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by M. I. Roukhiyainen, L. G. Senichkina, and
L. V. Georgiyeva

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Review of the Taxonomic Composition
of the Phytoplankton in the
Central-American Seas

M. I. Roukhiyaynen, L. G. Senichkina,
L. V. Georgiyeva

Notwithstanding the fact that boundaries of
biogeographic areas of the world ocean have been fairly
accurately established, there is still the question of
benthos (6) distribution particularly as it concerns
the Atlantic Ocean. It is much more difficult to define
the ecological-geographic characteristics of plankton
organisms which have broader dynamic areas of distribution.

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One of the main reasons underlying this fact and especially in the case of phytoplankton, is that, apparently, there is a great amount of data on its specific composition and quantitative development in the oceans, but this information is uncoordinated and by far not complete. In this respect, when investigating phytoplankton of Central-American seas, we deemed it useful to compile a total list of species and, whenever possible, present, if only briefly, an ecological-geographic assessment. The list includes not only species (over 500) we recorded through the processing of bathometric and netted samples collected during three trips made by the Soviet-Cuban marine expedition aboard the vessel "Akademic Kovalevskiy" in September-December 1964, but also data obtained from published material. Although this literature may not be exhaustive, it must be presumed that the list includes the main species found in these bodies of water. Species found by T.M. Kondrat'yeva through the processing of bathometric samples collected during a day on station in the coastal zone of Cuba near Havana, were also taken into account (this data is denoted in the list by the figure 66).

The overall list includes about 700 species and varieties belonging to seven types of algae: diatoms (Bacillariophyta), pyrophytic (Pyrophyta), golden

(Chrysophyta), blue-green (Cyanophyta), green (Chlorophyta), euglenoidae (Euglenophyta) and yellow-green (Xanthophyta). The first two types have the greatest variety of species amounting to about 78% of the total number of species and varieties of all algae. Among diatoms, the genus *Chaetocerus* (50) has the greatest varieties of species. The genera *Rhizosolenia* and *Coscinodiscus* are also relatively well provided (19 and 17 species and varieties respectively). Pyrophytic algae consist almost exclusively of peridineans. The greatest number of species (51) was discovered in respect of the genus *Ceratium*. The genera *Peridinium*, *Oxytoxum* and *Gymnodinium* also have a fairly large number of species and varieties (25, 21 and 13 respectively). Moreover, golden algae and coccolithophorids in particular, play an important role in the plankton of Central-American seas. Ninety taxons were recorded among these algae. The greatest number of specimens of this group were found in the genera *Syracosphaera* (14) and *Pontosphaera* (8).

Blue-green algae are represented by 52 taxons including *Oscillatoria*, *Lyngbya* and *Calothrix* which number about 6-8 species. Other genera are represented by single species. Only 13 taxons belong to the other three types of algae.

According to the quoted data it may be seen that the phytoplankton of the Gulf of Mexico is characterized by a great number of genera and species of algae, mostly diatomaceous (68 and 216) with pyrophytic (33 and 162) and golden (30 and 50) in decreasing order of importance. A great variety among these groups (especially diatoms) is also noted in the Caribbean Sea and the Strait of Florida. In the number of taxons, the blue-green algae were found to predominate in the Caribbean Sea. This may be due to the fact that these have been more thoroughly investigated in this body of water. A special study on blue-green algae (38) was taken into account when compiling the list of species for the Caribbean Sea.

The presence of a large number of diatoms in the Gulf of Mexico and the Caribbean Sea is apparently due to a prominently developed shelf zone. The abundance of peridinean plankton and golden algae (especially coccolithophorids) is explained by general biologic laws according to which their importance increases from northern to southern latitudes.

The ecological-geographic characteristics of species are listed according to data provided by major researchers: diatoms - Van Heurck (64), Hustedt (46), Cupp (30); peridineans - Jørgensen (47), Schiller (57),

Kisilev (9); Coccolithophorids and Silicoflages-Gemeinhardt, Schiller (41), Kamptner (48), Glezer (1), Loeblich, Tappan (53); blue-green - Geitler (40), Kosinskaya (12), Proshkina-Lavrenko, Makarova (19). In the case of many types, the information regarding the geographic distribution 18 was supplemented by studies containing lists of species found in plankton mainly in southern seas and the tropical part of the Atlantic (3, 7, 10, 13, 14, 15, 21, 56). Moreover, we used unpublished data contained in the report of L.V. Kuz'menko (1968) on the Arabian Sea. The author is a member of the laboratory of phytoplankton of the Institute of Biochemistry of Southern Seas (InBYuM). We also had access to the dissertation manuscripts of T.M. Kondrat'yeva (1967) and V.V. Denisenko (1967) which they kindly made available to supplement the information on the geographic distribution of species. It must be noted that the list of species for the Adriatic Sea included in the dissertation of V.V. Denisenko (about 700 names), was compiled not only on the basis of personal observations, but the author also considered a wide range of literary sources. Nevertheless, the characteristics were found to be incomplete and not at all identical. In the case of certain species only two or three locations are known. This is especially

true of peridinean algae of which many species were found by Schiller in plankton of the Adriatic Sea. As to their presence at other locations, we found no data to that effect in the literature we used. Therefore, it is often difficult to establish the biogeographical classification of certain species on the basis of material at our disposal. Frequently, the location is given too broadly i.e. "Atlantic Ocean" or "Indian Ocean". This does not make it clear when it must be considered that a certain species is distributed from the Arctic to the Antarctic or is limited to some biogeographic zones. Sometimes in the case of certain species, such as *Heladosphaera aurisinae* Kampt. and *H. corona* (Kampt.) Lec-Schlaud, "Yugoslavia (southern Wales, Istria) are indicated. Does this mean that this is a fresh water species or belongs to the coastal plankton of the northern part of the Adriatic Sea. Such occurrences are frequent to establish with any certitude the geographic distribution of species. Information as to the ecology of different species is also insufficient. Nevertheless, even this data shows that a considerable part of Centricae with their great variety of species belongs foremostly to neritic diatoms and to a lesser degree to oceanic diatoms. Sublittoral species of this group are not

numerous. Pennatic forms are mainly dwellers of the sublittoral. They are less common in neritic plankton and oceanic species are practically non-existent. In peridinean plankton species for which ecological characteristics are available, coastal forms are the most common while oceanic forms are rarer.

Among the main groups of algae (diatoms, peridineans, coccolithophorids), War Water species predominate. Their distribution is limited mostly by tropical and boreal zones. Species known as boreal are less numerous in Central-American Seas. However, as a result of a good water exchange between the latter and various parts of the Atlantic Ocean, they are found relatively frequently. This relationship is particularly evident among peridineans and coccolithophorids. Species with a wide area of distribution i.e. from the tropics to the Arctic, are found fairly frequently among diatom plankton and to a lesser extent in peridinean plankton. As far as the Arctic boreal species are concerned, these are found more rarely than others, a fact which apparently is related to a substantial difference in environmental conditions. Species common to the tropical zone are also not numerous in Central-American Seas.

