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Miocene to recent radiolarians from southern pacific coast of costa rica

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The following figures illustrate the radiolarian with the sample code and the age assignment. In the supplementary data 1 and 2 are shown the entire samples list and the radiolarian abundance.

Some of the species could not be find in this counting because it was counted within a group.

Each scale bar is 50 μm .

Radiolaria Spumellaria

Figure 2

Family Collosphaeridae Müller, 1858

A. *Acrosphaera* sp. A. U1381C 7H 6W 23–25 (middle Miocene)

B. *Acrosphaera* sp. B U1381C 7H 3W 73–75 (middle Miocene)

C. *Acrosphaera murrayana* (Haeckel) U1414 A 1H 1W 2–4 (Pleistocene)

D–E. *Siphonosphaera martensi* Brandt, D. U1414 A 29X 3W 24–26, E. U1414 A 29X 3W 24–26 (late Miocene)

F–G. *Siphonosphaera polysiphonia* Haeckel, F. U1414 A 2H 3W 23–28 (Pleistocene)

G. U1414 A 10H 2W 24–26 (Pleistocene)

H–K. *Collosphaera macropora* Popofsky, H. U1414 A 28X 7W 24–26 (late Miocene), I. U1381C 6H 1W 39–41 (middle Miocene), J. U1381C 7H 3W 73–75 (middle Miocene), K. U1381C 7H 6W 60–62 (middle Miocene)

L. *Collosphaera* sp. A U1381C 7H 6W 60–62 (middle Miocene)

M. *Collosphaera elliptica* Chen and Tan U1381C 7H 6W 45–47 (middle Miocene)

N. *Collosphaera tuberosa* Haeckel U1414A 1H 1W 2–4 (Pleistocene)

O–Q. *Otosphaera polymorpha* Haeckel, O. U1414A 25X 5W 24–26 (late Miocene), P–Q. U1381C 7H 1W 119–121 (middle Miocene)

R–S. *Otosphaera* aff. *auriculata*, R. U1414A 6H 5W 26–27, S. U1414A 1H 1W 24–26 (Pleistocene)

T. *Trisolenia zanguenica* U1381C 7H 6W 45–47 (middle Miocene)

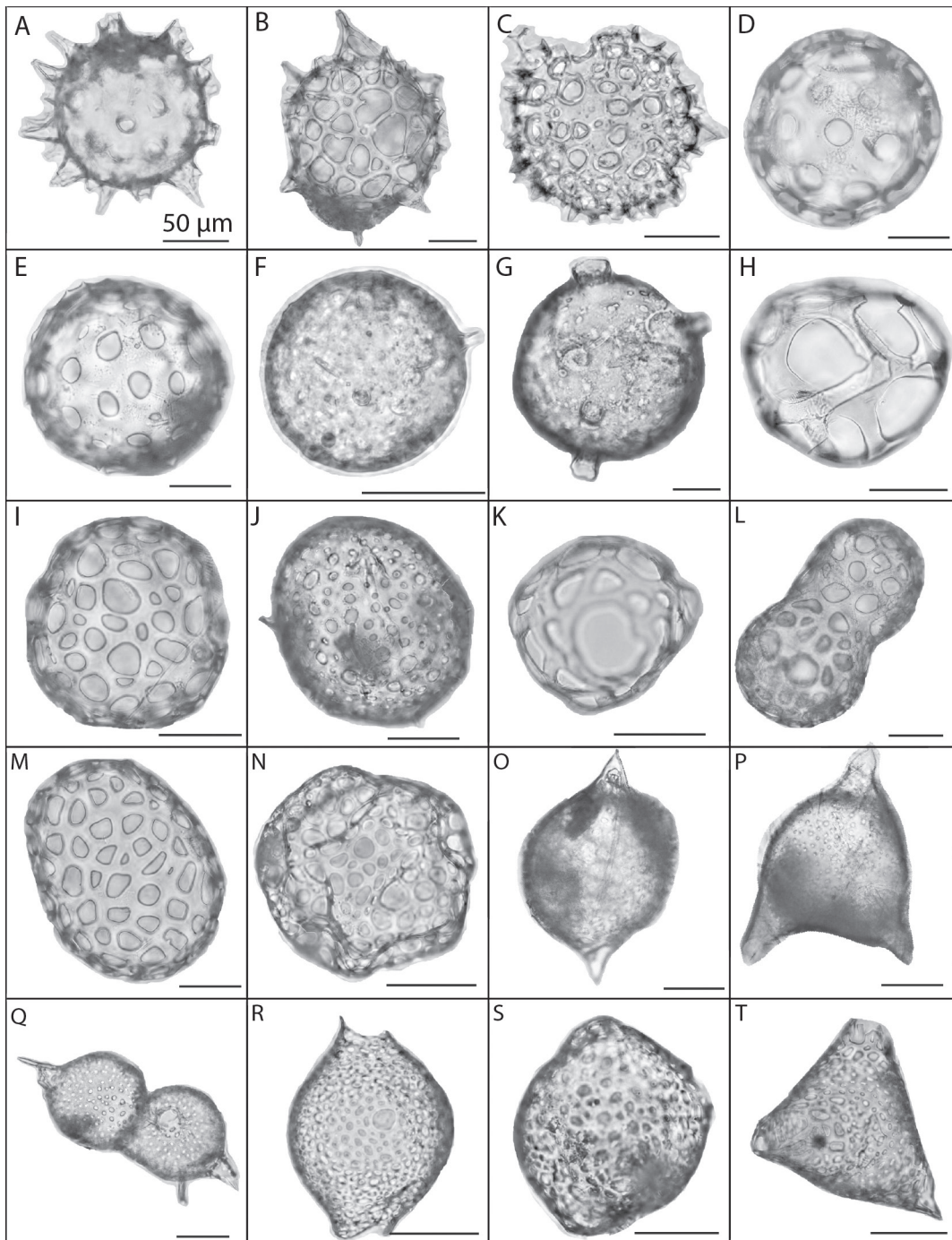


Figure 3

Family Actinommididae Haeckel, 1862, emend. Riedel, 1971

A–B. *Actinomma langii* (Dreyer), **A.** U1414A 2H 5W 17–22 (Pleistocene), **B.** U1414A 1H 1W 2–4 (Pleistocene)

C. *Cladococcus cevicornis* Haeckel U1414A 1H 1W 24–26 (Pleistocene)

D. *Diartus hughesi* (Campbell and Clark) U1414A 26X 7W 16–18 (late Miocene)

E–F. *Diartus pettersoni* Riedel and Sanfilippo, **E.** U1414A 31X 1W 24–26 (late Miocene), **F.** U1414A 29X 3W 24–26 (late Miocene)

G. *Didymocyrtis penultima* (Riedel) U1414A 22H 6W 24–26 (late Miocene)

H. *Didymocyrtis antepenultima* (Riedel and Sanfilippo) U1414A 27X 4W 24–26 (late Miocene)

I. *Didymocyrtis laticonus* (Riedel) U1381C 7H 2W 133–135 (late Miocene)

J. *Didymocyrtis mammifera* (Haeckel) U1381C 8H 3W 50–52 (late Miocene)

K. *Didymocyrtis basanii* (Carnevale) U1381C 7H 6W 45–47 (late Miocene)

L. *Didymocyrtis tetrathalamus* (Haeckel) U1414A 1H 1W 24–26 (Pleistocene)

M. *Saturnalis circularis* Haeckel U1381C 7H 6W 106–108 (middle Miocene)

N. *Duppatractus* sp. U1414A 30X 8W 24–36 (late Miocene)

O–P. *Hexacantium armatum/hostile*, **O.** U1414A 30X 5W 22–24 (late Miocene), **P.** U1381C 7H 3W 73–75 (middle Miocene)

