FAUNA OF INDIA CHECKLIST

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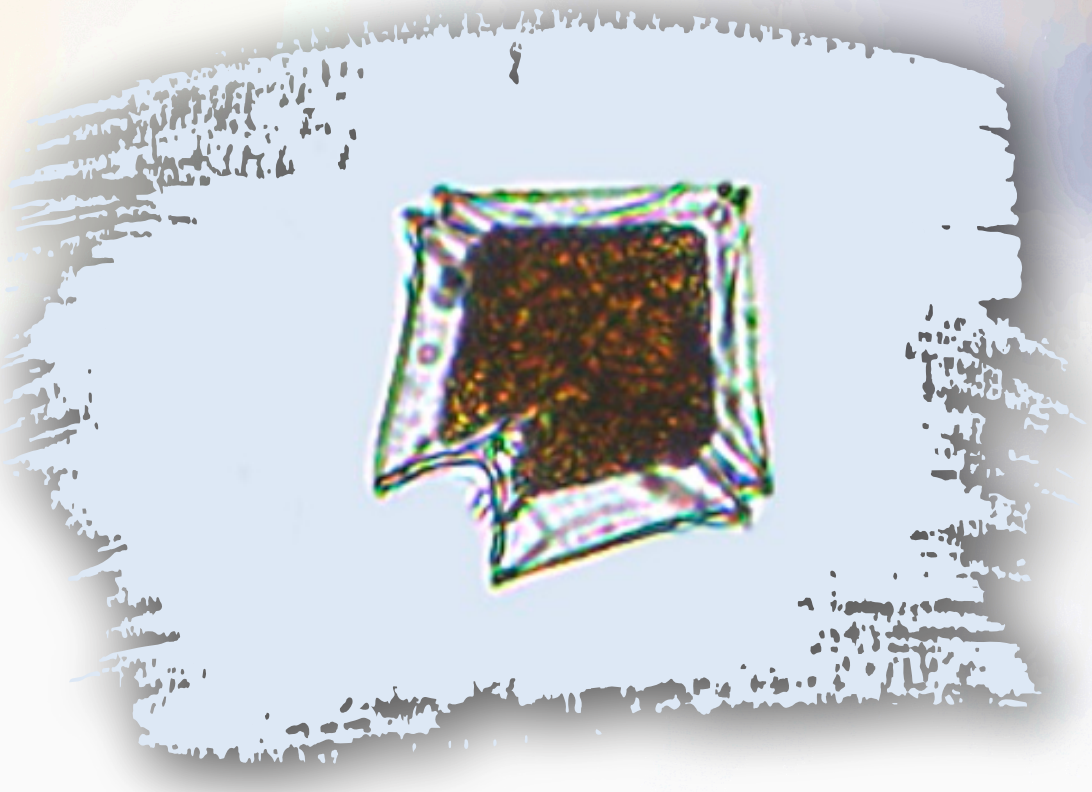

MYZOZOA: DINOZOA: DINOFLAGELLATA, Bütschli, 1885 (Marine)

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

MYZOZOA: DINOZOA: DINOFLAGELLATA (MARINE)

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Introduction: Dinoflagellates (Phylum Myzozoa, Infraphylum Dinoflagellata) are a myriad group of ecologically complex organisms that includes over 2000 taxonomically described extant species, 90% of which are marine, with sizes ranging from 2 µm to 2 mm. They are protists with a variety of morphologies and trophic levels within the food chain, inhabiting a diverse range of ecological niches. Their survival stems from a multitude of ecological and functional tactics such as their dietary adaptability (Glibert et al. 2008), capacity for symbiotic or parasitic relationships (Hoppenrath et al. 2014), bioluminescence, and production of bioactive secondary metabolites which are critical for allelopathic interactions (Tillmann et al. 2008). The trophic roles of dinoflagellates range from pure autotrophs to heterotrophs, with a combination of both mechanisms to display mixotrophy. Dinoflagellates thus undermine the conventional concepts of functional groupings in biological oceanography as they are included within the phytoplankton and zooplankton categories. The mixotrophic and heterotrophic species prey on organisms of various sizes and taxa; in turn, they are preyed upon by a variety of other zooplankton. Most dinoflagellates are morphologically characterised by two dissimilar flagella (with varied positions in dinokont or desmokont types) and their intricate cell walls giving them thecate or athecate appearance (Tomas, 1997). Dinoflagellate life-cycle differ greatly depending on the species with asexual reproduction being the most prevalent. Sexual reproduction may occur during unfavourable conditions resulting in the formation of resting cysts. Dinoflagellate cysts are non-motile with resistant walls made of dinosporin which settle at the sea floor and withstand the unfavourable conditions as compared to motile stages thereby broadening the tolerance range of species.

