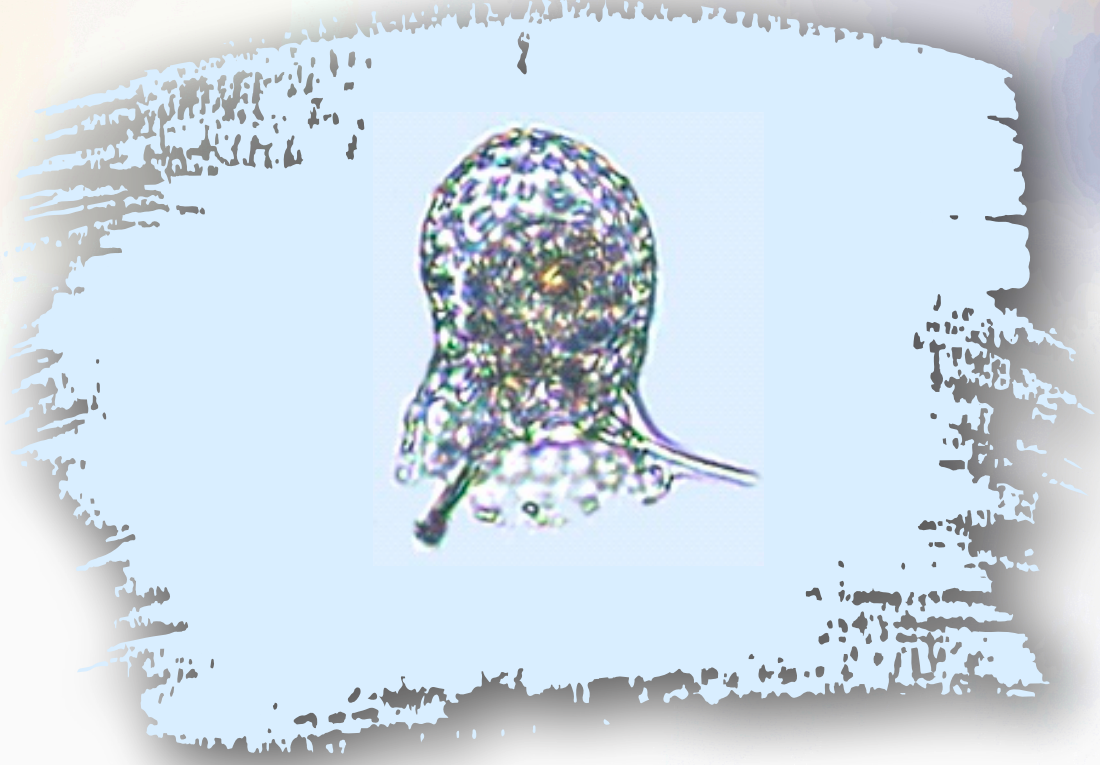


FAUNA OF INDIA CHECKLIST

JULY, 2024

ONLINE VERSION 1.0



RADIOZOA Cavalier-Smith, 1987

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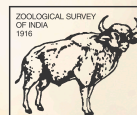
Key words: Radiolaria, India, checklist, marine biodiversity

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Comments on the checklist:

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ZOOLOGICAL SURVEY OF INDIA
Ministry of Environment, Forest & Climate Change

RADIOZOA Cavalier-Smith, 1987

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Introduction: While the scientific definition has undergone changes over time, and in particular during the last two decades, phylum Radiozoa Cavalier-Smith, 1987 (Radiolaria Muller, 1858) can be described as a group of diverse protists characterised by their delicate and elaborate mineral skeletons with sizes ranging from 40 µm to 400 µm. They are marine holoplanktonic forms, present in all major oceans but absent from some marginal seas. While most radiozoans are solitary, some colonial forms exist (Suzuki and Aita, 2011; Stern et al., 2017; Biard, 2022). They possess axopodia, which are retractable cytoplasmic processes that radiate out from the cell and are used to capture prey. Their characteristic hard skeleton varies in composition among different radiozoan subgroups- Polycystine and taxopodid radiozoans (class Polycystina Ehrenberg, 1838 and class Sticholonchea) have a mineral skeleton consisting of opaline silica; on the other hand, Acantharian radiozoans (class Acantharia Haeckel, 1881) have a skeleton made of spicules that cross the cell body and are made up of strontium sulphate. This is the only known example of a protist that biomineralizes this particular element, but it quickly dissolves when the organism dies and is exposed to fixatives (Decelle and Not, 2015). One of the most notable attributes of radiozoans is their intricate relationships with photosymbionts. Many species of radiozoans can harbour ten to hundreds of symbionts within their cell bodies, wherein the radiozoan host obtains carbon-rich products from the photosynthetic activity of the symbionts, and the symbiont benefits from a protected micro-environment (Biard, 2022). While radiozoans (except Acantharia) have been extensively studied as fossils by paleontologists, biologists have tended to overlook them until recent times.