Q. *Stylosphaera* sp. U1381C 7H 6W 106–108 (middle Miocene)

R. *Plegmosphaera* sp. U1414A 1H 1W 2–4 (Pleistocene)

Family Phacodiscidae Haeckel, 1881

S. *Heliodiscus* sp. U1381C 7H 1W 66–68 (middle Miocene)

Family Coccodiscidae Haeckel, 1862

T. *Periphaena decora* U1414A 30X 8W 24–26 (late Miocene)

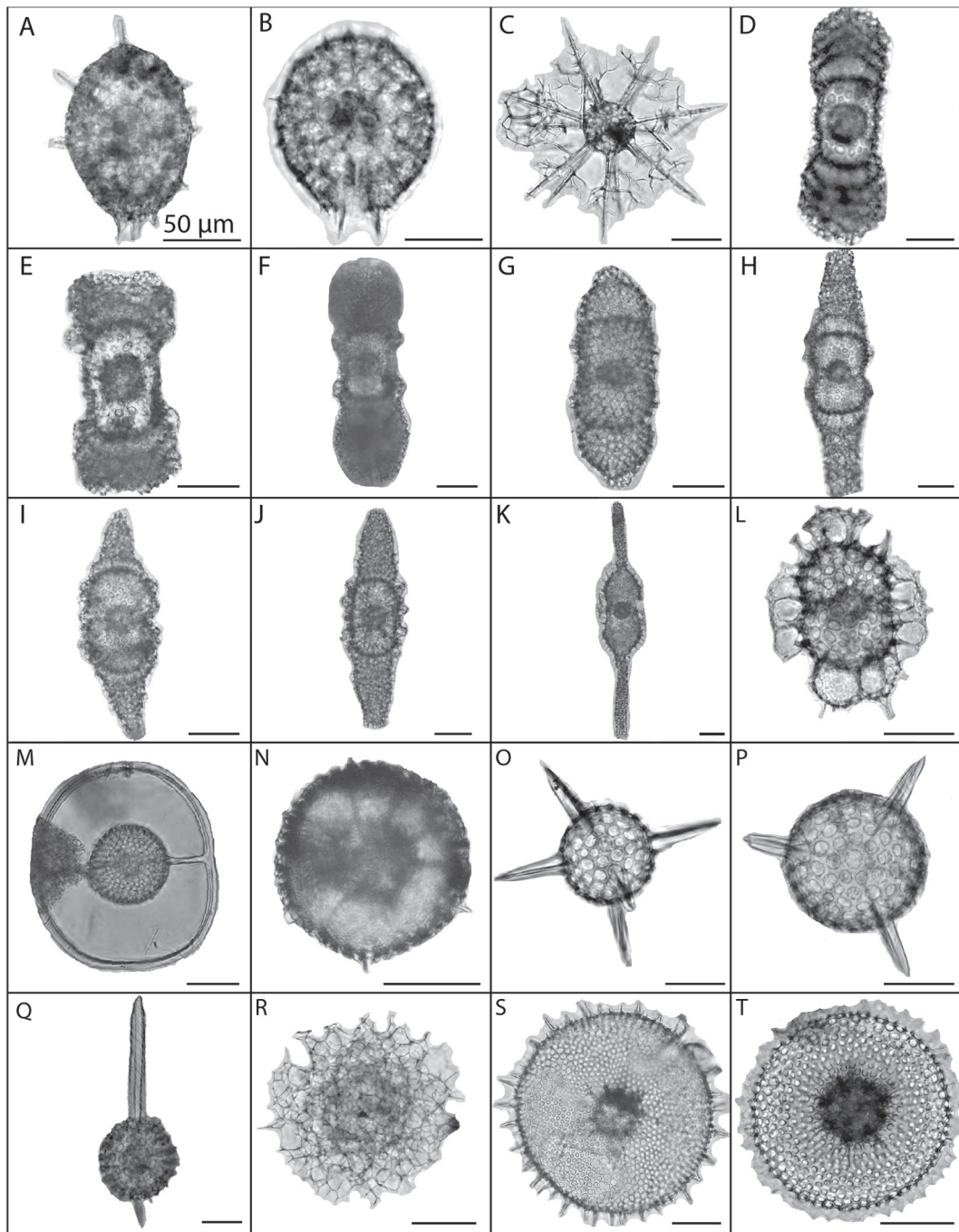


Figure 4

Family Spongodiscidae Haeckel, 1862, emend. Riedel, 1967a in Banner et al., 1967

A. *Amphirhopalum ypsilum* Haeckel U1414A 1H 1W 24–26 (Pleistocene)

B. *Dictyocoryne truncatum* (Ehrenberg) U1414A 1H 2W 2–4 (Pleistocene)

C. *Dictyocoryne profunda* Ehrenberg U1414A 1H 1W 24–26 (Pleistocene)

D–E. *Euchitonia furcata/elegans group* (Ehrenberg), **D.** U1414A 30X 5W 22–24 (Pleistocene), **E.** U1414A 4H 6W 24–26 (Pleistocene)

F. *Spongaster tetras* Ehrenberg U1414A 1H 1W 24–26 (Pleistocene)

G. *Spongaster* sp. A U1414A 7H 1W 137–139 (Pleistocene)

H. *Spongocore puella* Haeckel U1414A 3H 5W 24–26 (Pleistocene)

I. *Stylodictya aculeata* Jørgensen U1414A 26X 7W 16–18 (late Miocene)

J. *Stylodictya validispina* Jørgensen U1414A 30X 5W 22–24 (late Miocene)

K–L. *Spongodiscus* sp. **K.** U1414A 1H 1W 2–4, **L.** U1414A 1H 1W 2–4 (Pleistocene)

M–P. *Circodiscus* spp. **M.** U1414A 1H 1W 2–4 (Pleistocene), **N.** U1381C 7H 6W 45–47 (middle Miocene), **O–P.** U1414A 30X 5W 22–24 (late Miocene)

Q–S. *Spongurus* spp. **Q–R.** U1414A 1H 1W 2–4 (Pleistocene), **S.** U1414A 23X 6W 24–26 (late Miocene)

T. *Spongopyle osculosa* U1414A 1H 1W 24–26 (Pleistocene)

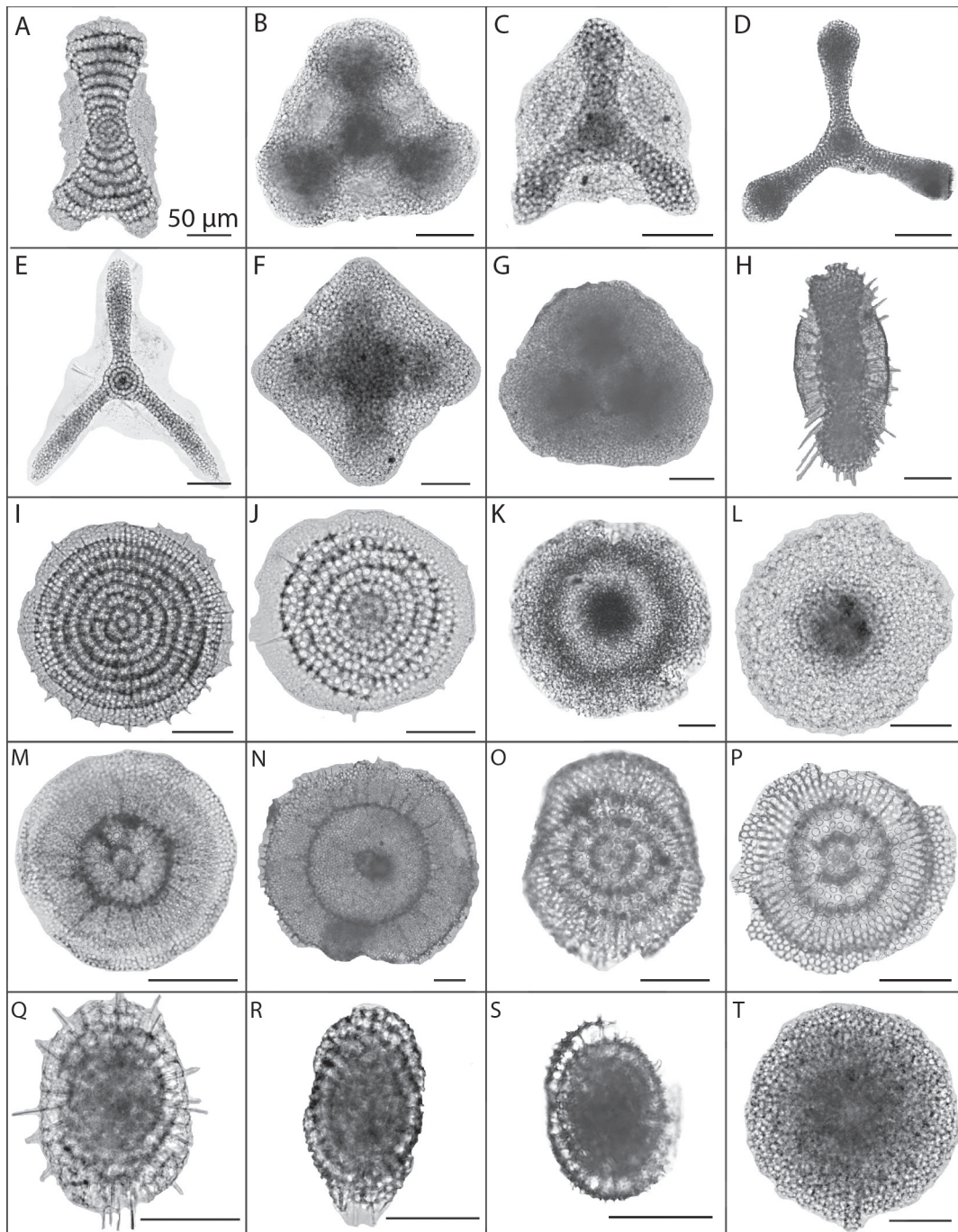


Figure 5

Family Spongodiscidae Haeckel, 1862, emend. Riedel, 1967a in Banner et al., 1967

A–C. *Spongotrochus* spp. **A.** U1414A 30X 4W, 20–22 cm, late Miocene) **B–C.** U1414A 1H 1W, 2–4 cm (Pleistocene)

Family Litheliidae Haeckel, 1882

D. *Larcopyle butschlii* Dreyer U1414A 1 H 1W 2–4 (Pleistocene)

E–F. *Larcopyle nebulum* Lazarus, **E.** U1381C 9H 4W 52–56 (middle Miocene), **F.** U1414 A 29X 3W 24–26 (late Miocene)

G–H. *Lithelius minor* (Jørgensen) U1414A 4H 3W 24–26 (Pleistocene)

I–J. *Larcospira* spp. U1414A 1H 1W 24–26 (Pleistocene)

K–L. *Larcospira quadrangula* Haeckel U1414A 1H 2W 22–24 (Pleistocene)