Blue-green algae mentioned in only one of the published studies on the Caribbean Sea (38), mostly belong to the rooted type and differ substantially from an ecological point of view. Among the latter, many dwell in brackish and fresh waters, hot springs, in humid soil and even on the bark of trees. The number of plankton and marine varieties is small and consists mainly of *Oscillatoria erythraea* (Ehr.) Geitl., *O. Mexicana* Rouch., *O. thiebautii* (Gom.) Geitl. and certain others. Blue-green algae consist mainly of tropical and boreal-tropical dwellers which is also characteristic of Euglenoidae and green algae mentioned in the list. The only variety of yellow-green algae, *Halosphaera viridis* Schmitz., although considered to favour warm currents was found in single specimens in the bodies of water that were investigated whereas in the lower Nearctic sub-zone (as for instance the Barents Sea) it is found in profusion (21).

Thus, notwithstanding that Central-American Seas belong to the tropical zone, the constant exchange of water with the North Atlantic through the Strait of Florida and the continental effect give the plankton flora of these seas a certain boreal character. However, it must be noted that when analyzing available data we

based ourselves on "registering biogeography"* (5). Quantitative factors (typological biogeography) as well as the genesis and origins (historical biogeography) were considered in this particular case only to the extent that these were taken into account in the classification. In connection with the bodies of water that were investigated, the quantitative factors regarding the development of specific species were not analyzed.

Below is a list of plankton algae of the Central-American Seas giving brief ecological-geographical characteristics, the body of water investigated as well as the name of the investigator. The list of species was compiled mainly in a genetic order. Exceptions in the dominant groups are Coccolithophorids, the taxonomy of which has not been sufficiently well studied to the present day. Coccolithophorids and the very scarce groups of green and Euglenoidae algae are listed in alphabetical order.

* Literal translation. Translator's note.

Качественный состав фитопланктона Центрально-Американских морей

6 Группа подгрупп	2 Мексиканский залив				3 Карибское море				4 Флоридский пролив				5 Общее количество			
	7 Количество родов	%	8 Количество видов и разновидностей	%	9 Количество родов	%	10 Количество видов и разновидностей	%	11 Количество родов	%	12 Количество видов и разновидностей	%	13 Количество родов	%	14 Количество видов и разновидностей	%
Bacillariophyta	68	45,9	216	46,5	55	40,4	149	46,0	48	42,5	125	38,9	78	42,2	299	43,5
Pyrophyta	33	22,3	102	31,9	29	21,3	72	22,1	29	25,7	122	38,0	43	23,3	235	31,1
Chrysophyta	30	20,3	65	14,0	26	19,1	52	16,5	26	23,0	60	18,8	33	17,8	90	13,0
Cyanophyta	9	6,1	12	2,6	20	14,7	41	12,5	4	3,5	7	2,2	23	12,4	52	7,5
Chlorophyta	3	2,0	4	0,9	3	2,2	5	1,5	3	2,6	4	1,2	3	1,6	6	0,9
Euglenophyta	4	2,7	4	0,9	2	1,5	4	1,1	2	1,8	2	0,6	4	2,2	6	0,9
Xanthophyta	1	0,7	1	0,2	1	0,8	1	0,3	1	0,9	1	0,3	1	0,5	1	0,1
15 Итого	148	100,0	464	100,0	136	100,0	324	100,0	113	100,0	321	100,0	185	100,0	689	100,0

Центро-Американских морей 17

Legend to Table

1. Quantitative composition of phytoplankton of Central American Seas.
2. Gulf of Mexico.
3. Caribbean Sea.
4. Florida Strait.
5. Total number.
6. Group of algae.
7. Number of genera.
8. Number of species and varieties.
9. Number of genera.
10. Number of species and varieties.
11. Number of genera.
12. Number of species and varieties.
13. Number of genera.
14. Number of species and varieties.
15. Total.

Melosira dubia Ktz. Gulf of Mexico (o.d)* White,
Norwegian, North and Black Seas, Sublittoral;
brackish and sea waters.

M. moniliformis (O. Müll.) Ag. Gulf of Mexico (61),
Florida Strait (66)**. Along coastline of North
America, in Europe, seas of the USSR, Arabian Sea,
tropical zone of the Atlantic, Indian Ocean,
California, Baykal, lake Issyk-Kul', Sublittoral.
Brackish and sea waters.

M. sulcata (Ehr.) Ktz. (*Orthosira marina* W. Sm.) Caribbean
Sea (o.d.). Gulf of Mexico (27, o.d.) Seas of
Western Europe from the Arctic to the Mediterranean
Sea. Pacific and Atlantic. Coastline of North
America. North, Black, Aral, Azov Seas. Sea of
Japan. Southern California. Neritic.

Melosira spp. Caribbean Sea (o.d.). Gulf of Mexico
(34, 35, o.d.).

Hyalodiscus subtilis Bail. Gulf of Mexico (60),
Spitsbergen, Norway, Denmark. Baltic, Okhotsk
Seas. Sea of Japan.

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* O.d. - our data.

** Unpublished data of T.M. Kondrat'yeva.

- Endictya campechiana* Grun. Gulf of Mexico (27).
- Stephanopyxis campechiana* Grun. Gulf of Mexico (27).
- S. palmeriana* (Grev.) Grun. Caribbean Sea (62), Gulf of Mexico (o.d.). Adriatic Sea. Sea of Japan. Often in warm areas of the Pacific (Southern California) and Indian Oceans, Neritic, warm water dweller.
- S. turris* (Grev. et Arn.) Ralfs. Gulf of Mexico (8, o.d.). Florida Strait (8). More often in pelagic and warmer seas. Rarer in North and Far-Eastern Seas. Neritic.
- Stephanopyxis* spp. Gulf of Mexico (o.d.). Florida Strait (o.d.).
- Sceletonema costatum* (Grev.) Cl. Caribbean Sea (62). Gulf of Mexico (8, 37, 61, o.d.). Florida Strait (11, o.d.) Investigated in all the world's seas. Tropical part of the Atlantic Ocean. Neritic.
- Sceletonema* spp. Gulf of Mexico (33, 34, 35).
- Coscinosira floridana* Coop. Gulf of Mexico (29). Northern and Far-Eastern Seas. Neritic.
- C. polychorda* Gran. Caribbean Sea (62). Northern and Far-Eastern Seas. Tropical part of the Atlantic Ocean. California. Neritic.

Thalassiosira Antique (Grun.) Cl. var. septata Pr.-Lavr.

Gulf of Mexico (o.d.). Black Sea. Neritic. Sea water.

Th. decipiens (Grun.) Jörg. Gulf of Mexico (o.d.).

All northern, southern and Far-Eastern Seas. Atlantic Ocean. Neritic.

Th. parva Pr.-Lavr. Gulf of Mexico (50). Florida

Strait (o.d.). Tropical part of the Atlantic Ocean. Arabian, Black, Azov Seas. Neritic. Salt and brackish waters.

