* Ishiga *et al.*, 1987: 300, pl. 2, fig. 8

344

Quadratapora
Hao & Shu, 1987: 309
Not Radiolaria



Quadratapora zhenbaensis
Hao & Shu, 1987: 309, pl. 4, fig. 4a