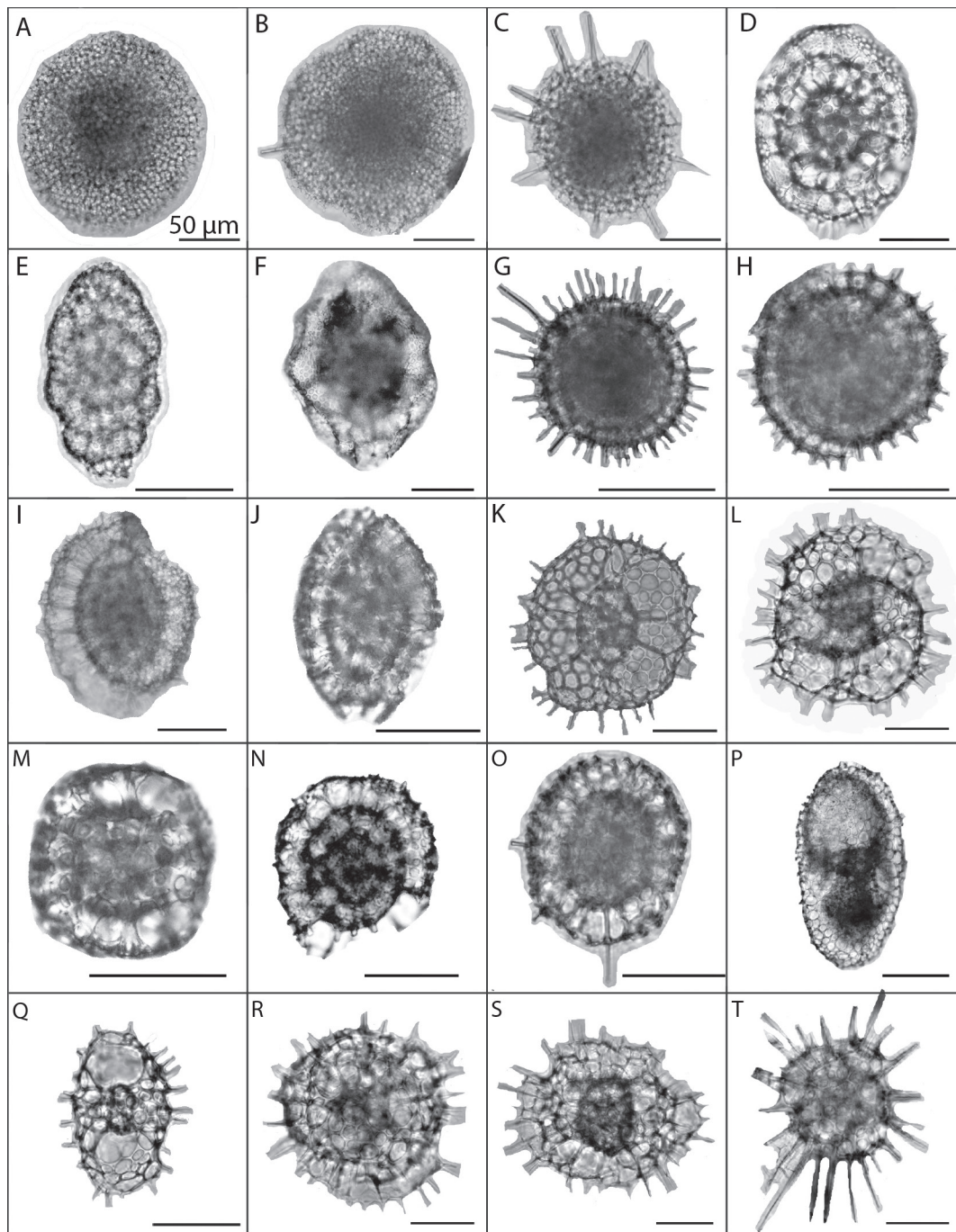
Family Pyloniidae Haeckel, 1881, emend. Dumitrica, 1989

M–O. *Phorticium pylonium* group Haeckel, **M.** U1414A 30X 5W 22–24 (late Miocene), **N.** U1414A 30X 6W 24–26 (late Miocene), **O.** U1414A 1H 1W 2–4 (Pleistocene)

P. *Pylonium* sp. *sensu* Benson U1414A 2H 5W 17–22 (Pleistocene)

Q. *Tetrapyle octacantha* Müller U1414A 6H 5W 26–27 (Pleistocene)

R–T. Spumell. gen and sp. indet. U1414A 1H 1W 24–26 (Pleistocene)



Radiolaria Nasellaria

Figure 6

Family Spyridae Ehrenberg, 1847, emend. Petrushevskaya, 1971

- A.** *Amphispyris reticulata* (Ehrenberg) U1414A 3H 1W 24–26 (Pleistocene)
B. *Cantharospyris platybursa* Haeckel U1414A 1H 2W 24–26 (Pleistocene)
C. *Dendrospyris bursa* Sanfilippo and Riedel U1414A 30X 7W 24–26 (late Miocene)
D. *Giraffospyris toxaria* (Haeckel) U1381C 7H 5W 126–128 (middle Miocene)
E. *Liriospyris parkerae* Riedel and Sanfilippo U1381C 7H 3W 28–30 (middle Miocene)
F–H. *Liriospyris* spp. **F.** U1414A 30X 5W 22–24 (late Miocene), **G.** U1381C 11H 1W 40–44 (middle Miocene), **H.** U1414A 31X 1W 24–26 (late Miocene)
I. *Lophospyris pentagona pentagona* (Ehrenberg) U1414A 1H 2W 24–26 (Pleistocene)
J. *Neophrosopyris renilla* Haeckel U1414A 6H 1W 26–27 (Pleistocene)
K. *Androsopyris huxleyi* Haeckel U1414A 1H 1W 2–4 (Pleistocene)
L. *Zigocircus productus* Haeckel U1414 1H 1W 2–4 (Pleistocene)
M. *Phormospyris* sp. A U1414A 27X 4W 24–26 (late Miocene)
N. *Phormospyris stabilis stabilis* Goll U1414 1H 1W 24–26 (Pleistocene)
O. *Phormospyris stabilis capoi* Goll U1414A 5H 5W 24–26 (Pleistocene)
P. *Phormospyris stabilis scaphipes* (Haeckel) U1414A 4H 6W 24–26
Q–T. *Tholospyris* sp., **Q.** U1414A 30X 5W 24–26 (middle Miocene), **R.** U1381C 7H 3W 109–111 (middle Miocene), **S–T.** U1381C 7H 6W 106–108 (middle Miocene)

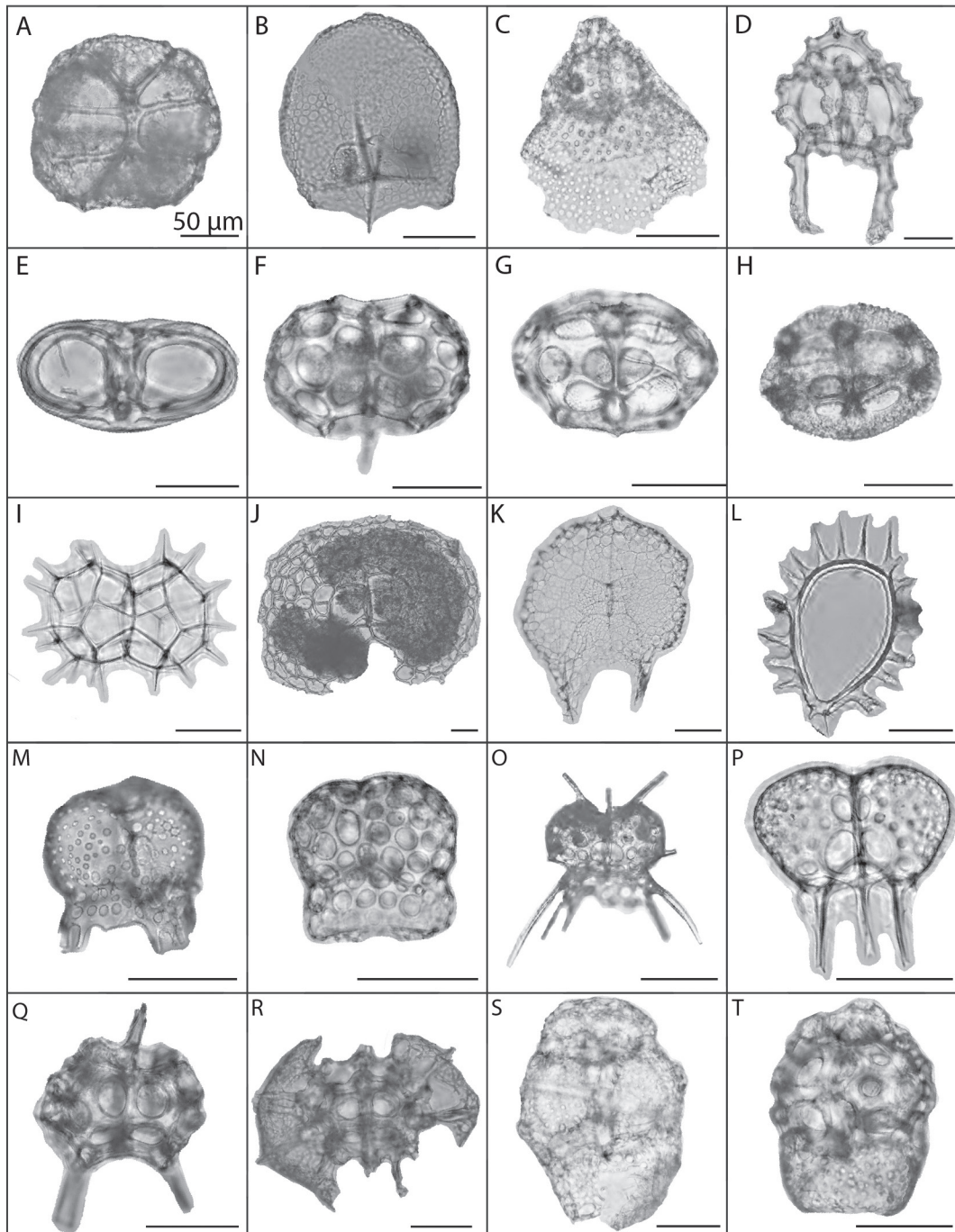


Figure 7

Family Plagoniidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

A. *Amphiplecta acrostoma* Haeckel U1414A 1H 1W 24–26 (Pleistocene)

B–D. *Cladoscenium* spp. **B.** U1414A 1H 1W 2–4 (Pleistocene), **C.** U1414A 1H 1W 24–26 (Pleistocene), **D.** U1414 3H 1W 24–26 (Pleistocene)