Global diversity: Radiozoa can be found in a variety of marine environments worldwide. These environments include tropical, subtropical, and polar waters (Suzuki and Aita, 2011). In the marine waters of the world, 467 extant species of radiozoa are found, belonging to three classes, nine orders and 37 families (Guiry, M.D. & Guiry, G.M., 2023).

Diversity in India : In the Indian marine waters, 115 species belonging to two classes, five orders and 20 families have been reported so far.

Diversity in States

Sl. No.	State/UT	No. Species
1	Andhra Pradesh	0
2	Arunachal Pradesh	0
3	Assam	0
4	Bihar	0
5	Chhattisgarh	0
6	Gujarat	0
7	Goa	0

Sl. No.	State/UT	No. Species
8	Haryana	0
9	Himachal Pradesh	0
10	Jharkhand	0
11	Karnataka	0
12	Kerala	0
13	Madhya Pradesh	0
14	Maharashtra	0
15	Manipur	0
16	Meghalaya	0
17	Mizoram	0
18	Nagaland	0
19	Odisha	1
20	Punjab	0
21	Rajasthan	0
22	Sikkim	0
23	Tamil Nadu	1
24	Telangana	0
25	Tripura	0
26	Uttarpradesh	0
27	Uttarakhand	0
28	West Bengal	0
29	Andaman & Nicobar	50
30	Chandigarh	0
31	Dadra Nagar Haveli, Daman & Diu	0
32	Delhi	0
33	Jammu & Kashmir	0
34	Ladakh	0
35	Lakshadweep	0
36	Puducherry	0
37	State Unknown	89
	INDIA TOTAL	115

Endemism: Although some endemism is observed in certain Arctic polycystine radiolarians, none have been recorded that are endemic to Indian waters.

Habitat: Radiozoa predominantly dwell in marine environments, specifically in tropical, subtropical, and arctic waters around the world, occupying different depths in the water column.

Ecological Significance: Radiozoa are primarily recognized by their fossil records, and their modern-day ecological behaviour is not extensively understood. They have a broad distribution and can be found in various depths of the ocean. Little is known about their genetic diversity and biogeographic patterns in modern-day oceans. They play a significant role in marine ecosystems as part of the plankton community, serving as a food source for many marine organisms such as fish and zooplankton, and in biogeochemical cycles, especially in the deep ocean. Recent evidence based on both molecular and in situ imaging technologies suggests that the abundance and diversity of radiozoan species in the environment may be significant, although they are still likely to be under-represented.

Human Significance: Radiozoa do not have any direct economic importance to humans.

Threatened species as per IUCN: No species are included under IUCN as Threatened species.

Protected Species as per WPA (2022): No species are included under any schedule as per the WPA (2022)

Species under CITES: Indian radiozoan species are not listed under any appendices of CITES.

Invasive alien species: No species are known to be invasive.

Gap areas: Radiozoans are poorly documented from most of the coastal states (except single records from Odisha, Tamil Nadu) and Union Territories (except from Andaman and Nicobar Islands). Moreover, acantharians all across the Indian Exclusive Economic Zone are poorly documented in terms of their distribution, ecology, biogeography.

Taxonomy

Phylum RADIOZOA Cavalier-Smith 1987

Class ACANTHARIA Haeckel, 1881

Order ARTHRACANTHIDA Schewiakoff, 1926

Family ACANTHOMETRIDAE Haeckel, 1887

Genus *Acanthometra* J. Müller, 1856

1. *Acanthometra bulbosa* Haeckel, 1860

2. *Acanthometra pellucida* Müller, 1858

Genus *Acanthometron* Haeckel, 1887

3. *Acanthometron* sp.

Genus *Amphilonche* Haeckel, 1860

4. *Amphilonche elongata* (Müller, 1858)

Family DORATASPIDAE Haeckel, 1887

Genus *Hystrichaspis* Haeckel 1887

5. *Hystrichaspis dorsata* Haeckel, 1887

Family PHYLLOSTAUURIDAE Schewiakoff, 1926

Genus *Acanthostaurus* Haeckel, 1862

6. *Acanthostaurus purpurascens* (Haeckel, 1860)

7. *Acanthostaurus* sp.