Global diversity: Marine planktonic dinoflagellates are distributed worldwide. The biogeographical distribution of dinoflagellates has been referred to as "modified latitudinal cosmopolitanism," which means that the same dinoflagellate morphospecies can be found within the same climatic zones in the northern and southern hemispheres. In the marine waters of the world, 2539 extant species of dinoflagellates are found, belonging to two classes, 26 orders and 82 families (Guiry & Guiry, 2023).

Diversity in India: In the Indian marine waters, 263 planktonic species belonging to one class, eight orders and 24 families have been reported so far.

Diversity in States:

Sl. No.	State/UT	No. of Species	No. of Invasive Species
1	Andhra Pradesh	33	1
2	Arunachal Pradesh	0	0
3	Assam	0	0
4	Bihar	0	0
5	Chhattisgarh	0	0
6	Gujarat	26	0
7	Goa	63	2

Sl. No.	State/UT	No. of Species	No. of Invasive Species
8	Haryana	0	0
9	Himachal Pradesh	0	0
10	Jharkhand	0	0
11	Karnataka	47	1
12	Kerala	41	0
13	Madhya Pradesh	0	0
14	Maharashtra	19	0
15	Manipur	0	0
16	Meghalaya	0	0
17	Mizoram	0	0
18	Nagaland	0	0
19	Odisha	28	0
20	Punjab	0	0
21	Rajasthan	0	0
22	Sikkim	0	0
23	Tamil Nadu	64	1
24	Telangana	0	0
25	Tripura	0	0
26	Uttar Pradesh	0	0
27	Uttarakhand	0	0
28	West Bengal	9	0
29	Andaman & Nicobar	22	1
30	Chandigarh	0	0
31	Dadra Nagar Haveli, Daman & Diu	4	0
32	Delhi	0	0
33	Jammu & Kashmir	0	0
34	Ladakh	0	0
35	Lakshadweep	16	0
36	Puducherry	0	0
37	State Unknown	184	2
	INDIA TOTAL	**263**	**4**

Endemism: True endemism is not present in any of the species recorded from Indian marine waters.

Habitat: They dwell in brackish, freshwater, marine environments; as planktonic as well as benthic, free living, symbiotic as well as parasitic forms (Tomas, 1997).

Ecological Significance: Dinoflagellates are a biochemically varied group that differ in terms of the number of kinds of photosynthetic pigments they possess, their capacity to produce toxins and the presence of bioluminescent characteristics. Being primary producers, they are critical for trophic energy transfer in marine food web and their phagotrophic counterparts are known to regulate microbial loop in the oceans. They are also key components in regulating global biogeochemical cycles and are important biological indicators of aquatic ecosystem. Many species possess significant ecological impacts including their ability to form symbiosis with marine animals (for instance, as zooxanthellae they underpin the coral reef ecosystem), parasitic relationships, harmful algal blooms (HABs), and their allellopathic activity. Conclusively dinoflagellates diversity and their abundance can be utilised as a gauge for assessing the ecosystem change and overall health.

Human Significance (Economic importance, human and veterinary importance): Dinoflagellates are particularly notable for their significant contribution in toxin production and harmful algal blooms (HABs) formation. By releasing toxins into the aquatic environment, their blooms can harm other aquatic biota and human health. Dinoflagellate toxins or dinotoxins can accumulate in fish and shellfish and cause catastrophic illnesses when consumed by humans. HABs occur as natural phenomena; historical records provide evidence of their presence far before anthropogenic causes had an impact on coastal ecosystems. Dinoflagellates that produce HABs have drawn increased attention because of the economic impact they have, and more research has been conducted to understand their effect and to develop control strategies. HABs are also known to cause respiratory irritations in humans, resulting in the closure of several beaches considering the possible health threats these blooms can pose in humans. Thus, it is well recognised that the HAB events have a concomitant impact on the travel and tourism sector.

Threatened species as per IUCN (Numbers under different categories) *: No species are included under IUCN as Threatened species.

Protected Species as per WPA (2022) (Number of species in different schedules) : No species are included under any schedule as per the WPA (2022)

Species under CITES (Number of species) : No Indian species are listed under any appendices of CITES.

Invasive alien species (Number of species): 4 invasive species: *Alexandrium catenella* (Whedon & Kofoid) Balech 1985; *Alexandrium minutum* Halim, 1960; *Alexandrium tamarense* (Lebour, 1925) Balech, 1995; *Gymnodinium catenatum* H.W.Graham 1943. These species mostly spread and extend their geographical range by means of translocation through ship ballast waters.