Th. subtilis (Ostf.) Gran. Caribbean Sea (62, o.d.).

Gulf of Mexico (8). Florida Strait (8). Northern and tropical part of the Atlantic Ocean. Southern California. Oceanic.

Thalassiosira spp. Caribbean Sea (o.d.). Gulf of Mexico

(o.d.). Florida Strait (11, o.d.).

Cyclotella caspia Grun. Florida Strait (o.d.). Tropical

part of the Atlantic Ocean. Mediterranean, Arabian, Black, Caspian, Aral and Azov Seas. Shira salt water lake. (Khakass. autonomous oblast'). Sublittoral.

C. nana Hust. Gulf of Mexico (61).

C. striata (Ktz.) Grun. Gulf of Mexico (o.d.). Coastline

of Europe. Tropical part of the Atlantic Ocean. Sea of Japan. Sublittoral.

- Cyclotella* spp. Gulf of Mexico (o.d.). Florida Strait
(66, o.d.).
- Ethmodiscus gazellae* (Jan.) Hust. (*E. tympanum* Castr.).
Caribbean Sea (62). Southern Seas. Oceanic.
- Coscinodiscus angustii* Grun. Caribbean Sea (62).
- C. asteromphalus* Ehr. Gulf of Mexico (o.d.). Atlantic
and Pacific coastlines of North America. White,
Chukotsk, Bering, Okhotsk Seas. Sea of Japan and
West European Seas. Oceanic.
- C. commutatus* Grun. (*C. centralis* Ehr.). Caribbean Sea
(62). Northern and Far-Eastern Seas. Marine and
brackish waters.
- C. concinnus* W. Sm. Caribbean Sea (62) Northern and
tropical parts of the Atlantic Ocean. Pacific
shoreline of North America. California. Barents,
Baltic, Kara, Black, Mediterranean and Caspian Seas.
In estuaries of rivers and seas with a low salt
content. Neritic.
- C. curvatulus* Grun. Caribbean Sea (62) Tropical part
of the Atlantic Ocean. European Seas. Neritic.
- C. exentricus* Ehr. Caribbean Sea (62, o.d.) Gulf of
Mexico (o.d.). Arctic, Atlantic and Pacific Oceans.
Barents, Baltic Kara, Bering, Okhotsk, Ionic,
Marmara Caspian and Azov Seas. Sea of Japan.
Oceanic-Neritic.

- C. Gemifer Ehr. var. campechianus Ratt. Gulf of Mexico (27).
- C. gigas Ehr. Caribbean Sea (62). Tropical part of the Atlantic Ocean. Mediterranean, Marmara, Black, Azov and Caspian Seas. Oceanic-neritic. Warm water dweller.
- C. janischii A. Sm. Gulf of Mexico (8, o.d.). Tropical part of the Atlantic Ocean. Mediterranean, Black, Azov and Arabian Seas. Sea of Japan. California. Warm water dweller.
- C. jonesianus (Grev.) Osti. Caribbean Sea (62). Gulf of Mexico (8). Tropical part of the Atlantic Ocean. Black and Azov Seas. Amur liman. Warm water dweller.
- C. lineatus Ehr. Caribbean Sea (62). All oceans. White, Kara, Bering, Okhotsk, Aral, Azov and Adriatic Seas. Sea of Japan. California. Oceanic-neritic.
- C. lineatus Ehr. (?). Gulf of Mexico (8).
- C. marginatus Ehr. var. campechianus Grun. Gulf of Mexico (27). Northern, Far-Eastern and European Seas. Neritic.
- C. nitidus Greg. Caribbean Sea (62). Northern and tropical parts of the Atlantic Ocean. European shorelines. Black and Adriatic Seas. Sea of Japan. California. Neritic.

C. nodulifer A. Sm. Gulf of Mexico (o.d.). All seas.

Tropical part of the Atlantic Ocean.

C. oculus-iridis Ehr. Caribbean Sea (62). Florida Strait

(66). Arctic Ocean, Barents, Kara, Black, Azov, Adriatic, Chukotsk, Okhotsk Seas. Seas of Japan and Europe. Oceanic.

C. perforatus Ehr. var. *pavillardii* (Forti) Hust.

Caribbean Sea (62). Mediterranean, Black and Azov Seas. Tropical part of the Atlantic Ocean. Neritic, marine, warm water dweller.

Coscinodiscus spp. Caribbean Sea (o.d.). Gulf of

Mexico (8, 27, 44, 50, o.d.).

Planktoniella sol (Wall.) Schutt. Caribbean Sea (62).

Gulf of Mexico (8, o.d.). Tropical part of the Atlantic Ocean. Mediterranean, Arabian and Black Seas. Southern California. Oceanic. Warm water dweller.

Planktoniella sp. Gulf of Mexico (o.d.).

Actinoptychus undulatus (Bail.) Ralfs. Gulf of Mexico

(27). Atlantic and Pacific shorelines of America, Barents, Kara, White, Baltic, Mediterranean, Black and Arabian Seas. Neritic.

Actinoptychus spp. Gulf of Mexico (60, o.d.).

Asterolampra marylandica Ehr. Caribbean Sea (62).

Florida Strait (8, 66, o.d.). Tropical part of the Atlantic Ocean. Adriatic, Ionic, Aegian Seas. Oceanic.

A. vanheurckii Grun. Caribbean Sea (62). Tropical part of the Atlantic Ocean. Mediterranean Sea.

Asteromphalus flabellatus (Breb.) Grev. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Tropical part of the Atlantic Ocean. Mediterranean, Arabian and Black Seas. Sea of Japan. Oceanic-neritic (?).

A. heptactis (Breb.) Ralfs. Caribbean Sea (o.c.). Atlantic and Pacific Oceans. Norway and Faroe Islands. Sea of Japan. Black and Adriatic Seas. Oceanic. Dwellers of moderately warm waters.

A. robustus Castr. Florida Strait (o.d.). Arctic Ocean and tropical part of the Atlantic Ocean. Far-Eastern and northern Seas of the USSR. Adriatic, Arabian and Black Seas. Oceanic.

Asteromphalus sp. Florida Strait (8).

Gossieriella tropica Schutt. Caribbean Sea (62).

Shorelines of the Mediterranean and Arabian Seas. Tropical part of the Atlantic Ocean.

Antacodiscus sp. Gulf of Mexico (27).

Eupodiscus argus Ehr. Gulf of Mexico (60). Entire coastline of the North Sea. Marine.

E. radiatus Bail. Gulf of Mexico (60). Rare in Western Europe.

E. rogersii Bail. Gulf of Mexico (60).

Roperia tessellata (Rop.) Grun. Caribbean Sea (62).

Auliscus coelatum Bail. Gulf of Mexico (60). Tropical part of the Atlantic Ocean. Seas of Europe and Japan. Sublittoral.

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A. pruniosus Bail. Gulf of Mexico (60). Coastal areas of Central America. Tropical part of the Atlantic Ocean.

Auliscus sp. Gulf of Mexico (27).