E. *Clathrocanium* sp. U1381C 8H 3W 50–52 (middle Miocene)

F. *Lophophaena hispida* (Ehrenberg) U1414A 1H 2W 24–26 (Pleistocene)

G. *Lophophaena* aff. *hispida* U1414A 4H 6W 24–26 (Pleistocene)

H. *Lophophaena* aff. *capito* U1381C 7H1W 2–4 (middle Miocene)

I–L. Plagoniidae group, **I.** U1414A 1H 1W 2–4 (Pleistocene), **J.** U1414A 2H 3W 23–25 (Pleistocene),

K. U1381C 7H 6W 1–3, **L.** U1381C 7H 6W 23–25 (middle Miocene)

M. *Pteroscenium* sp. U1414A 1H 2W 24–26 (Pleistocene)

N. *Pteroscenium pinnatum* Haeckel U1414 29X 3W 24–26 (late Miocene)

O. *Tetraphormis dodecaster* (Haeckel) U1414A 1W 1H 2–4 (Pleistocene)

P. *Clathrocorys* aff. *teuscheri* U1414A 1H 1W 24–26 (Pleistocene)

Q–R. *Helothus histicosa* Jørgensen, **Q.** U1381C 7H 6W 23–25 (middle Miocene), **R.** U1414A 30X 5W 24–26 (late Miocene)

S. *Helothus* aff. *histicosa* U1381C 7H 6W 23–25 (middle Miocene)

T. *Sethophormis* sp. A U1381C 8H 3W 50–52 (middle Miocene)

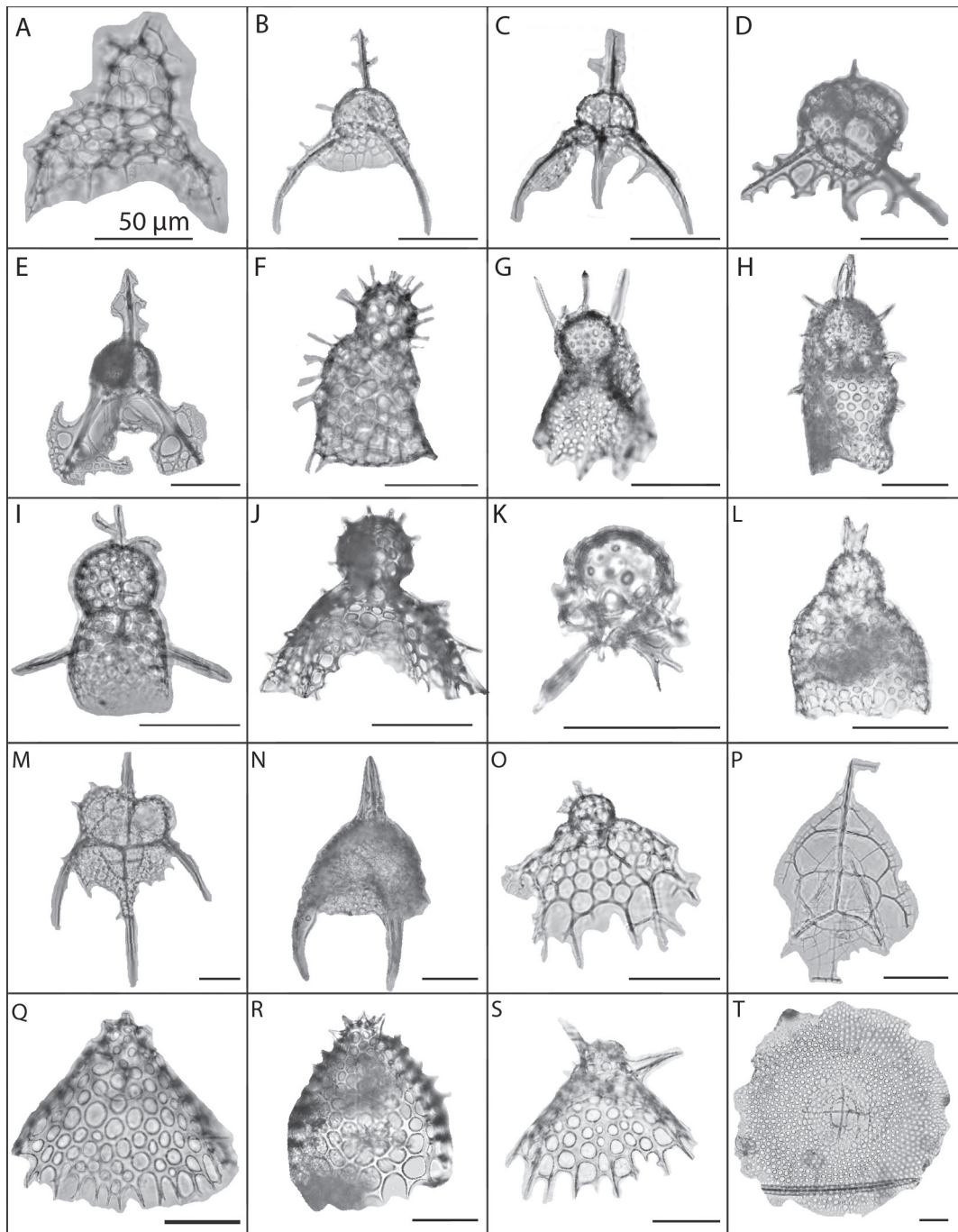


Figure 8

Family Theoperidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

A. *Artopilium undulatum* Popofsky U1414A 8H 1W 24–26 (Pleistocene)

B. *Clathrocyclas alcmenae* Haeckel U1414A 7H 2W 24–26 (Pleistocene)

C. *Clathrocyclas monumentum* Haeckel U1414A 1H 1W 24–26 (Pleistocene)

D–F. *Corocalyptra kruegeri* (Popofsky), **D.** U1381C 7H 6W 106–108 (middle Miocene), **E.** U1414A 30H 5W 22–24 (late Miocene), **F.** U1381C 7H 3W 4–6 (middle Miocene).

G. *Corocalyptra* sp. U1414A 2H 5W 17–22 (Pleistocene)

H. *Corocalyptra cervus* Ehrenberg U1414A 1H 1W 2–4 (Pleistocene)

I. *Cornutella profunda* Ehrenberg U1414 2W 5W 17–22 (Pleistocene)

J–K. *Cycladophora davisiana* (Ehrenberg), **J.** U1381C 2H 4W 66–68, **K.** U14141 A 1H 1W 24–26 (Pleistocene)

L–M. *Cyrtocapsella cornuta* Haeckel U1414A 27X 4W 24–26 (late Miocene)

N–O. *Cyrtocapsella tetrapera* (Haeckel) **N.** U1414A 30X 8W 24–26 (late Miocene), **O.** U1381C 11H 1W 40–44 (middle Miocene)

P. *Cyrtocapsella cylindroides* (Principi) U1381C 7H 1W 137–139 (middle Miocene)

Q–S. *Cyrtocapsella japonica* (Nakaseko), **Q–R.** U1414A 30X 7W 24–26 (late Miocene), **S.** U1414A 30X 8W 24–26 (middle Miocene)