Gap areas : More research is needed in deep, oceanic waters. Research is needed to counter and manage the repeated instances of bloom formation, especially on the southern coasts of India. Despite their ecological significance, the genetic mechanisms for the ecological and functional strategies of dinoflagellates remain obscure. Advanced research efforts on these topics will provide potential information for confirmation of biosynthetic pathways and the development of novel bio-engineering applications.

Taxonomic List of Dinoflagellata Species (Marine) from India

	Taxonomy
	Phylum MYZOZOA Cavalier-Smith & Chao
	Infraphylum DINOFLAGELLATA Bütschli, 1885
	Class DINOPHYCEAE Fritsch, 1927
	Order AMPHIDINIALES Moestrup & Calado, 2018
	Family AMPHIDINIACEAE Moestrup & Calado, 2018
	Genus ***Amphidinium*** Claperède & Lachmann, 1859
1	*Amphidinium crassum* Lohmann 1908
	Order DINOPHYSIALES Lindemann, 1928
	Family AMPHISOLENIACEAE Lindemann, 1928
	Genus ***Amphisolenia*** Stein, 1883
2	*Amphisolenia astragalus* Kofoid & Michener, 1911
3	*Amphisolenia bidentata* Schröder, 1900
4	*Amphisolenia globifera* Stein, 1883
5	*Amphisolenia schauinslandii* Lemmermann, 1899
6	*Amphisolenia schroederi* Kofoid, 1907
7	*Amphisolenia spinulosa* Kofoid, 1907
8	*Amphisolenia thrinax* Schütt, 1893
	Genus ***Triposolenia*** Kofoid, 1906
9	*Triposolenia bicornis* Kofoid, 1906
	Family DINOPHYSACEAE Bütschli, 1885
	Genus ***Citharistes*** Stein, 1883
10	*Citharistes apsteinii* F.Schütt, 1895
	Genus ***Dinophysis*** Ehrenberg, 1839
11	*Dinophysis acuminata* Claparède & Lachmann, 1859
12	*Dinophysis acuta* (Ehrenberg, 1839)
13	*Dinophysis apicata* (Kofoid and Skogsberg) Abé 1967
14	*Dinophysis argus* (Stein) Abé 1967
15	*Dinophysis caudata* Saville-Kent, 1881
16	*Dinophysis dens* Pavillard, 1915
17	*Dinophysis exigua* Kofoid & Skogsberg, 1928
18	*Dinophysis expulsa* Kofoid & Michener, 1911
19	*Dinophysis fortii* Pavillard, 1924
20	*Dinophysis hastata* Stein, 1883
21	*Dinophysis infundibulum* J.Schiller 1928
22	*Dinophysis miles* Cleve, 1900
23	*Dinophysis norvegica* Claparède & Lachmann, 1859
24	*Dinophysis ovum* (F.Schütt) T.H.Abé
25	*Dinophysis parvula* (Schütt) Balech, 1967
26	*Dinophysis punctata* Jörgensen, 1923
27	*Dinophysis schuettii* Murray & Whitting, 1899
28	*Dinophysis swezyae* Kofoid & Skogsberg, 1928
29	*Dinophysis tripos* Gourret, 1883

30	*Dinophysis uracantha* Stein, 1883
	Genus ***Histioneis*** Stein, 1883
31	*Histioneis biremis* Stein, 1883
32	*Histioneis carinata* Kofoid, 1907
33	*Histioneis costata* Kofoid & Michener, 1911
34	*Histioneis depressa* Schiller, 1928
35	*Histioneis highleyi* Murray & Whitting, 1899
36	*Histioneis hyalina* (Kofoid and Michener,1911)
37	*Histioneis milneri* Murray & Whitting, 1899
38	*Histioneis mitchellana* Murray & Whitting, 1899
39	*Histioneis panda* Kofoid & Michener, 1911
40	*Histioneis pulchra* Kofoid, 1907
41	*Histioneis striata* (Kofoid and Michener, 1911)
	Genus ***Ornithocercus*** Stein, 1883
42	*Ornithocercus formosus* Kofoid & Michener, 1911
43	*Ornithocercus francescae* (Murray) Balech, 1962
44	*Ornithocercus heteroporus* Kofoid, 1907
45	*Ornithocercus magnificus* (Stein, 1883)
46	*Ornithocercus quadratus* (Schutt,1990)
47	*Ornithocercus skogsbergii (Abé, 1967)*
48	*Ornithocercus splendidus* Schütt, 1895
49	*Ornithocercus steinii* (Schutt,1990)
50	*Ornithocercus thumii* (Kofoid and Skogsberg,1928)
	Genus ***Parahistioneis*** Kofoid & Skogsberg, 1928
51	*Parahistioneis para* (Kofoid and Skogsberg, 1928)
	Genus ***Phalacroma*** Stein, 1883
52	*Phalacroma acutum* (F.Schütt) Pavillard, 1916
53	*Phalacroma circumcinctum* Kofoid & Michener, 1911
54	*Phalacroma cuneus* (Schutt, 1895)
55	*Phalacroma doryphorum (Stein, 1883)*
56	*Phalacroma favus* (Kofoid and Michener, 1911)
57	*Phalacroma mitra* (Schutt,1895)
58	*Phalacroma rapa* (Jorgensen, 1923)
59	*Phalacroma rotundatum* (Claparéde & Lachmann) Kofoid & Michener, 1911
	Order GONYAULACALES Taylor, 1980
	Family CERATIACEAE Kofoid, 1907
	Genus ***Ceratium*** F.Schrank, 1793
60	*Ceratium hirundinella* (O.F. Muller) Dujardin, 1841
	Genus ***Tripos*** Bory de Saint-Vincent, 1823
61	*Tripos arietinus* (Cleve) F.Gómez, 2013
62	*Tripos axialis* (Kofoid) F.Gómez, 2013
63	*Tripos azoricus* (Cleve) F.Gómez, 2013
64	*Tripos belone (*Cleve) F.Gómez, 2013
65	*Tripos bigelowii* (Kofoid) F.Gómez, 2013
66	*Tripos brevis* (Ostenfeld & Schmidt) F.Gómez, 2013