Order HOLACANTHIDA Schewiakoff, 1926

Family ACANTHOCHIASMIDAE Haeckel, 1862

Genus *Acanthochiasma* Krohn, 1861

8. *Acanthochiasma fusiforme* Haeckel, 1861

9. *Acanthochiasma rubescens* Haeckel, 1862

Order SYMPHYACANTHIDA Schewiakoff, 1926

Family AMPHILITHIIDAE Haeckel, 1882, emend. Schewiakoff, 1926

Genus *Amphibelone* Haeckel, 1862

10. *Amphibelone* sp.

Class POLYCYSTINA Ehrenberg, 1838

Order NASSELLARIA Ehrenberg, 1875

Family ARTOSTROBIIDAE Riedel, 1967 emend. Foreman, 1973

Genus *Botryostrobos* Haeckel, 1887 emend. Nigrini, 1977

11. *Botryostrobos aquilonaris* (Bailey) Johnson, 1974

12. *Botryostrobos auritus-australis* Ehrenberg, 1844

Genus *Phormostichoartus* Campbell, 1951 emend. Nigrini, 1977

13. *Phormostichoartus corbula* (Harting) Nigrini, 1977

- Genus *Siphocampe* Haeckel 1882
14. *Siphocampe arachnea* (Ehrenberg) Nigrini, 1977
15. *Siphocampe lineata* (Ehrenberg) Nigrini, 1977
- Genus *Spirocyrtis* Haeckel 1882
16. *Spirocyrtis scalaris* Haeckel, 1887
17. *Spirocyrtis subscalaris* Nigrini, 1977
- Family CANNOBOTRYIDAE Haeckel, 1881 emend. Riedel, 1967
- Genus *Acrobotrys* Haeckel 1881
18. *Acrobotrys* sp.
- Genus *Botryocyrtis* Ehrenberg, 1860
19. *Botryocyrtis scutum* (Harting) Nigrini, 1967
- Genus *Centrobotrys* Petrushevskaya 1965
20. *Centrobotrys thermophila* Petrushevskaya, 1965
- Family CARPOCANIIDAE Haeckel, 1881 emend. Riedel, 1967
- Genus *Carpocanarium* Haeckel, 1887
21. *Carpocanarium papillosum* (Ehrenberg, 1872)
22. *Carpocanarium* sp.
- Genus *Carpocanistrum* Haeckel, 1887
23. *Carpocanistrum* spp.
- Genus *Carpocanopsis* Riedel & Sanfilippo 1971
24. *Carpocanopsis favosa* (Haeckel) Kruglivkova, 1978
- Family COLLOZOIDAE Haeckel, 1862
- Genus *Acrosphaera* Haeckel 1882
25. *Acrosphaera lappacea* (Haeckel) Johnson & Nigrini, 1980
26. *Acrosphaera spinosa* Caulet, 1986
- Genus *Buccinosphaera* Haeckel, 1887
27. *Buccinosphaera invaginata* Haeckel, 1887
- Genus *Collosphaera* Müller, 1859
28. *Collosphaera huxleyi* Mueller, 1855
29. *Collosphaera macropora* Popofsky, 1917
30. *Collosphaera tuberosa* Haeckel, 1887
- Genus *Disolenia* Ehrenberg, 1861
31. *Disolenia quadrata* (Ehrenberg) Nigrini, 1967
- Genus *Otosphaera* Haeckel, 1887, emend. Nigrini, 1967
32. *Otosphaera auriculata* Haeckel, 1887
- Genus *Siphonosphaera* Muller, 1858
33. *Siphonosphaera polysiphonia* Haeckel, 1887
- Genus *Solenosphaera* Haeckel, 1887
34. *Solenosphaera zanguebarica* Brandt, 1905
- Genus *Sphaerozoum* Meyen 1834
35. *Sphaerozoum ovodimare* Haeckel 1860
- Family PLAGIACANTHIDAE Hertwig, 1879
- Genus *Arachnocorys* Haeckel 1861
36. *Arachnocorys circumtexta* Haeckel, 1860
- Genus *Callimitra* Haeckel 1882
37. *Callimitra solocicibrata* Takahashi 1991
- Genus *Ceratocyrtis* Bütschli 1882
38. *Ceratocyrtis histicosa* (Joergensen) Petrushevskaya, 1971
- Genus *Lampromitra* Haeckel 1882
39. *Lampromitra schultzei* (Haeckel) Takahashi, 1991
- Genus *Lithomelissa* Ehrenberg 1847
40. *Lithomelissa* spp.