Corethron hystrix Hens. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.). Northern and tropical parts of the Atlantic Ocean. Northern, Far-Eastern Seas. Arabian Sea. Gulf of California. Oceanic.

Corethron sp. Florida Strait (o.d.).

Lauderia borealis Gran. Gulf of Mexico (8). Coastline from the Mediterranean Sea to Northern Norway. Barents Sea. Tropical part of the Atlantic Ocean. California shoreline. Neritic.

L. borealis Gran. (?). Gulf of Mexico. (61).

Detonula confervacea (Cl.). Gran. Florida Strait (o.d.). Southern part of the Norwegian Sea. Coastline of northern Europe. Adriatic and Barents Seas. Oceanic.

Dactyliosolen antarcticus Castr. Caribbean Sea (62).
Gulf of Mexico (8). Florida Strait (o.d.).
European Seas. Southern California. Indian Ocean.
Oceanic. Warm water dwellers.

D. mediterraneus H. Perag. Caribbean Sea (62). Gulf
of Mexico (8, o.d.). Florida Strait (o.d.).
Tropical part of the Atlantic Ocean. Adriatic and
Arabian Seas. Sea of Japan. Southern California.
Gulf of California. Neritic. Also found in the
open sea.

Dactyliosolen spp. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.).

Leptocylindrus danicus Cl. Caribbean Sea (62, o.d.).
Gulf of Mexico (8). Florida Strait (o.d.).
European Seas. Southern California. Indian Ocean.
Oceanic. Warm water dwellers.

D. mediterraneus H. Perag. Caribbean Sea (62). Gulf
of Mexico (8, o.d.). Florida Strait (o.d.). Tropical
part of the Atlantic Ocean. Adriatic and Arabian
Seas. Sea of Japan. Southern California. Gulf
of California. Neritic. Also found in the open
sea.

Dactyliosolen spp. Caribbean Sea (o.d.). Gulf of Mexico
(o.d.).

Leptocylindrus danicus Cl. Caribbean Sea (62, o.d.).

Gulf of Mexico (8, o.d.). Florida Strait (o.d.).

Northern and Far-East Seas. Adriatic, Aegian,

Black Seas. Tropical part of the Atlantic Ocean.

Southern California. Gulf of California. Alaska.

Neritic.

Leptocylindrus spp. Gulf of Mexico (61, o.d.). Florida

Strait (o.d.).

Guinardia flaccida (Gastr.) Perag. Caribbean Sea (62,

o.d.). Gulf of Mexico (8, o.d.). European Seas.

Arabian Sea. Tropical part of the Atlantic Ocean.

Southern California. Gulf of California. Neritic.

Guinardia spp. Gulf of Mexico (34, 35).

Rhizosolenia acuminata (Perag). Gran. Caribbean Sea.

(62). Gulf of Mexico (8, o.d.). Florida Strait

(8). Tropical and sub-tropical parts of the

Atlantic Ocean. Mediterranean and Black Seas.

California. Oceanic. Warm water dwellers.

Rhialata Btw. f. *alata* Btw. Caribbean Sea (o.d.). Gulf

of Mexico (8, o.d.). Florida Strait (66, o.d.).

Pacific, Atlantic, Indian and Arctic Oceans.

Antarctic. Barents, White, and Azov Seas. Far-

Eastern Seas. Off California. Oceanic.

- Rh. *alata* Btw. f. *gracillima* (Cl.) Grun. Gulf of Mexico (8). Tropical part of the Atlantic Ocean. Adriatic and Arabian Seas. Oceanic.
- Rh. *alata* Btw. f. *indica* (Perag.) Ostf. Gulf of Mexico (8, o.d.). Tropical part of the Atlantic Ocean. Mediterranean and Arabian Seas. Southern California. Gulf of California. Oceanic. Warm water dwellers.
- Rh. *bergonii* H. Perag. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (o.d.). Atlantic Ocean. Adriatic and Arabian Seas. Southern California. Gulf of California. Oceanic. Warm water dweller.
- Rh. *calcar-avis* M. Schultze. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8, 66, o.d.). Indian and Pacific (near the California shore) Oceans. Moderate and tropical parts of the Atlantic Ocean. Mediterranean, Arabian, Azov and Caspian Seas. Sea of Japan. Oceanic. Warm water dweller.
- Rh. *castracanei* Perag. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.). Atlantic Ocean. Mediterranean Sea. Southern California Oceanic. Warm water dweller.
- Rh. *cylindrus* Cl. Caribbean Sea (62, o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical part of the Atlantic Ocean. Arabian Sea. Southern California. Neritic.

- Rh. *delicatula* Cl. Caribbean Sea (62). Gulf of Mexico (o.d.). Florida Strait (o.d.). Moderate and tropical part of the Atlantic Ocean. Mediterranean, Arabian, Black, Barents, Baltic, Kara, Okhotsk Seas. Sea of Japan. California. Gulf of California. Neritic. Desalinized areas.
- Rh. *fragilissima* Borg. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.). All northern, southern, Far-Eastern and European Seas from the Arctic Ocean to the Mediterranean Sea. Along the shoreline of California. Neritic.
- Rh. *hebetata* (Bail.) Gran. f. *semispina* (Hens.) Gran. (Rh. *semispina* Hens.). Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8). European Seas of the USSR. Adriatic Sea. Tropical part of the Atlantic Ocean. California. Gulf of California. Oceanic.
- Rh. *imbricata* Btw. var. *shrubsolei* (Cl.) Schrod. Caribbean Sea (62). Gulf of Mexico (8). North European and warm seas. Oceanic.
- Rh. *robusta* Norm. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8). Tropical part of the Atlantic Ocean. English Channel. European Seas. California. Oceanic. Warm water dweller.

- Rh. setigera* Btw. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). European Seas. North European coastline. Tropical part of the Atlantic Ocean. Barents and Arabian Seas. Indian Ocean. California. Gulf of California. Neritic.
- Rh. stolterfothii* H. Perag. Caribbean Sea (62, o.d.). Gulf of Mexico (8, 61, o.d.). Florida Strait (8, o.d.). European coastline. Tropical part of the Atlantic Ocean. Barents, Adriatic, and Arabian Seas. Sea of Japan. Neritic.
- Rh. styliformis* Btw. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (o.d.). Widely distributed in northern, Far-Eastern, Adriatic and Arabian Seas. Indian Ocean. California. Gulf of California. Oceanic.
- Rhizosolenia* spp. Caribbean Sea (o.d.). Gulf of Mexico (8, 27, 34, 35, 44, 50, 61, o.d.). Florida Strait (8, o.d.).
- Bacteriastrum comosum* Pav. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Tropical part of the Atlantic Ocean. Mediterranean and Arabian Seas. Oceanic.
- B. delicatulum* Cl. Caribbean Sea (o.d.). Gulf of Mexico (8, o.d.). Florida Strait (66, o.d.). Northern and tropical parts of the Atlantic Ocean. Eastern