67	*Tripos bucephalus* (Cleve) F.Gómez, 2013
68	*Tripos candelabrus* (Pouchet) F.Gómez, 2013
69	*Tripos carriensis* (Gourret) F.Gómez, 2013
70	*Tripos concilians* (Jørgenen) F.Gómez, 2013
71	*Tripos contortus* (Gourret) F.Gómez, 2013
72	*Tripos declinatus* (G.Karsten) F.Gómez, 2013
73	*Tripos deflexus* (Kofoid) F.Gómez, 2014
74	*Tripos dens* (Ostenfeld & Johannes Schmidt) F.Gómez, 2013
75	*Tripos euarcuatus* (Jørgensen) F.Gómez, 2013
76	*Tripos extensus* (Gourret) F.Gómez, 2013
77	*Tripos falcatiformis* (Jørgensen) F.Gómez, 2013
78	*Tripos falcatus* (Kofoid) F.Gómez, 2013
79	*Tripos furca* (Ehrenberg) F.Gómez, 2013
80	*Tripos fusus* (Ehrenberg) F.Gómez, 2013
81	*Tripos gallicus* (Kofoid) F.Gómez, 2013
82	*Tripos gibberus* (Gourret) F.Gómez, 2013
83	*Tripos gravidus* (Gourret) F.Gómez, 2013
84	*Tripos hexacanthus* (Gourret) F.Gómez, 2013
85	*Tripos horridus* (Cleve) F.Gómez, 2013
86	*Tripos humilis* (Jörgenen) F.Gómez, 2013
87	*Tripos inflatus* (Kofoid) F.Gómez, 2013
88	*Tripos karstenii* (Pavillard) F.Gómez, 1907
89	*Tripos kofoidii* (Jörgenen) F.Gómez, 2013
90	*Tripos lineatus* (Ehrenberg) F.Gómez, 2013
91	*Tripos longipes* (J.W. Bailey) F.Gómez, 2013
92	*Tripos longirostrus* (Gourret) F.Gómez, 2013
93	*Tripos longissimus* (Schröder) F.Gómez, 2013
94	*Tripos lunula* (Schimper ex Karsten) F.Gómez, 2013
95	*Tripos massiliensis* (Gourret) F.Gómez, 2013
96	*Tripos macroceros* (Ehrenberg) F.Gómez, 2013
97	*Tripos minutus* (Jørgensen) F.Gómez 2013
98	*Tripos muelleri* Bory de Saint-Vincent, 1827
99	*Tripos paradoxides* (Cleve) F.Gómez, 2013
100	*Tripos pavillardii* (Jørgensen) F.Gómez 2013
101	*Tripos pentagonus* (Gourret) F.Gómez, 2013
102	*Tripos platycornis* (Daday) F.Gómez 2021
103	*Tripos ranipes* (Cleve) F.Gómez 2013
104	*Tripos recurvus* (Jørgesen) F.Gómez, 2013
105	*Tripos schmidtii* (Jørgesen) F.Gómez, 2013
106	*Tripos schroeteri* (B.Schröder) F.Gómez, 2013
107	*Tripos setaceus* (Jørgesen) F.Gómez, 2013
108	*Tripos sumatranus* (Karsten) F.Gómez, 2013
109	*Tripos symmetricus* (Pavillard) F.Gómez 2021
110	*Tripos teres* (Kofoid) F.Gómez, 2013
111	*Tripos trichoceros* (Ehrenberg) Gómez, 2013