- Genus *Peridium* Haeckel 1887
 41. *Peridium* sp.
 Family PTEROCORYTHIDAE Haeckel, 1881
 Genus *Anthocyrtdium* Haeckel, 1881
 42. *Anthocyrtdium ophirensis* (Ehrenberg) Petrushevskaya, 1968
 43. *Anthocyrtdium zanguebaricum* (Ehrenberg) Haeckel, 1887
 Genus *Lamprocyclus* Haeckel 1881
 44. *Lamprocyclus hannai* (Campbell & Clark) Sanfilippo, Westberg-Smith & Riedel, 1985
 45. *Lamprocyclus maritalis* Haeckel, 1887
 Genus *Lamprocyrtis* Kling, 1973
 46. *Lamprocyrtis nigrinia* (Cautlet) Kling, 1973
 Genus *Pterocorys* Haeckel, 1881
 47. *Pterocorys hertwigii* (Haeckel) Petrushevskaya, 1971
 48. *Pterocorys zancleus* (Mueller) Nigrini & Moore, 1979
 49. *Pterocorys* sp.
 Genus *Theocorythium* Haeckel, 1887
 50. *Theocorythium trachelium* (Ehrenberg) Nigrini, 1967
 Family THEOPERIDAE Haeckel, 1881 emend. Riedel, 1967
 Genus *Cornutella* Ehrenberg, 1838
 51. *Cornutella profunda* Ehrenberg, 1856
 Genus *Dictyophimus* Ehrenberg, 1847 emend. Nigrini, 1968
 52. *Dictyophimus crisiae* Ehrenberg, 1854
 Genus *Eucecryphalus* Haeckel 1861
 53. *Eucecryphalus* sp.
 Genus *Eucyrtidium* Ehrenberg, 1847 emend. Nigrini, 1967
 54. *Eucyrtidium acuminatum* (Ehrenberg) Ehrenberg, 1847
 55. *Eucyrtidium hexagonatum* Haeckel, 1887
 Genus *Lithopera* Ehrenberg 1846
 56. *Lithopera bacca* Ehrenberg, 1872
 Genus *Pterocanium* Ehrenberg, 1847
 57. *Pterocanium charybdeum* (Müller, 1858)
 58. *Pterocanium praetextum* (Ehrenberg) Haeckel, 1887
 Genus *Theocorys* Haeckel 1882
 59. *Theocorys* sp.
 Family TRISSOCYCLIDAE Haeckel, 1881, emend. Goll, 1968
 Genus *Acanthodesmia* Müller 1857
 60. *Acanthodesmia vinculata* Mueller, 1858
 Genus *Amphispyris* Haeckel 1882
 61. *Amphispyris reticulata* (Ehrenberg, 1872)
 Genus *Lophospyris* Haeckel, 1881 emend. Goll, 1977
 62. *Lophospyris pentagona* (Ehrenberg) Petrushevskaya, 1971
 Genus *Nephrospyris* Haeckel, 1887
 63. *Nephrospyris* spp.
 Genus *Phormospyris* Haeckel, 1881 emend. Goll, 1977
 64. *Phormospyris stabilis* Goll, 1976
 Genus *Tholospyris* Haeckel 1882
 65. *Tholospyris anthophora* (Haeckel, 1887)
 Order SPUMELLARIA Ehrenberg, 1875
 Family ACTINOMMIDAE Haeckel, 1862, emend. Riedel, 1967
 Genus *Actinomma* Haeckel, 1860, emend. Nigrini, 1967
 66. *Actinomma arcadophorum* (Haeckel, 1887)
 67. *Actinomma leptodermum* (Jorgensen) Nigrini & Moore, 1979