- part of the Pacific Ocean. Mediterranean, Arabian and Black Seas. Oceanic. Warm water dweller.
- B. *elegans* Pav. Gulf of Mexico (o.d.). Mediterranean Sea. Tropical part of the Atlantic Ocean. Pelagic.
- B. *elongatum* Cl. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Northern and tropical parts of the Atlantic Ocean. Adriatic and Arabian Seas. Oceanic. Warm water dweller.
- B. *hyalinum* Laud. var. *hyalinum* Laud. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (o.d.). Northern and tropical parts of the Atlantic Ocean. Central European coastline. Eastern part of the Pacific Ocean. Adriatic, Aegian, Arabian, and Black Seas. Sea of Japan. Neritic. Warm water dweller.
- B. *hyalinum* var. *princeps* (Castr.) Ikari. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Tropical part of the Atlantic Ocean. Mediterranean Sea. Neritic. Warm water dweller.
- B. *mediterraneum* Pav. Gulf of Mexico (o.d.). Mediterranean Sea. Pelagic.
- Bacteriastrum spp. Caribbean Sea (o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.).

- Chaetoceros affinis* Laud. var. *affinis* Laud. f. *affinis*
Laud. subf. *affinis* Laud. Caribbean Sea (62, o.d.).
Gulf of Mexico (8, o.d.). Florida Strait (8, 66,
o.d.). Barents, Caspian, Black, Mediterranean,
Arabian and Azov Seas. Sea of Japan. Tropical
part of the Atlantic Ocean. Neritic.
- Ch. *affinis* Laud. var. *Willei* (Gran.) Hust. Gulf of
Mexico (8). Atlantic Ocean. California coastline.
Mediterranean, Black and Caspian Seas. Neritic.
- Ch. *affinis* Laud. f. *singularis* Kok. subf. *singularis*
Kok. Caribbean Sea (62).
- Ch. *affinis* Laud. f. *singularis* Kok. subf. *ferox* Kok.
Caribbean Sea (62).
- Ch. *anastomosans* Grun. Caribbean Sea (o.d.). Florida
Strait (66). Southern part of North Sea.
Mediterranean and Black Seas. Sea of Japan.
Tropical part of the Atlantic Ocean. Neritic.
- Ch. *atlanticus* Cl. var. *atlanticus* Cl. Caribbean Sea
(62, o.d.). Gulf of Mexico (8, o.d.). Florida
Strait (8, 66). Northern, Far-Eastern, Mediterranean
and Arabian Seas. Southern California. Indian
Ocean. Oceanic.
- Ch. *atlanticus* Cl. var. *neapolitana* (Schröd.) Hust.
Caribbean Sea (62). Mediterranean and Arabian
Seas. California. Oceanic.

- Ch. *brevis* Schutt. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). North, Far-Eastern, Mediterranean and Black Seas. Tropical part of the Atlantic Ocean. Neritic.
- Ch. *coarctatus* Laud. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (8). North Atlantic. Mediterranean and Arabian Seas. California. Oceanic.
- Ch. *compressus* Laud. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (11, o.d.). Widely distributed in the North Sea, Mediterranean, Arabian Sea and Black Sea. Neritic.
- Ch. *constrictus* Gran. Caribbean Sea (o.d.). North, Far-Eastern, Mediterranean, Black Seas. Atlantic Ocean. California. Neritic.
- Ch. *convolutus* Castr. Gulf of Mexico (o.d.). Northern and Far-Eastern Seas. Mediterranean and Black Seas. Tropical part of the Atlantic Ocean. California. Oceanic.
- Ch. *curvisetus* Cl. Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.). Northern and tropical parts of the Atlantic Ocean. Barents, Baltic, Mediterranean, Arabian, Azov Seas. California coastline. Neritic.
- Ch. *dadayi* Pav. Caribbean Sea (62). Tropical part of the Atlantic Ocean. Mediterranean Sea. Southern California. Oceanic.

- Ch. *danicus* Cl. Caribbean Sea (o.d.). Florida Strait (66). Mediterranean and Arabian Seas. Southern California. Seas of the USSR, more or less desalinized. Neritic.
- Ch. *decipiens* Cl. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (66). Widely distributed. Arctic Ocean, northern and tropical parts of the Atlantic Ocean. Indian Ocean. Barents, Baltic, Azov, Mediterranean, Arabian and Black Seas. Sea of Japan. Southern California. Oceanic.
- Ch. *debilis* Cl. Gulf of Mexico (o.d.). Northern and tropical part of the Atlantic Ocean. Northern, Far-Eastern Seas. Black Sea. California. Neritic.
- Ch. *delicatulus* Ostf. Gulf of Mexico (o.d.). Mediterranean, Caspian, Aral Seas. Salt water lakes of Europe and Asia.
- Ch. *densus* Cl. Gulf of Mexico (o.d.). Atlantic and Pacific coastlines of North America. Barents, Bering, Mediterranean and Black Seas. Sea of Japan. Oceanic-neritic.
- Ch. *dichaeta* Ehr. Gulf of Mexico (o.d.). Florida Strait (o.d.). Atlantic Ocean. Southern California. Indian Ocean. Oceanic.

- Ch. *didymus* Ehr. var. *didymus* Ehr. Caribbean Sea
(62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait. Atlantic Ocean. European and Far-Eastern Seas. California. Neritic. 25
- Ch. *didymus* Ehr. var. *anglica* (Grun.) Gran. Caribbean Sea (62). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical part of the Atlantic Ocean. Tyrrhenian, Adriatic and Far-Eastern Seas. California. Neritic.
- Ch. *didymus* Ehr. var. *protuberans* (Laud.) Gran et Yendo. Gulf of Mexico (8, o.d.). Tropical part of the Atlantic Ocean. Tyrrhenian and Adriatic Seas. Rarer in Far-Eastern Seas. Neritic (?). Warm water dwellers.
- Ch. *difficilis* Cl. Gulf of Mexico (o.d.). Florida Strait (o.d.). North Arabian, tropics, Atlantic, California. Neritic.
- Ch. *diversus* Cl. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8). European coastlines. Mediterranean, Arabian, Black Seas. Sea of Japan. Southern California. Neritic.
- Ch. *dubius* Pr.-Lavr. Florida Strait (66). Black and Azov Seas. Neritic.
- Ch. *fragilis* Meun. Gulf of Mexico (o.d.). North and Mediterranean Seas. Neritic.

- Ch. *indicus*. Karst. Caribbean Sea (62).
- Ch. *lacinosus* Schütt. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (66). Pacific coastline of North America. Atlantic Ocean. North, Mediterranean and Caspian Seas. Sea of Japan. California. Neritic.
- Ch. *laevis* Leud.-Fort. Caribbean Sea (62). Gulf of Mexico (o.d.). California. Rare. Neritic.
- Ch. *lauderi* Ralfs. Florida Strait (66). North, Baltic, Mediterranean, Arabian and Azov Seas. Tropical Atlantic. Neritic.
- Ch. *lorenzianus* Grun. var. *lorenzianus* Grun. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). European coastline. North, Mediterranean and Black Seas. Sea of Japan. Tropical Atlantic. California. Neritic.
- Ch. *lorenzianus* Grun. var. *singularis* Tok. Gulf of Mexico (8).
- Ch. *messanensis* Castr. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (66). European coastline. Tropical Atlantic. Mediterranean and Arabian Seas. Sea of Japan. Southern California. Oceanic.
- Ch. *pelagicus* Cl. Gulf of Mexico (8, o.d.). Sea of Japan and Black Sea. Californian. Neritic, warm water dweller.