112	*Tripos vultur* (Cleve) F.Gómez, 2013
	Family GONYAULACACEAE Lindemann, 1928
	Genus ***Gonyaulax*** Diesing, 1866
113	*Gonyaulax brevisulcatum* P.A.Dangeard 1927
114	*Gonyaulax ceratocoroides* Kofoid, 1910
115	*Gonyaulax diegensis* Kofoid, 1911
116	*Gonyaulax fragilis* (Schütt) Kofoid, 1911
117	*Gonyaulax kofoidii* Pavillard, 1909
118	*Gonyaulax milneri* (Murray & Whitting) Kofoid, 1911
119	*Gonyaulax minima* Matzenauer, 1933
120	*Gonyaulax pacifica* Kofoid 1907
121	*Gonyaulax pavillardii* Kofoid & Michener, 1911
122	*Gonyaulax polygramma* Stein, 1883
123	*Gonyaulax spinifera* (Claparède & Lachmann) Diesing, 1866
	Genus ***Lingulodinium*** D.Wall, 1967
124	*Lingulodinium polyedra* (F.Stein) J.D.Dodge, 1989
	Genus ***Protoceratium*** Bergh, 1881
125	*Protoceratium reticulatum* (Claparède & Lachmann) Bütschli, 1885
126	*Protoceratium spinulosum* (Murray & Whitting) Schiller, 1937
	Family HETERODINIACEAE Lindemann, 1928
	Genus ***Heterodinium*** Kofoid, 1906
127	*Heterodinium blackmanii* (Kofoid, 1906)
128	*Heterodinium fides* Kofoid, 1907
	Family LINGULODINIACEAE W.A.Sarjeant & C.Downie
	Genus ***Sourniaea*** H.Gu, K.N.Mertens, Zhun Li & H.H.Shin, 2020
129	*Sourniaea diacantha* (Meunier) H.Gu., K.N.Mertens, Zhun Li & H.H.Shin 2020
	Family OSTREOPSIDACEAE Lindemann, 1928
	Genus ***Alexandrium*** Halim, 1960
130	*Alexandrium catenella* (Whedon & Kofoid) Balech 1985
131	*Alexandrium insuetum* Balech, 1985
132	*Alexandrium minutum* Halim, 1960
133	*Alexandrium ostenfeldii* (Paulsen) Balech & Tangen 1985
134	*Alexandrium tamarense* (Lebour, 1925) Balech, 1995
	Family PYROPHACACEAE Lindemann, 1928
	Genus ***Pyrophacus*** Stein, 1883
135	*Pyrophacus horologium* Stein, 1883
136	*Pyrophacus steinii* (Schiller) Wall & Dale, 1971
137	*Pyrophacus vancampoae* (R.Rossignol) Wall & Dale, 1971
	Order GYMNODINIALES Lemmermann, 1910
	Family BRACHIDINIACEAE Sournia, 1972
	Genus ***Karenia*** Gert Hansen & Moestrup, 2000
138	*Karenia brevis* (C.C.Davis) Gert Hansen & Ø.Moestrup, 2000
139	*Karenia mikimotoi* (Miyake & Kominami ex Oda) Gert Hansen & Moestrup, 2000
140	*Karenia selliformis* A.J.Haywood, K.A.Steidinger & L.MacKenzie 2004
	Family GYMNODINIACEAE Lankester, 1885