68. *Actinomma medianum* Nigrini, 1967
Genus **Anomalacantha** Loeblich & Tappan, 1961
69. *Anomalacantha dentata* Mast, 1910
Genus **Arachnosphaera**
70. *Arachnosphaera* sp.
Genus **Carposphaera** Haeckel 1882
71. *Carposphaera acanthophora* (Popofsky) Benson, 1966
Genus **Centroculus** Haeckel 1887
72. *Centroculus cladostylus* Haeckel, 1887
Genus **Cladococcus** Mueller, 1856
73. *Cladococcus* spp.
Genus **Cromyomma** Haeckel 1862
74. *Cromyomma circumtextum* Haeckel, 1887
Genus **Drupptractus** Haeckel 1887
75. *Drupptractus irregularis* Popofsky, 1912
Genus **Drymosphaera** Haeckel 1882
76. *Drymosphaera polygonalis* Haeckel, 1887
Genus **Hexacantium** Haeckel, 1881
77. *Hexacantium* sp.
Genus **Hexalonche** Haeckel 1882
78. *Hexalonche* sp.
Genus **Hexastylus** Haeckel 1882
79. *Hexastylus dimensivus* Haeckel, 1887
Genus **Saturnalis** Haeckel 1882
80. *Saturnalis circularis* Haeckel, 1887
Genus **Spongosphaera** Ehrenberg, 1847
81. *Spongosphaera streptacantha* Haeckel, 1860
Genus **Stylatractus** Haeckel 1887
82. *Stylatractus* spp.
Genus **Styptosphaera** Haeckel, 1887
83. *Styptosphaera* spp.
Family COCCODISCIDAE Haeckel, 1862
- Genus **Didymocyrtis** Haeckel 1861
84. *Didymocyrtis tetrathalamus* (Haeckel) Sanfilippo & Riedel, 1980
Family HELIODISCIDAE Haeckel 1881
- Genus **Heliodiscus** Haeckel, 1862 emend. Nigrini, 1967
85. *Heliodiscus asteriscus* Haeckel, 1887
86. *Heliodiscus echiniscus* Haeckel, 1887
Family LITHELIIDAE Haeckel, 1862
- Genus **Larcopyle** Dreyer, 1889
87. *Larcopyle buetschlii* Dreyer, 1889
88. *Larcopyle* spp.
Genus **Lithelius** Haeckel, 1862
89. *Lithelius minor* Joergensen, 1900
90. *Lithelius nautiloides* Popofsky, 1908
Genus **Larcospira** Haeckel, 1887
91. *Larcospira quadrangula* Haeckel, 1887
Family PYLONIIDAE Haeckel, 1881
- Genus **Circodiscus** Kozlova 1972
92. *Circodiscus microporus* (Stoehr) Petrushevskaya & Kozlova, 1972
Genus **Hexapyle** Haeckel 1881
93. *Hexapyle dodecantha* Haeckel, 1887

- Genus **Phorticium** Haeckel 1882
 94. *Phorticium pylonium* Haeckel, 1887
 Genus **Octopyle** Haeckel 1881
 95. *Octopyle stenoazona* Haeckel, 1887
 Genus **Tetrapyle** Muller, 1858
 96. *Tetrapyle octacantha* Mueller, 1858
 Family SPONGODISCIDAE Haeckel, 1862 emend. Riedel, 1967
 Genus **Amphirhopalum** Haeckel, 1881 emend. Nigrini, 1967
 97. *Amphirhopalum ypsilon* Haeckel, 1887
 Genus **Dictyocoryne** Ehrenberg, 1860
 98 *Dictyocoryne euclidis* Haeckel 1887
 99. *Dictyocoryne profunda* (Ehrenberg, 1872)
 100. *Dictyocoryne truncatum* (Ehrenberg) Nigrini & Moore, 1979
 Genus **Euchitonia** Ehrenberg 1861
 101. *Euchitonia elegans* (Haeckel, 1887)
 102. *Euchitonia furcata* (Ehrenberg, 1872)
 Genus **Hymeniastrum** Ehrenberg 1846
 103. *Hymeniastrum* spp.
 Genus **Porodiscus** Haeckel 1882
 104. *Porodiscus* sp.
 Genus **Spongaster** Ehrenberg, 1860
 105. *Spongaster tetras* Ehrenberg, 1860
 Genus **Spongodiscus** Ehrenberg, 1884
 106. *Spongodiscus* spp.
 Genus **Spongopyle** Dreyer, 1889
 107. *Spongopyle osculosa* Dreyer, 1889
 Genus **Spongotrochus** Haeckel, 1860
 108. *Spongotrochus glacialis* Popofsky, 1908
 Genus **Spongurus** Haeckel, 1860
 109. *Spongurus cylindricus* Haeckel, 1860
 110. *Spongurus elliptica* (Ehrenberg, 1872)
 Genus **Stylochlamyidium** Haeckel 1887
 111. *Stylochlamyidium asteriscus* Haeckel, 1887
 112. *Stylochlamyidium venustum* (Bailey) Haeckel, 1887
 Genus **Stylodictya** Ehrenberg, 1847 emend. Kozlova, 1972
 113. *Stylodictya aculeata* Joergensen, 1905
 114. *Stylodictya validispina* Joergensen, 1905
 Family THOLONIIDAE Haeckel, 1887 Genus **Cubotholus** Haeckel 1887
 115. *Cubotholus* sp.

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