T. *Cyrtocapsella* sp. U1381C 7H 1W 137–139 (middle Miocene)

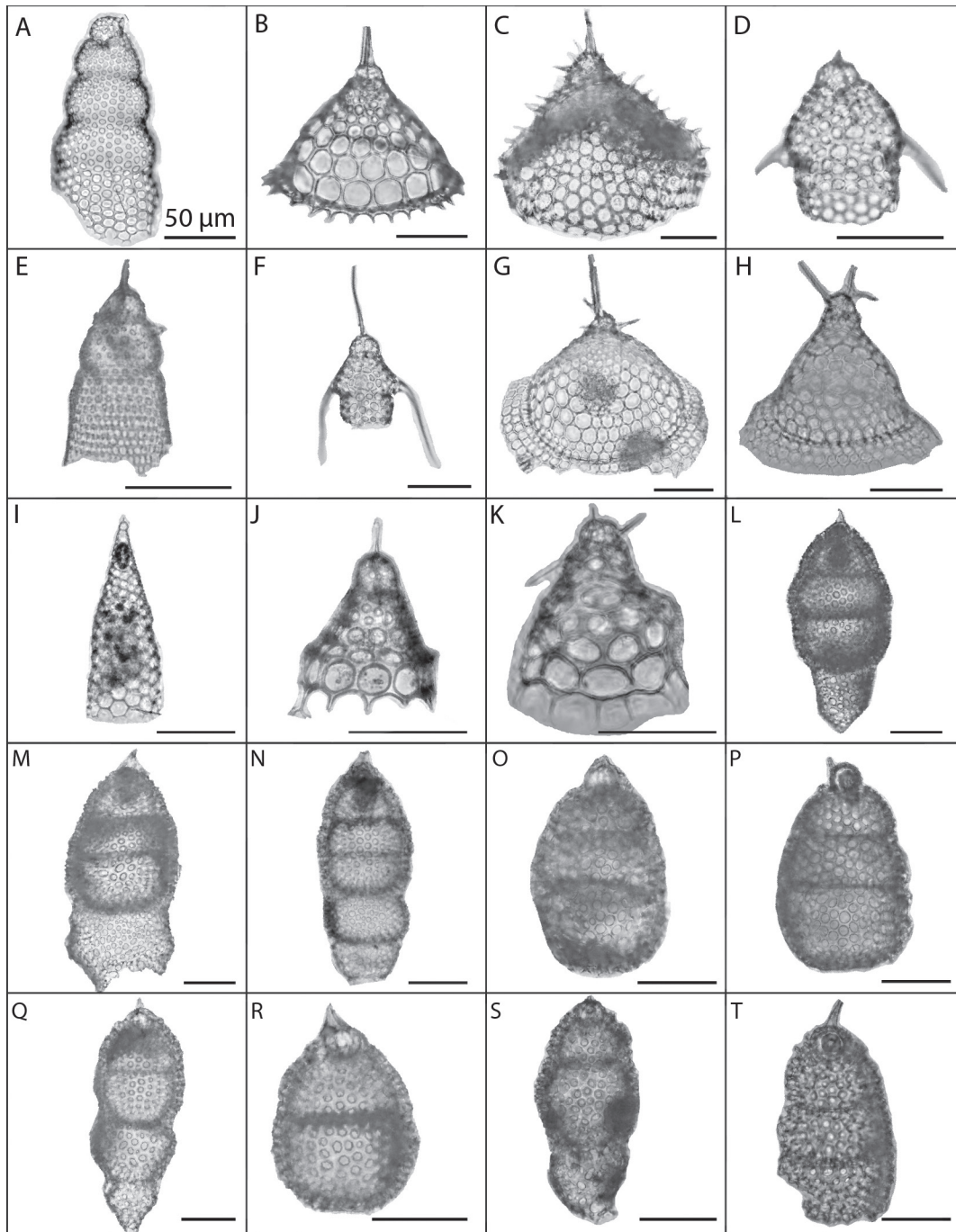


Figure 9

Family Theoperidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

A–B. *Dictyophimus infabricatus* Nigrini, **A.** U1414A 1H 1W 2–4 (Pleistocene), **B.** U1414A 1H 1W 24–26 (Pleistocene)

C. *Dictyophimus hirundo* Haeckel U1414A 1H 2W 24–26 (Pleistocene)

D–F. *Dictyophimus* spp. **D.** U1414A 1H 1W 24–26 (Pleistocene), **E.** U1414A 3H 1W 24–26 (Pleistocene), **F.** U1414A 30X 5W 22–24 (late Miocene)

G. *Eucecryphalus gegenbauri* Haeckel U1414A 1H 1W 2–4 (Pleistocene)

H–K. *Eucecryphalus tricostatum* Haeckel, **H.** U1414A 1H 2W 24–26 (Pleistocene), **I.** U1381C 7H 3W 28–30 (middle Miocene), **J–K.** U1414A 7H 2W 24–26 (late Miocene)

L–S. *Eucecryphalus* spp. **L.** U1381C 7H 1W 66–68 (middle Miocene), **M.** U1414A 30X 5W 22–24 (middle Miocene), **N.** U1381C 2H 4W 66–68 (Pleistocene), **O.** U1381C 7H 1W 37–39 (middle Miocene), **P.** U1414A 1H 1W 24–26 (Pleistocene), **Q.** U1381C 7H 3W 118–120, **R–S.** U1381C 5H 3W 89–91 (late Miocene), **T.** U1414A 29X 3W 24–26 (late Miocene)

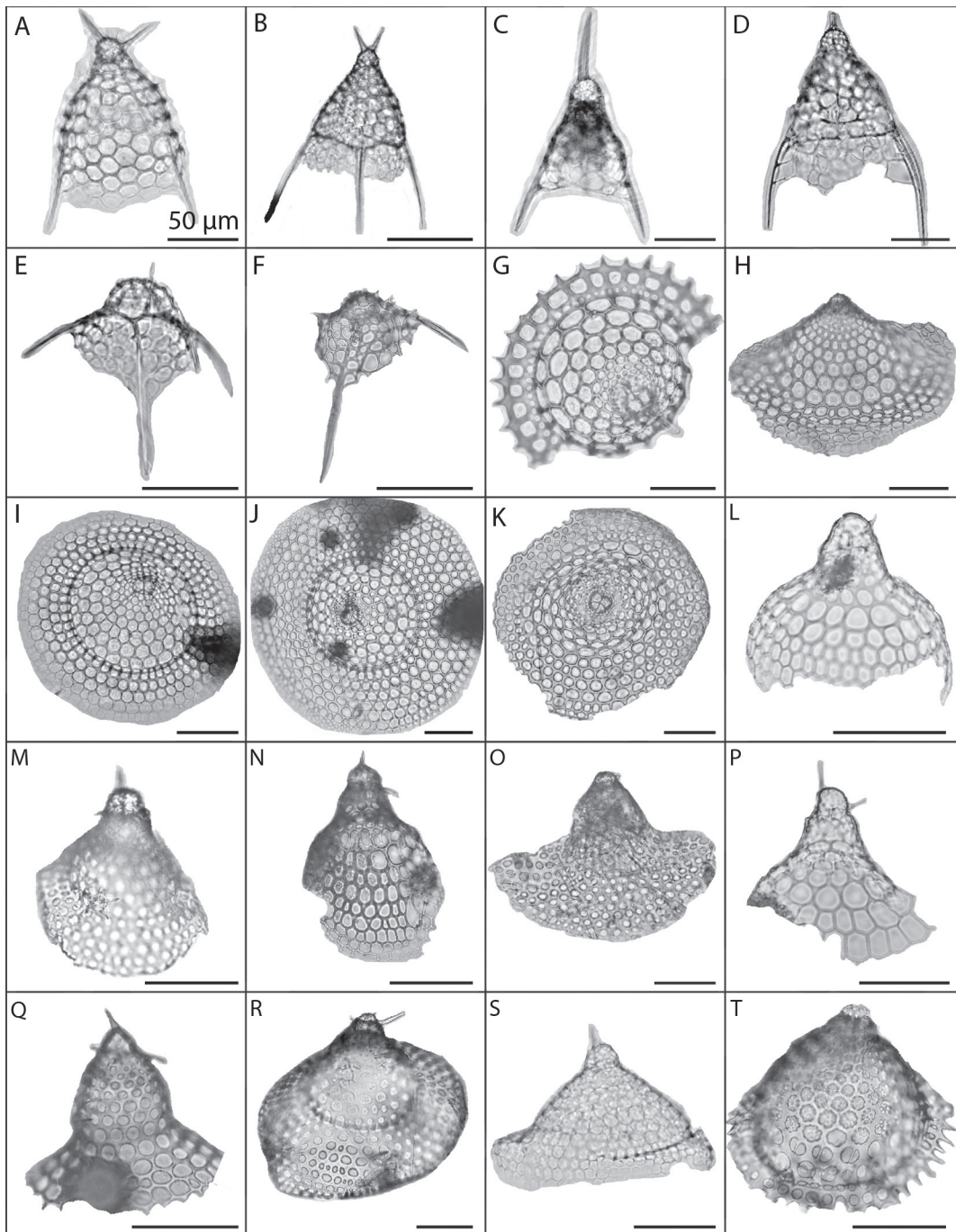


Figure 10

Family Theoperidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

A. *Eucyrtidium anomalum* (Haeckel) U1414A 24X 1W 24–26 (late Miocene)

B. *Eucyrtidium calvertense* Martin U1414A 22H 4W 24–26 (late Miocene)

C–D. *Eucyrtidium cienkowskii* Haeckel, **C.** U1414A 30X 5W 22–24 (late Miocene), **D.** U1381C 7H 1W 37–39 (middle Miocene)

E–G. *Eucyrtidium hexagonatum* Ehrenberg, **E.** U1414A 2H 5W 17–22 (Pleistocene), **F.** U1414A 1H 1W 2–4 (Pleistocene), **G.** U1414A 3H 1W 24–26 (Pleistocene)

H. *Eucyrtidium hexastichus* Haeckel U1381C 5H 1W 27–31 (late Miocene)

I. *Eucyrtidium teuscheri* Haeckel U1414A 3H 1W 24–26 (Pleistocene)

J–L. *Eucyrtidium* spp. **J–K.** U1414A 1H 1W 2–4, **L.** U1414A 2H 1W 17–22 (Pleistocene), **M–N.** U1414A 1H 1W 2–4 (Pleistocene), **O.** U1381C 5H 1W 27–31 (Pleistocene), **P.** U1414 28X 2W 24–26 (late Miocene), **Q–R.** U1381C 7H 6W 106–108 (middle Miocene), **S.** U1381C 7H 6W 3W 73–75 (middle Miocene), **T.** U1381C 7H 6W 60–62 (middle Miocene).