- Ch. *pendulus* Karst. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.). Tropical Atlantic. Mediterranean and Arabian Seas. Oceanic.
- Ch. *peruvianus* Btw. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean, Arabian, Black and Azov Seas. Southern California. Oceanic-neritic.
- Ch. *pseudocurvisetus* Mang. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic, Tyrrhenian and Black Seas. Southern California. Neritic.
- Ch. *radicans* Schütt. Caribbean Sea (62). North, Far-Eastern and Mediterranean Seas. Tropical Atlantic. California coastline. Neritic.
- Ch. *rostratus* Laud. Caribbean Sea (62). Atlantic Ocean. Mediterranean Sea. Warm water dweller.
- Ch. *seychellarum* Karst. Caribbean Sea (62).
- Ch. *similis* Cl. Gulf of Mexico (8). North Atlantic. West European coastline. Baltic and Barents Seas. Sea of Japan. California. Neritic.
- Ch. *socialis* Laud. Gulf of Mexico (8). Arctic Ocean. Northern and tropical parts of the Atlantic Ocean. Baltic, Barents, Mediterranean, Aral, Azov, Black, Caspian and Okhotsk Seas. Sea of Japan. California. Neritic.

Ch. subsecundus (Grun.) Hust. Gulf of Mexico (8, o.d.).
Arctic Ocean. Tropical Atlantic. North, Far-
Eastern, Mediterranean and Black Seas. California
shoreline. Neritic.

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Ch. sub tilis Cl. Gulf of Mexico (o.d.). Barents,
Kara, White, Baltic, Black, Caspian, Azov and
Aral Seas. Tropical Atlantic. Neritic.

Ch. tetrastichon Cl. Caribbean Sea (62). Tropical
Atlantic. Mediterranean Sea. Oceanic.

Ch. tortissimus Gran. Caribbean Sea (62). Tropical
Atlantic. North, Norwegian and Mediterranean
Seas. Neritic.

Ch. vanheurcki Gran. Caribbean Sea (62). Tropical
Atlantic. Far-East. California. Neritic. Warm
water dweller.

Ch. Wighami Btw. Gulf of Mexico (o.d.). North Atlantic.
North, Baltic, Mediterranean, Black, Caspian, Aral
and Azov Seas. California. Issyk-Kul'. Salt
water lakes of the Kazakh, Uzbek, Turkmen and
Ukrainian SSSR. West Siberia. Neritic.

Chaetoceros spp. Caribbean Sea (o.d.). Gulf of Mexico
(8, 34, 35, 50, 61). Florida Strait (8, o.d.).

Eucampia cornuta (Cl.) Grun. Caribbean Sea (62). Gulf
of Mexico (o.d.). Florida Strait (o.d.). Atlantic
Ocean. Southern California. Neritic.

Eucampia sp. Gulf of Mexico (8).

Climacodium biconcavum Cl. Caribbean Sea (62). Atlantic Ocean. Tropical and Sub-tropical Seas of Asia and Australia. Oceanic. Warm water dweller.

Cl. frauenfeldianum Grun. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.). Northern and tropical parts of the Atlantic Ocean. Ionian, Arabian Seas. California. Oceanic.

Climacodium spp. Caribbean Sea (o.d.).

Streptotheca thamensis Schrub. Caribbean Sea (62). Gulf of Mexico (8). Southern part of the North Sea. Atlantic seaboard of France. California and Alaska. Neritic.

Ditylum brightwellii (West.) Grun. Caribbean Sea (62). Gulf of Mexico (o.d.). Florida Strait (o.d.). North, Bering, Okhotsk, Azov, Mediterranean and Arabian Seas. Sea of Japan. California shoreline. Tropical Atlantic. Neritic.

D. sol. Grun. Caribbean Sea (62). Tropical Atlantic.

Lithodesmium undulatum Ehr. Gulf of Mexico (8).

Inshore from southern part of the North Sea to the Mediterranean Sea. Tropical Atlantic. Southern California. Gulf of California. Neritic.

Lithodesmium sp. Gulf of Mexico (27).

Triceratium balearicum Cl. et Grun. Florida Strait (66).

Littoral of warm seas. Sublittoral.

- T. campechianum* Grun. Gulf of Mexico (27). Sublittoral.
- T. favus* Ehr. Gulf of Mexico (60). Widely distributed along shores of all European Seas, tropical part of the Atlantic. Sublittoral. Plankton.
- T. firmum* Grev. Gulf of Mexico (60).
- Hydrosira triquetra* Wall. Gulf of Mexico (27). Tropical Atlantic.
- Biddulphia alternans* (Bail.). V.H. Caribbean Sea (o.d.). Antwerp, Ireland, England. Tropical Atlantic. Neritic.
- B. aurita* (Lyng.) Breb. et Godey. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Black Sea. Tropical Atlantic. Northern and Far-Eastern Seas of the USSR. Sublittoral.
- B. dubia* (Btw.) Cl. Gulf of Mexico (8). Tropical Atlantic. Southern California. Neritic. Warm water dweller.
- B. mobiliensis* Bail. Gulf of Mexico (o.d.). All European Seas. Tropical Atlantic. California. Neritic.
- B. pentacrinus* (Ehr.) Boyer. Gulf of Mexico (27). Near European shores in moderate latitudes. Far-Eastern seas. Adriatic and Black Seas. Tropical Atlantic. Neritic (?). Warm water dweller.

- B. pulchella* Gray. Gulf of Mexico (27). Along European shores in moderate latitudes. Far-Eastern Seas. Adriatic and Black Sea. Tropical Atlantic. Neritic (?). Warm water dweller.
- B. rhombus* (Ehr.) W. Sm. Gulf of Mexico (27). Northern Seas of the USSR. Along shores of all European Seas. Tropical Atlantic. Rarely found in California. Neritic. Warm water dweller.
- B. sinensis* Grev. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (8). Coastal part of the North Sea to southern Norway. Tropical Seas. Tropical Atlantic. In estuaries of German rivers. Pelagic.
- Biddulphia* spp. Gulf of Mexico (27, o.d.). Florida Strait (66, o.d.).
- Cerataulina bergonii* H. Perag. Caribbean Sea (o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8, 66, o.d.). From the North Sea to the Mediterranean. California. Norwegian, Barents, Baltic, Okhotsk, Arabian and Azov Seas. Sea of Japan. Tropical Atlantic. Alaska. Neritic.
- C. pelagica* (Cl.). Hendeby. Caribbean Sea (62). Tropical Atlantic.
- Hemiaulus hauckii* Grun. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.).