	Genus ***Akashiwo*** Gert Hansen & Moestrup, 2000
141	*Akashiwo sanguinea* (K.Hirasaka) G.Hansen & Ø.Moestrup, 2000
	Genus ***Gymnodinium*** F. Stein, 1878
142	*Gymnodinium abbreviatum* (Kofoid & Swezy, 1921)
143	*Gymnodinium catenatum* H.W.Graham 1943
144	*Gymnodinium impudicum* (S.Fraga & I.Bravo) Gert Hansen & Ø.Moestrup, 2000
	Genus ***Gyrodinium*** Kofoid & Swezy, 1921
145	*Gyrodinium spirale* (Bergh) Kofoid & Swezy 1921
	Genus ***Margalefidinium*** F.Gómez, Richlen & D.M.Anderson, 2017
146	*Margalefidinium citron* (Kofoid & Swezy) F.Gómez, Richlen & D.M.Anderson 2017
147	*Margalefidinium polykrikoides* (Margalef) F.Gómez, Richlen & D.M.Anderson 2017
	Genus ***Torodinium*** Kofoid & Swezy, 1921
148	*Torodinium teredo* (Pouchet) Kofoid & Swezy, 1921
	Family POLYKRIKACEAE Kofoid & Swezy, 1921
	Genus ***Polykrikos*** Bütschli, 1873
149	*Polykrikos hartmannii* W.M.Zimmermann 1930
150	*Polykrikos kofoidii* Chatton, 1914
151	*Polykrikos schwartzii* Bütschli, 1873
	Family PTYCHODISCACEAE (Schütt) Lemmermann, 1899
	Genus ***Balechina*** Loeblich & A.R.Loeblich, 1968
152	*Balechina gracilis* (Bergh) F.Gómez, Artigas & Gast 2021
	Genus ***Berghiella*** Kofoid & J.R.Michener, 1911
153	*Berghiella josephinae* F.J.R. Taylor 1976
	Family GYMNODINIALES incertae sedis
	Genus ***Levanderina*** Ø.Moestrup, P.Hakanen, G.Hansen, N.Daugbjerg & M.Ellegaard, 2014
154	*Levanderina fissa* (Levander) Ø.Moestrup, P.Hakanen, G.Hansen, N.Daugbjerg & M.Ellegaard, 2014
	Order NOCTILUCALES Haeckel, 1894
	Family NOCTILUCACEAE Kent, 1881
	Genus ***Noctiluca*** Suriray, 1836
155	*Noctiluca scintillans* (Kofoid & Swezy, 1921)
	Family PROTODINIFERACEAE Kofoid & Swezy, 1921
	Genus ***Pronoctiluca*** Fabre-Domergue, 1889
156	*Pronoctiluca pelagica* Fabre-Domergue, 1889
157	*Pronoctiluca spinifera* (Lohmann) Schiller, 1932
	Order PERIDINIALES Haeckel, 1894
	Family HETEROCAPSACEAE R.A. Fensome, F.J.R. Taylor, G. Norris, W.A.S. Sarjeant, D.I. Wharton & G.L. Williams
	Genus ***Heterocapsa*** F.Stein, 1883
158	*Heterocapsa niei* (A.R.Loeblich) L.C.Morrill & A.R.Loeblich 1981
	Family KRYPTOPERIDINIACEAE Er.Lindemann, 1925
	Genus ***Blixaea*** Gottschling, 2017
159	*Blixaea quinquecornis* (T.H.Abé) Gottschling 2017
	Family OXYTOXACEAE Lindemann, 1928
	Genus ***Oxytoxum*** Stein, 1883
160	*Oxytoxum scolopax* Stein, 1883

161	*Oxytoxum subulatum* Kofoid, 1907
	Family PERIDINIACEAE Ehrenberg, 1831
	Genus ***Peridinium*** Ehrenberg, 1830
162	*Peridinium quadridentatum* (F.Stein) Gert Hansen 1995
	Genus ***Scrippsiella*** Balech ex A.R.Loeblich III, 196
163	*Scrippsiella trochoidea* (Stein) Loeblich III, 1976
	Family PERIDINIIDA Bergh 1881
	Genus ***Archaeperidinium*** Jörgensen, 1912
164	*Archaeperidinium minutum* (Kofoid) Jørgensen, 1912
	Genus ***Spiraulax*** Kofoid, 1911
165	*Spiraulax jolliffei* (Murray & Whitting) Kofoid, 1911
166	*Spiraulax kofoidii* H.W.Graham, 1942
	Family PODOLAMPADACEAE Lindemann, 1928
	Genus ***Podolampas*** Stein, 1883
167	*Podolampas bipes* (Stein, 1883)
168	*Podolampas elegans* (Schütt, 1895)
169	*Podolampas palmipes* (Stein, 1883)
170	*Podolampas reticulata* (Kofoid, 1907)
171	*Podolampas spinifera* (Okamura, 1912)
	Family PROTOPERIDINIACEAE J.P. Bujak & E.H. Davies
	Genus ***Diplopelta*** F.Stein ex E.Jørgensen, 1912
172	*Diplopelta parva* (T.H.Abé) K.Matsuoka, 1988
	Genus ***Diplopsalis*** Bergh, 1881
173	*Diplopsalis lenticula* (Kissilev, 1935)
174	*Diplopsalis saecularis* Murray & Whitting, 1899
	Genus ***Diplopsalopsis*** Meunier, 1910
175	*Diplopsalopsis bomba* (Stein) J.D.Dodge & S.Toriumi, 1993
	Genus ***Gotoius*** T.H.Abé ex Matsuoka, 1988
176	*Gotoius abei* K.Matsuoka, 1988
	Genus ***Lebouraia*** T.H.Abé, 1941
177	*Lebouraia minuta* T.H.Abé, 1941
	Genus ***Preperidinium*** Mangin, 1913
178	*Preperidinium meunieri* (Pavillard) Elbrächter, 1993
	Genus ***Protoperidinium*** Bergh, 1881
179	*Protoperidinium abei* (Paulsen) Balech 1974
180	*Protoperidinium achromaticum* (Levander) Balech 1974
181	*Protoperidinium americanum* (Gran & Braarud, 1935) Balech, 1974
182	*Protoperidinium asymmetricum* (Abé, 1927) Balech, 1974
183	*Protoperidinium avellana* (Meunier, 1919) Balech, 1974
184	*Protoperidinium bipes* (Paulsen) Balech 1974
185	*Protoperidinium breve* (Balech, 1974)
186	*Protoperidinium brevipes* (Balech, 1974)
187	*Protoperidinium brochii* (Kofoid & Swezy, 1921) Balech, 1974
188	*Protoperidinium cerasus* (Paulsen) Balech 1973
189	*Protoperidinium claudicans* (Paulsen) Balech 1974