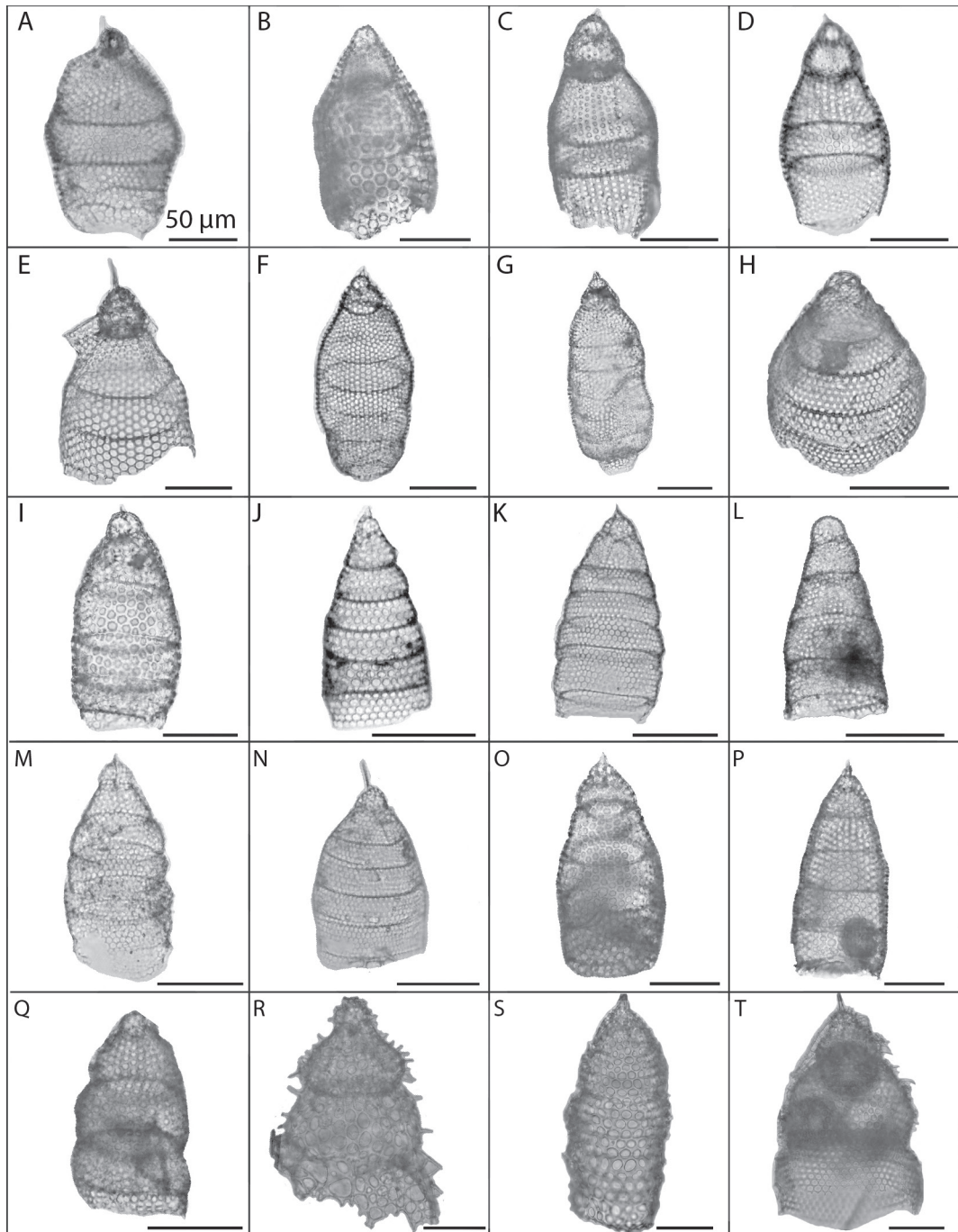


Figure 11

Family Theoperidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

A. *Lampromitra schultzei* Haeckel U1414A 1H 2W 24–26 (Pleistocene)

B. *Litharachnium tentorium* Haeckel U1414A 3H 5W 24–26 (Pleistocene)

C–D. *Lipmanella dictyoceras* (Haeckel), **C.** U1414A 4H 3W 24–26 (Pleistocene), **D.** U1381C 7H 2W 1–3 (middle Miocene)

E. *Lipmanella* sp. U1381C 10H 4W 36–40 (middle Miocene)

F–H. *Lithopera neotera* Sanfilippo and Riedel, **F.** U1414A 31X 1W 24–26 (late Miocene), **G.** U1414A 28X 7W 24–26 (late Miocene), **H.** U1414A 30X 7W 24–26 (late Miocene)

I–L. *Lithopera renzae* Riedel and Sanfilippo, **I.** U1381C 7H 3W 73–75 (middle Miocene), **J.** U1381C 7H 3W 73–75 (middle Miocene), **K.** U1414A 30X 8W 22–24 (late Miocene), **L.** U1381C 7H 6W 24–26 (middle Miocene)

M. *Lithopera thornburgi* Sanfilippo and Riedel U1414A 28X 7W 24–26 (late Miocene)

N. *Lithostrobus hexagonalis* Haeckel U1414A 4H 6W 24–26 (Pleistocene)

O. *Lophocyrtis brachythorax* (Sanfilippo and Riedel) U1414A 29X 3W 24–26 (late Miocene)

P. *Lophocyrtis tanythorax* Sanfilippo and Riedel U1381C 7H 1W 66–68 (middle Miocene)

Q–R. *Lophocyrtis* spp. **Q.** U1381C 7H 1W 119–121 (middle Miocene), **R.** U1381C 7H 1W 37–39 (middle Miocene)

S–T. Nassell. gen. and sp. indet., **S.** U1381C 9H 4W 52–56 (middle Miocene), **T.** U1381C 7H 3W 73–75 (middle Miocene)

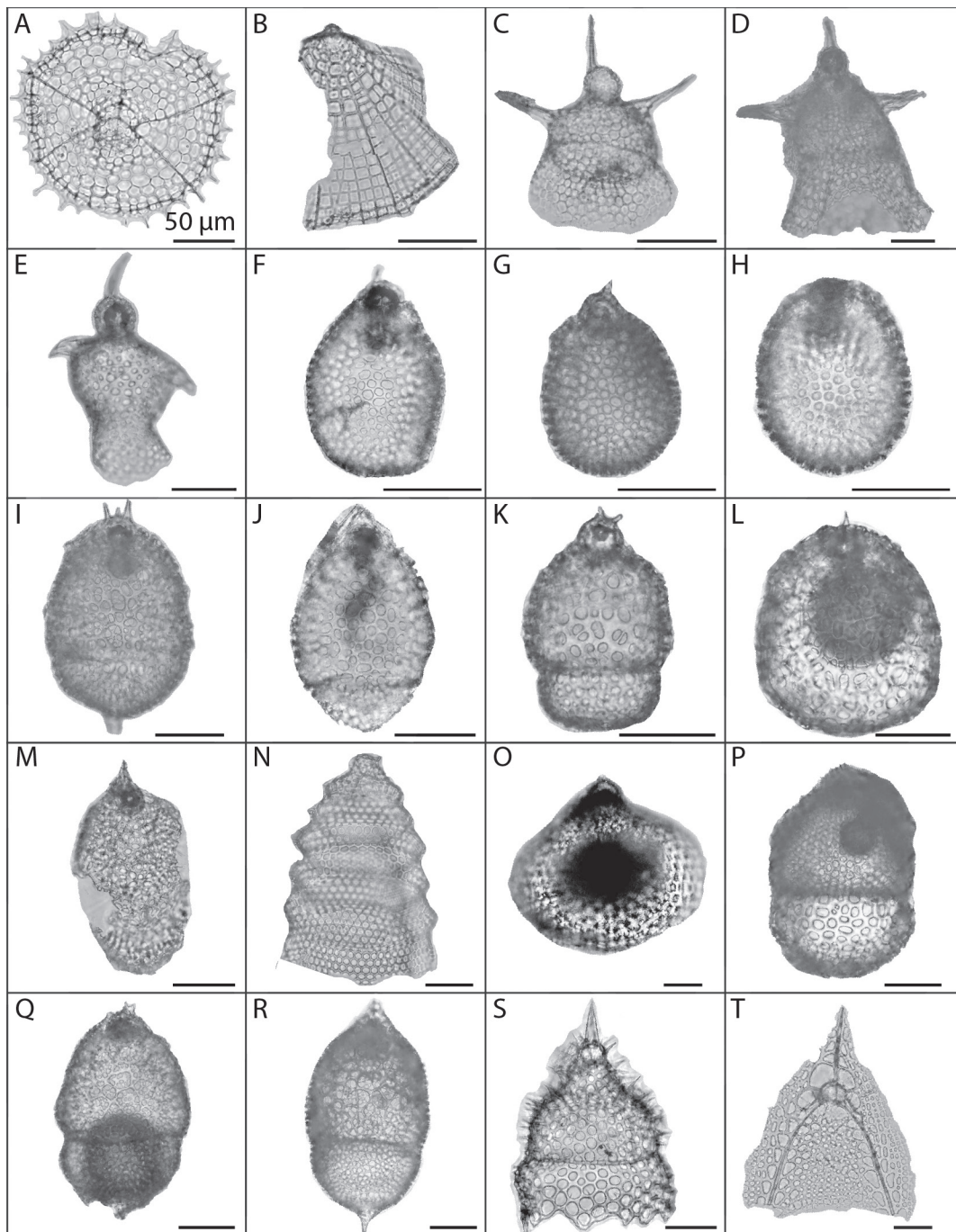


Figure 12

Family Theoperidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

A–B. *Pterocanium grandiporus* (Haeckel), **A.** U1414A 2H 5W 17–22 (Pleistocene), **B.** U1414A 3H 5W 24–26 (Pleistocene)

C–D. *Pterocanium praetextum* (Ehrenberg), **C.** U1414A 1H 1W 2–4 (Pleistocene), **D.** U1414A 1H 1W 24–26 (Pleistocene)

E–H. *Pterocanium trilobum* (Haeckel), **E.** U1414A 4H 6W 24–26 (Pleistocene), **F.** U1414A 10H 2W 24–26 (Pleistocene), **G.** U1414A 26X 7W 16–18 (late Miocene), **H.** U1414A 2H 5W 17–22 (Pleistocene)

I–J. *Stichocorys armata* (Haeckel), **I.** U1381C 7H 1W 119–121 (middle Miocene), **J.** U1381C 7H 1W 119–121 (middle Miocene)

K–L. *Stichocorys delmontensis* (Campbell and Clark), **K.** U1381C 7H 1W 137–139 (middle Miocene), **L.** U1381C 7H 3W 28–30 (middle Miocene)

M. *Stichocorys peregrina* (Riedel) U1414A 31X 1W 24–26 (late Miocene)

N. *Stichocorys* sp. U1414A 30X 5W 22–24 (late Miocene)

O–P. *Stichopilium bicornis* Haeckel, **O.** U1414A 3H 1W 24–26 (Pleistocene), **P.** U1414A 3H 1W 24–26 (Pleistocene)

Q–S. *Theocorys* (?) spp. **Q.** U1381C 7H 6W 1–3 (middle Miocene), **R.** U1381C 7H 2W 1–3 (middle Miocene), **S.** U1381C 7H 1W 37–39 (middle Miocene).