Tropical Atlantic. Mediterranean, Arabian, Black and Azov Seas. Sea of Japan. Near the coast of California. Neritic.

H. membranaceus Cl. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.).

Tropical Atlantic. Tropical part of the Pacific Ocean. Arabian Sea. Oceanic.

H. chinensis Grev. (*H. sinensis* (Grev.) De Toni).

Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.). Mediterranean and Arabian Seas. Southern California. Neritic. Warm water dweller.

Hemiaulus spp. Gulf of Mexico (61, o.d.)

Hemidiscus sp. Gulf of Mexico (27).

Isthmia capensis Grun. Gulf of Mexico (27). Sublittoral.

I. enervis Laud. Caribbean Sea (62). Widely distributed along the coastlines of England, France and Finland. Tropical Atlantic. Sublittoral.

I. nervosa Ktz. Florida Strait (66). North European and Far-Eastern Seas. Sublittoral.

Terpsinoë americana (Bail) Rafs. Gulf of Mexico (27). Rare in Europe. Tropical Atlantic. Dweller of brackish waters.

T. musica Ehr. Gulf of Mexico (27, 60). Found in fresh and brackish waters. Coastline of warm seas. Tropical Atlantic. Neritic. Warm water dweller.

- Campilosira cymbelliformis* (A. Sm.) Grun. Caribbean Sea (o.d.). North Sea. Pacific coastline of North America. Southern California. Tropical Atlantic. Sublittoral.
- Cymatosira lorenziana* Grun. Gulf of Mexico (o.d.). Mediterranean coastline. Sublittoral.
- Cymatosira* sp. Gulf of Mexico (o.d.).
- Dimerogramma* sp. Gulf of Mexico (27).
- Glyphodesmis campechiana* Boyer. Gulf of Mexico (27).
- Podocystis spathulata* (Shadb.) V.H. Caribbean Sea (o.d.).
- Rhaphoneis surirella* (Ehr.) Grun. Gulf of Mexico (27). European coastline. Atlantic coast of Western Europe. Rare in the Mediterranean Sea.
- Rhaphoneis* sp. Caribbean Sea (o.d.).
- Rhabdonema adriaticum* Ktz. Caribbean Sea (o.d.). Florida Strait (66). Mostly in warm or moderately warm seas. Rare in the north. Tropical Atlantic. Sublittoral.
- Rhabdonema* spp. Gulf of Mexico (8, 33).
- Striatella delicatula* (Ktz.) Grun. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (11). Widely distributed in Spring and Autumn. Tropical Atlantic. Black and Azov Seas. Sublittoral.

S. unipunctata (Lyngb.) Ag. Florida Strait (66).

Near coastlines of Europe and North America.

Barents, Black, Arabian, Marmora and Azov Seas.

Sea of Japan. Sivash. Tropical Atlantic. Sublittoral.

Marine.

Striatella spp. Gulf of Mexico (32). Florida Strait
(66).

Tabellaria spp. Caribbean Sea (o.d.). Gulf of Mexico
(8).

Grammatophora angulosa Ehr. Caribbean Sea (o.d.). Gulf
of Mexico (o.d.). Along entire European coastline
especially in northern Europe. Mediterranean and
Black Seas. Sublittoral.

G. macilenta W. Sm. Gulf of Mexico (60).

G. marina (Lyngb.) Ktz. var. *marina* (Lyngb.) Ktz.

Caribbean Sea (o.d.). Gulf of Mexico (27).

Florida Strait (66, o.d.). Atlantic and Pacific
coastlines of North America. Tropical Atlantic.

Mediterranean, Arabian, Black, White, Aral, Azov
and Caspian Seas. Sea of Japan. Sublittoral.

G. marina (Lyngb.) Ktz. var. *adriatica* Grun. Florida
Strait (66). Widely distributed. In all seas of
the USSR. Sublittoral.

G. oceanica (Ehr.) Grun. Caribbean Sea (o.d.). Florida
Strait (o.d.). Distributed along all coastlines.
Occasionally found in plankton. Sublittoral.

- Grammatophora spp. Gulf of Mexico (27, 34, 35).
- Licmophora clevei Mer. Florida Strait (66). Sublittoral.
- L. ehrenbergii (Ktz.) Grun. Caribbean Sea (o.d.).
Florida Strait (11, o.d.). Widely distributed.
Found in All European Seas. Atlantic coastline
of North America. Mediterranean and Black Seas.
Sublittoral.
- L. gracilis (Ehr.) Grun. Caribbean Sea (o.d.). Coastlines
of all European Seas. Atlantic coastline of North
America. Kamchatka coastline. Sea of Japan.
Sublittoral.
- L. grunowii Mer. Florida Strait (66). Sublittoral.
- L. hastata Mer. Florida Strait (11). European coastline.
Black Sea. Sublittoral.
- L. hyalina (Ktz.) Grun. Florida Strait (66). All
European coastlines. Sublittoral.
- L. flabellata (Carm.) Agardh. Gulf of Mexico (o.d.).
Widely distributed in temperate and southern seas.
Tropical Atlantic. Sublittoral.
- Licmophora spp. Caribbean Sea (o.d.). Gulf of Mexico
(o.d.). Florida Strait (66).
- Diatoma spp. Caribbean Sea (o.d.). Gulf of Mexico
(o.d.). Florida Strait (66).
- Plagiogramma campechiana. Gulf of Mexico (27).

P. stauroptera Grev. Gulf of Mexico (60).

P. vanheurekii Grun. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Widely distributed. Northern and temperate seas of Europe. Southern California. Tropical Atlantic. Sublittoral. Found occasionally in plankton.

Plagiogramma sp. Gulf of Mexico (o.d.).

Fragillaria spp. Gulf of Mexico (o.d.). Florida Strait (o.d.).

Synedra crystallina (Ag.) Ktz. Gulf of Mexico (60). Widely distributed. Northern and European Seas. Sivash. Black and Azov Seas. Tropical Atlantic. Sublittoral. Euryhaline.

S. gaillonii (Bory) Ehr. Gulf of Mexico (o.d.). Florida Strait (o.d.). Among marine vegetation of the North Sea. Sea of Japan. Black Sea. Tropical Atlantic. Sublittoral. Found in salt and brackish waters.

S. undulata Bail. Florida Strait (66). Along coastlines of North America. California. Marmora, Black and Mediterranean Seas. Sublittoral. Marine.

Synedra spp. Caribbean Sea (o.d.). Gulf of Mexico (27, o.d.). Florida Strait (11, o.d.).

Thalassionema nitzchioides Grun. Caribbean Sea (62, o.d.). Gulf of Mexico (8, 61, o.d.). Florida Strait (8, 11, o.d.). Southern California. Barents, Mediterranean, Arabian, Black and Azov Seas. Tropical Atlantic. Indian Ocean. Neritic. Euryhaline, eurythermal. Found in temperate to cold waters.