190	*Protoperidinium compressum* (Abé, 1927) Balech, 1974
191	*Protoperidinium conicum* (Balech, 1974)
192	*Protoperidinium crassipes* (Balech, 1974)
193	*Protoperidinium curtipes* (Balech, 1974)
194	*Protoperidinium denticulatum* (Gran & Braarud, 1935) Balech, 1974
195	*Protoperidinium depressum*(Balech, 1974)
196	*Protoperidinium diabolum* (Cleve, 1900) Balech, 1974
197	*Protoperidinium divaricatum* (Meunier) Balech, 1988
198	*Protoperidinium divergens* (Balech, 1974)
199	*Protoperidinium elegans* (Cleve, 1900) Balech, 1974
200	*Protoperidinium excentricum* (Paulsen, 1907) Balech, 1974
201	*Protoperidinium fatulipes* (Balech, 1974)
202	*Protoperidinium globulus* (Balech, 1974)
203	*Protoperidinium grande* (Kofoid, 1907) Balech, 1974
204	*Protoperidinium granii* (Balech, 1974)
205	*Protoperidinium heteracanthum* (Balech, 1974)
206	*Protoperidinium inflatum* (Okamura) Balech 1974
207	*Protoperidinium latispinum* (Mangin, 1926) Balech, 1974
208	*Protoperidinium latistriatum* (Balech, 1974)
209	*Protoperidinium leonis* (Pavillard, 1916) Balech, 1974
210	*Protoperidinium longicollum* Pavillard 1916
211	*Protoperidinium marielebouriae* (Paulsen) Balech 1974
212	*Protoperidinium mite* (Pavillard) Balech 1974
213	*Protoperidinium nudum* (Meunier, 1919) Balech, 1974
214	*Protoperidinium oblongum* (Parke & Dodge, 1976)
215	*Protoperidinium obtusum* (Karsten) Parke & Dodge, 1976
216	*Protoperidinium oceanicum* (Balech, 1974)
217	*Protoperidinium ovatum* (Pouchet, 1883)
218	*Protoperidinium ovum* (Schiller, 1911) Balech, 1974
219	*Protoperidinium pacificum* (Kofoid & Michener) F.J.R.Taylor & Balech ex Balech, 1988
220	*Protoperidinium pallidum* (Ostenfeld, 1899) Balech, 1973
221	*Protoperidinium paradoxum* (F.J.R.Taylor) Balech 1994
222	*Protoperidinium pedunculatum* (Schütt, 1895) Balech, 1974
223	*Protoperidinium pellucidum* (Bergh, 1881)
224	*Protoperidinium pentagonum* (Gran, 1902) Balech, 1974
225	*Protoperidinium persicum* (J.Schiller) Okolodkov 2008
226	*Protoperidinium punctulatum* (Paulsen) Balech 1974
227	*Protoperidinium pyriforme* (Paulsen, 1905) Balech, 1974
228	*Protoperidinium quarnerense* (B.Schröder, 1900) Balech, 1974
229	*Protoperidinium sinaicum* (Matzenauer, 1933) Balech, 1974
230	*Protoperidinium solidicorne* (Mangin, 1926) Balech, 1974
231	*Protoperidinium steinii* (Balech, 1974)
232	*Protoperidinium stellatum* (D.Wall) M.Head, 1999
233	*Protoperidinium subinerme* (Paulsen) Loeblich III, 1969
234	*Protoperidinium subpyriforme* (P.-A.Dangeard, 1927) Balech, 1974