T. *Theocorys veneris* (Haeckel) U1414A 1H 2W 24–26 (Pleistocene)

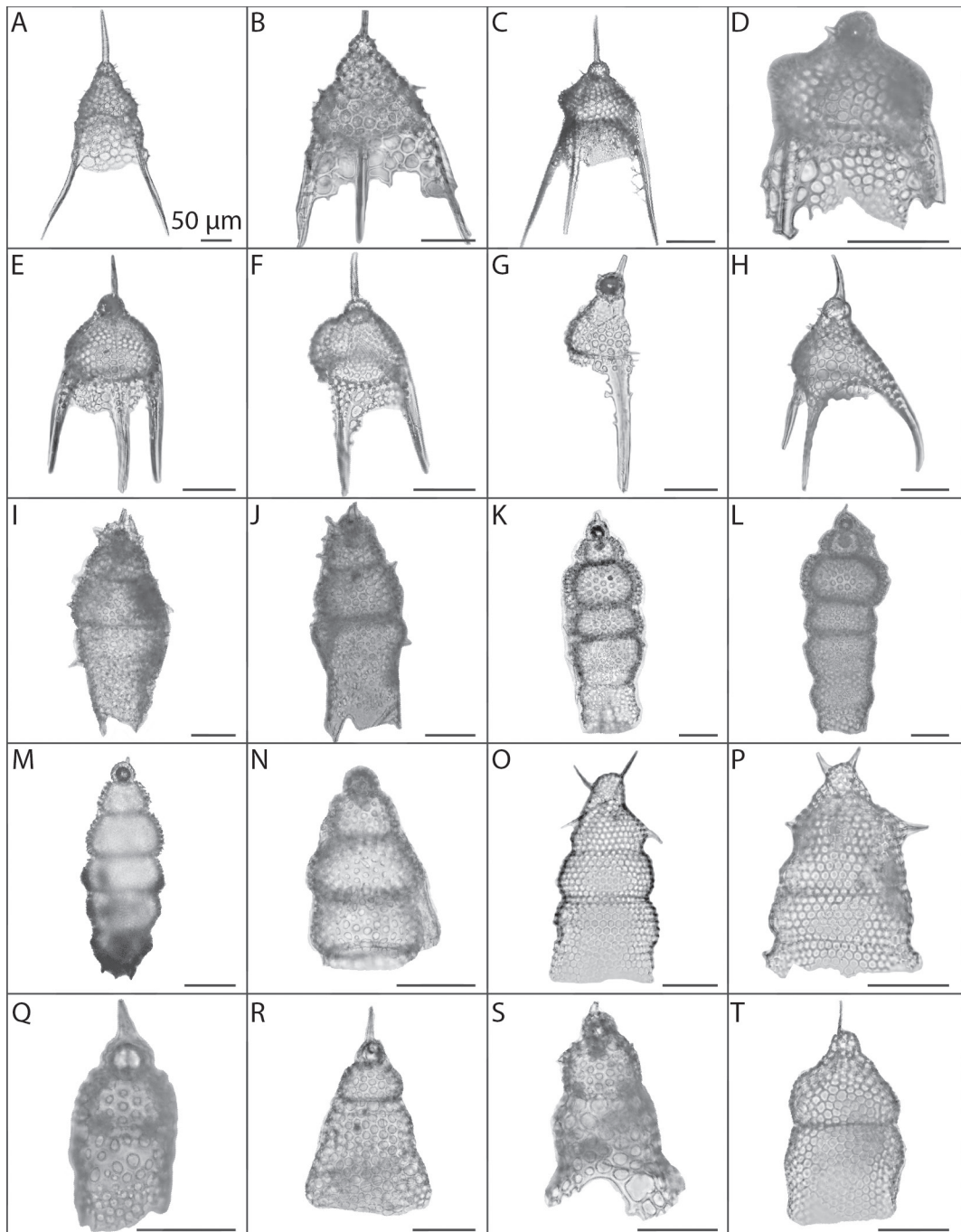


Figure 13

Family Theoperidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

A–B. *Carpocanarium papillosum* Ehrenberg, **A.** U1414A 27X 4W 24–26 (late Miocene), **B.** U1414A 28X 7W 24–26 (late Miocene)

C–D. *Carpocanarium* aff. *papillosum*, **C.** U1414A 29X 3W 24–26 (late Miocene), **D.** U1414A 30X 8W 24–26 (late Miocene)

Family Carpacaniidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967

E–F. *Carpocanistrum acutidentatum* Takahashi, **E.** U1414A 2H 5W 17–22 (Pleistocene), **F.** U1414A 4H 6W 24–26 (Pleistocene)

G–I. *Carpocanistrum* spp. **G.** U1414A 3H 1W 24–26 (Pleistocene), **H.** U1414A 4H 6W 24–26 (Pleistocene), **I.** U1414A 10H 2W 24–26 (Pleistocene)

J–K. *Carpocanopsis cristata* (Carnevale), **J.** U1414A 31X 1W 24–26 (late Miocene), **K.** U1381C 7H 4W 52–56 (middle Miocene)

Family Cannobotryidae Haeckel, 1881

L–N. *Botryocyrtis scutum* (Harting), **L.** U1414A 2H 5W 17–22 (Pleistocene), **13M.** U1414A 3H 5W 24–26 (Pleistocene), **N.** U1414A 30X 8W 24–26 (late Miocene)

O. *Botryocyrtis* sp. U1381C 5H 1W 27–31 (middle Miocene)

P–Q. *Botryopyle dictyocephalus* Haeckel U1381C 7H 2W 1–3 (middle Miocene)

R–S. *Botryopyle* sp. **R.** U1381C 7H 1W 119–121 (middle Miocene), **S.** U1381C 7H 3W 4–6 (middle Miocene)