235	*Protoperidinium thorianum* (Paulsen, 1905) Balech, 1974
236	*Protoperidinium tenuissimum* (Kofoid) Balech 1974
237	*Protoperidinium tristylum* (Stein) Balech 1974
238	*Protoperidinium tuba* (Balech, 1974)
239	*Protoperidinium venustum* (Matzenauer, 1933) Balech, 1974
	Order PROROCENTRALES Lemmermann, 1910
	Family PROROCENTRACEAE Stein, 1883
	Genus ***Prorocentrum*** Ehrenberg, 1834
240	*Prorocentrum arcuatum* Issel, 1928
241	*Prorocentrum balticum* (Lohmann) Loeblich, 1970
242	*Prorocentrum concavum* Y.Fukuyo, 1981
243	*Prorocentrum cordatum* (Ostenfeld) J.D.Dodge, 1975
244	*Prorocentrum dentatum* Stein, 1883
245	*Prorocentrum gracile* Schütt, 1895
246	*Prorocentrum hoffmannianum* M.A.Faust, 1990
247	*Prorocentrum lenticulatum* (Matzenauer) F.J.R.Taylor, 1976
248	*Prorocentrum lima* (Ehrenberg) F.Stein, 1878
249	*Prorocentrum magnum* (Gaarder) J.D.Dodge, 1975
250	*Prorocentrum maximum* (Gourret) Schiller, 1937
251	*Prorocentrum mexicanum* Osorio-Tafall, 1942
252	*Prorocentrum micans* Ehrenberg, 1834
253	*Prorocentrum obtusum* Ostenfeld, 1908
254	*Prorocentrum ovale* (Gourret) J.Schiller, 1931
255	*Prorocentrum rostratum* Stein, 1883
256	*Prorocentrum scutellum* Schröder, 1900
257	*Prorocentrum triestinum* J.Schiller, 1918
	Order PYROCYSTALES Apstein, 1909
	Family PYROCYSTACEAE (Schütt, 1896) Lemmermann, 1899
	Genus ***Pyrocystis*** J.Murray ex Haeckel, 1890
258	*Pyrocystis fusiformis* C.W.Thomson, 1876
259	*Pyrocystis hamulus* Cleve, 1900
260	*Pyrocystis lunula* (Schütt) Schütt, 1896
261	*Pyrocystis pseudonoctiluca* Wyville-Thompson, 1876
262	*Pyrocystis rhomboides* (Matzenauer) Schiller, 1937
263	*Pyrocystis robusta* Kofoid, 1907

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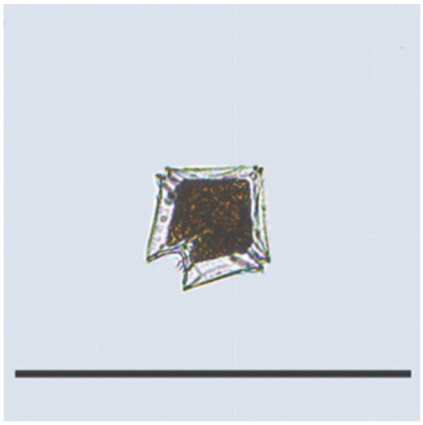
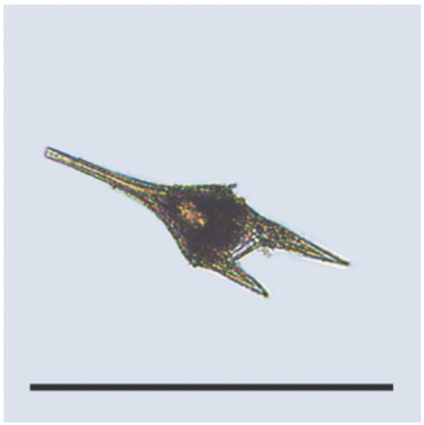
Images of the taxa

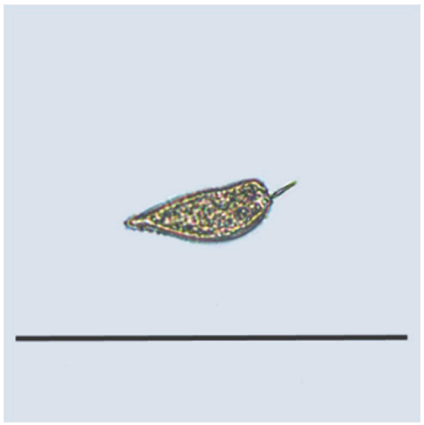
Dinophysis caudata Saville-Kent, 1881



Protoperidinium conicum (Gran) Balech, 1974



Tripos furca (Ehrenberg) F.Gómez, 2013



Prorocentrum gracile F.Schütt, 1895

Scale Bars: 200µm