T. *Centrobotrys thermophila* (Petrushevskaya) U1381C 7H 1W 37–39 (middle Miocene)

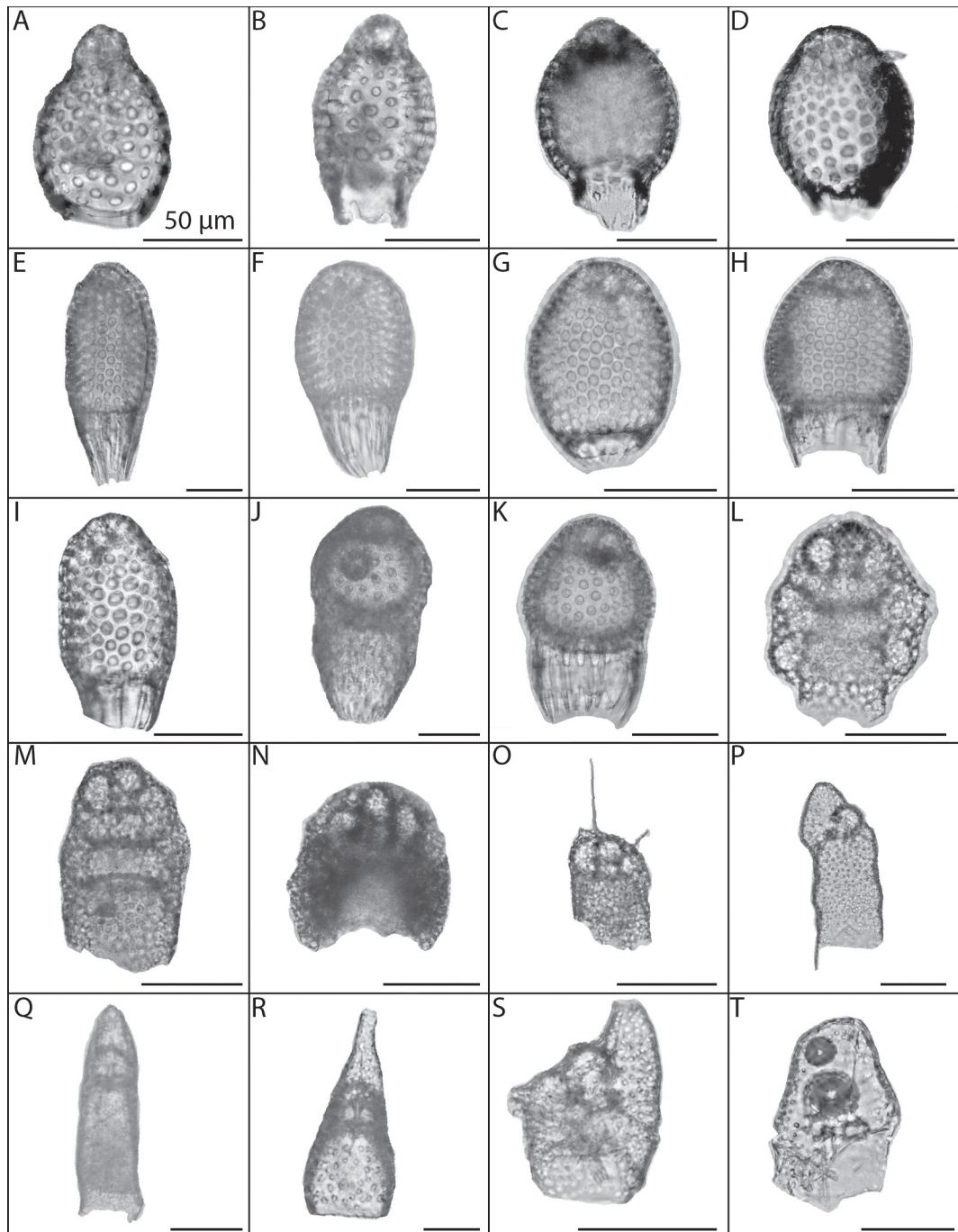


Figure 14

Family Artostrobiidae Riedel, 1967a in Banner et al., 1967 and Riedel, 1967b

A. *Artostrobos annulatus* (Bailey) U1414A 30X 5W 22–24 (late Miocene)

B–C. *Botryostrobus aquilonaris* (Bailey), **B.** U1414A 1H 1W 24–26 (Pleistocene), **C.** U1414A 3H 5W 24–26 (Pleistocene)

D–E. *Botryostrobus auritus* (Ehrenberg), **D.** U1414A 1H 2W 24–26 (Pleistocene), **E.** U1414A 4H 6W 24–26 (Pleistocene)

F. *Botryostrobus bramlettei* (Campbell and Clark) U1414A 30X 5W 22–24 (late Miocene)

G–H. *Phormostichoartus corbula* (Harting) U1414A 8H 1W 24–26 (Pleistocene)

I. *Phormostichoartus doliolum* (Riedel) U1414A 26 X 7W 16–18 (late Miocene)

J. *Phormostichoartus marylandicus* (Martin) U1381C 7H 6W 60–62 (middle Miocene)

K–L. *Siphocampe* sp.A, **K.** U1414A 26X 7W 16–18 (late Miocene), **L.** U1381C 6H 7W 21–23 (middle Miocene).

M. *Siphocampe arachnea* (Ehrenberg) U1414A 30X 5W 22–24 (late Miocene)

N. *Siphocampe lineata* (Ehrenberg) U1381C 7H 6W 23–25 (middle Miocene)

O–P. *Siphostichoartus corona* (Haeckel), **O.** U1414A 26X 7W 16–18 (late Miocene), **P.** U1414A 30X 5W 22–24 (late Miocene)

Q. *Spirocyrtis gyrosularis* Nigrini U1414A 28X 7W 24–26 (late Miocene)

R–S. *Spirocyrtis scalaris* Haeckel, **R.** U1414A 1H 2W 24–26 (Pleistocene), **S.** U1414A 1H 1W 2–4 (Pleistocene)

T. *Spirocyrtis subtilis* Petrushevskaya U1381C 7H 6W 23–25 (middle Miocene)

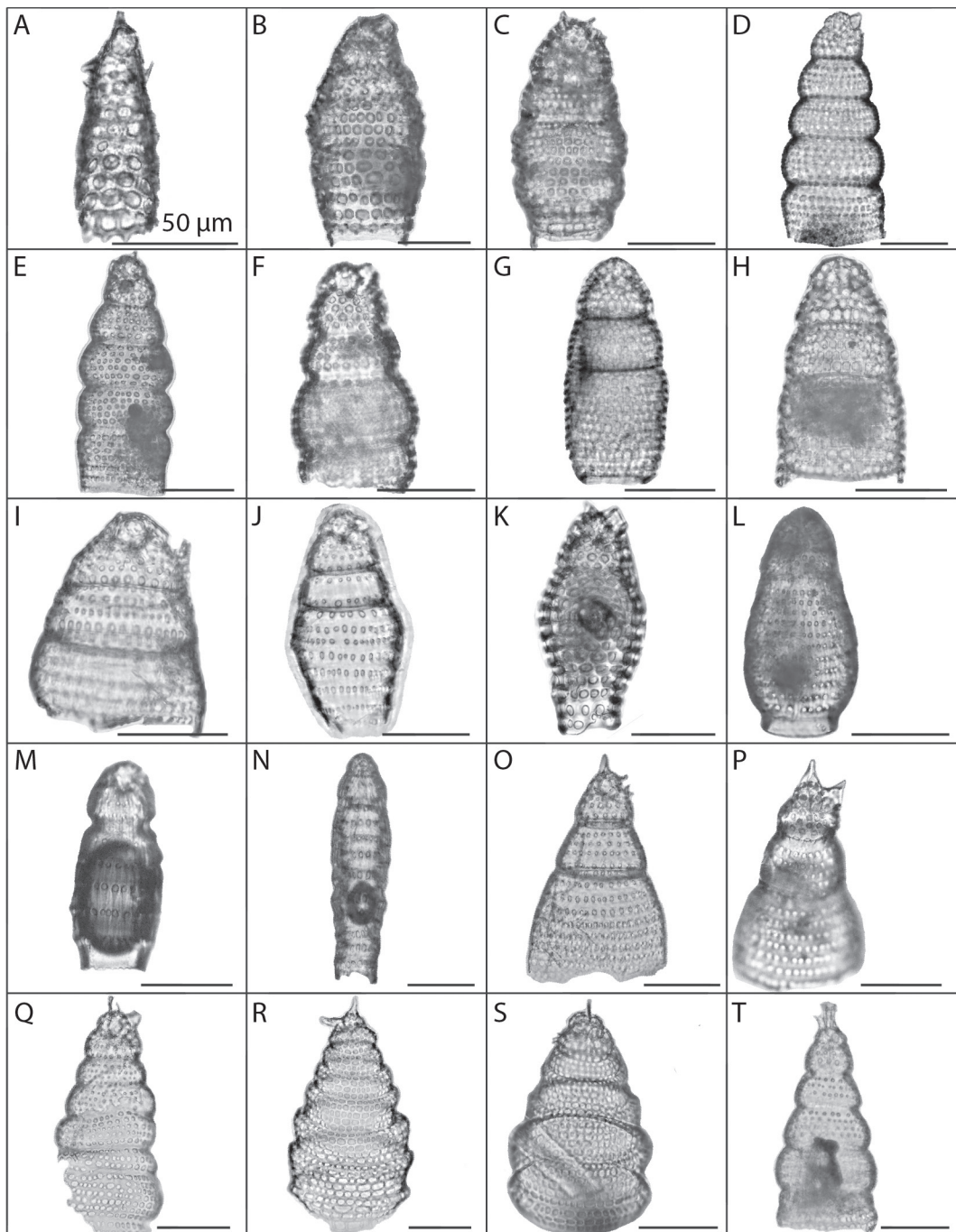


Figure 15

Family Pterocorythidae Haeckel, 1881, emend. Riedel, 1967a in Banner et al., 1967, emend. Moore, 1972

A–B. *Anthocyrtidium ehrenbergi* (Stöhr), **A.** U1381C 7H 5W 126–128 (middle Miocene), **B.** U1381C 7H 1W 37–39 (middle Miocene)

C–D. *Anthocyrtidium ophirensense* (Ehrenberg), **C.** U1414A 3H 5W 24–26 (Pleistocene), **D.** U1414A 4H 6W 24–26 (Pleistocene)

E–F. *Anthocyrtidium* spp. **E.** U1414A 4H 6W 24–26 (Pleistocene), **F.** U1381C 7H 1W 137–139 (middle Miocene)

G–H. *Calocycletta caepa* Moore, **G.** U1381C 7H 6W 60–62, **H.** U1381C 7H 6W 106–108 (middle Miocene)

I. *Calocycletta virginis* Haeckel U1381C 7H 2W 133–135 (middle Miocene)

J. *Lamprocyclas junonis* (Haeckel) U1414A 7H 2W 24–26 (late Miocene)

K–L. *Lamprocyclas maritalis* Haeckel, **K.** U1414A 11H 3W 33–35 (Pleistocene), **L.** U1381C 7H 1W 137–139 (middle Miocene)

M. *Lamprocyclas* sp. A U1414A 28X 2W 24–26 (late Miocene)

N. *Lamprocyrtilis nigrinae* Caulet U1414A 3H 5W 24–26 (Pleistocene)

O–P. *Lamprocyrtilis* sp., **O.** U1414A 1H 1W 2–4, **P.** U1414A 4H 6W 24–26 (Pleistocene)

Q. *Pterocorys minythorax* (Nigrini) U1414A 1H 1W 24–26 (Pleistocene)

R–S. *Pterocorys zancleus* (Müller), **R.** U1414A 1H 1W 2–4 (Pleistocene), **S.** U1414A 1H 2W 24–26 (Pleistocene)

T. *Pterocorys* sp. U1414A 28X 2W 24–26 (late Miocene)