Thalassiothrix delicatula Cupp. Caribbean Sea (62). Gulf of Mexico (8, o.d.). Florida Strait (o.d.). Found in southern-temperate to subtropical waters.

The frauenfeldii Grun. Caribbean Sea (62, o.d.). Gulf of Mexico (8, o.d.). Florida Strait (8, 11, o.d.). Southern-temperate waters. Widely distributed. Barents, Mediterranean, Arabian and Black Seas. Tropical Atlantic. Oceanic.

Th. longissima Cl. et Grun. Florida Strait (66). Northern and Far-Eastern Seas of the USSR. North and tropical Atlantic. Adriatic, Arabian and Black Seas. Oceanic.

Th. mediterranea Pav. var. *pacifica* Cupp. Caribbean Sea (o.d.). Gulf of Mexico (8, o.d.). Florida Strait (66). Southern California. Arabian Sea. Pelagic. Temperate to southern temperate waters.

Thalassiothrix spp. Caribbean Sea (o.d.). Gulf of Mexico (35, o.d.). Florida Strait (o.d.).

Asterionella japonica Cl. Caribbean Sea (o.d.). Gulf of Mexico (8, 61, o.d.). Florida Strait (66, o.d.). Widely distributed in seas and brackish waters in estuaries of rivers of northern Europe. Far-Eastern, Adriatic and Arabian Seas. Tropical Atlantic. Neritic.

A. Kariana Grun. Florida Strait (o.d.). Northern coastline of Europe. Neritic.

A. notata Grun. Caribbean Sea (o.d.). Coastal. In plankton of southern and northern seas. Atlantic Ocean. Mediterranean Sea.

Asterionella sp. Florida Strait (66).

Pseudoeunotia doliolus (Wall.) Grun. Florida Strait (66). Warm seas (Mediterranean, Arabian). Tropical Atlantic. Neritic. Littoral.

Cocconeis campechiana Cl. Gulf of Mexico (27). Sublittoral.

C. scutellum Ehr. Caribbean Sea (o.d.). Widely distributed. Coastline of the North Sea. Black and Arabian Seas. Sublittoral.

Cocconeis sp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66).

Achnanthes longipes Ag. Caribbean Sea (o.d.). Florida Strait (66). Coastline of Western Europe. Tropical Atlantic. Caspian, Black, and Azov Seas. Sivash. Sublittoral.

- Achnanthes* sp. Gulf of Mexico (o.d.).
- Mastogloia capitata* (Brun) Cl. Florida Strait (o.d.).
Indian Ocean. Honduras. Pelagic.
- M. graciloides* Hust. Florida Strait (66). Borneo
and Seychelle Islands.
- M. rostrata* (Wall.) Hust. (*Stigmaphora rostrata* Wall.).
Caribbean Sea (o.d.). Gulf of Mexico (o.d.).
Florida Strait (66, o.d.). Indian Ocean. Tropical
Atlantic. Pelagic.
- Mastogloia* spp. Gulf of Mexico (o.d.). Florida Strait
(o.d.).
- Diploneis crabro* (Ktz) Cl. Caribbean Sea (o.d.). Black
Sea. Sublittoral.
- D. interrupta* (Ktz.) Cl. Gulf of Mexico (o.d.). Florida
Strait (66). Brackish waters. Along coastline of
northern seas. Sublittoral.
- Diploneis* spp. Caribbean Sea (o.d.). Gulf of Mexico
(o.d.). Florida Strait (66, o.d.).
- Stauroneis aspera* Ehr. Gulf of Mexico (60). Black Sea.
- Navicula apiculata* Breb. Gulf of Mexico (60).
- N. campechiana* Grun. Gulf of Mexico (27).
- N. didyma* (Ehr.) Ktz. Gulf of Mexico (60). Common to
all of Europe. Southern coastline of North Sea.
Tropical Atlantic.

- N. distans* (W. Sm.) V.H. Gulf of Mexico (o.d.). Shoreline of Western Europe. Greenland. Spitsbergen. Norway. North, Black and Far-Eastern Seas. Tropical Atlantic. Sublittoral. Rarely found in plankton.
- N. interrupta* Bail. Gulf of Mexico (60). North Sea coastline.
- N. lyra* Ehr. Caribbean Sea (o.d.). Gulf of Mexico (60, o.d.). Widely distributed from the Arctic to the Mediterranean and Azov Seas. Tropical Atlantic. Euryhaline.
- N. membranacea* Cl. Caribbean Sea (62). Along shorelines of England, Holland, Belgium, Sweden. North and Arabian Seas. Neritic.
- N. peregrina* (Ehr.) Ktz. Florida Strait (66). Continental bodies of water. Baltic and North Seas. Brackish water dweller.
- N. permagna* (Bail.). Edw. Gulf of Mexico (60).
- N. punctulata* W. Sm. (*N. marina* Ralfs). Gulf of Mexico (60). Aral, Caspian, North and Far-Eastern Seas. Brackish and salt water.
- N. rombicula* Hust. Florida Strait (o.d.).
- Navicula* spp. Caribbean Sea (o.d.). Gulf of Mexico (8, 27, 34, 35, 50). Florida Strait (11, o.d.).
- Pinnularia* spp. Gulf of Mexico (o.d.).

Gyrosigma litorale W. Sm. Florida Strait (66). West European coastline. North Sea and Mediterranean. English Channel. Sivash. Sublittoral.

Pleurosigma balticum W. Sm. Gulf of Mexico (60). Southern coastline of the North Sea, Black Sea. Marine.

P. elongatum W. Sm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66). Widely distributed in the USSR. Northern and southern seas. Continental bodies of water. Tropical Atlantic. Sublittoral. Marine and brackish waters.

P. normanii Ralfs. Caribbean Sea (o.d.). Arctic. Barents, North, Mediterranean and Black Seas. Along shorelines of Western Europe. Sumatra. Tropical Atlantic. Marine.

P. pelagicum Perag. Caribbean Sea (62).

Pleurosigma ssp. Caribbean Sea (62, o.d.). Gulf of Mexico (8, 33, 34, 35, o.d.). Florida Strait (66, o.d.).

Amphiprora longa Cl. or *A. lepidoptera* Grev. Gulf of Mexico (60).

Amphiprora spp. Caribbean Sea (o.d.). Florida Strait (66, o.d.).

Gyrosigma litorale W. Sm. Florida Strait (66). West European coastline. North Sea and Mediterranean. English Channel. Sivash. Sublittoral.

Pleurosigma balticum W. Sm. Gulf of Mexico (60). Southern coastline of the North Sea, Black Sea. Marine.

P. elongatum W. Sm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66). Widely distributed in the USSR. Northern and southern seas. Continental bodies of water. Tropical Atlantic. Sublittoral. Marine and brackish waters.

P. normanii Ralfs. Caribbean Sea (o.d.). Arctic. Barents, North, Mediterranean and Black Seas. Along shorelines of Western Europe. Sumatra. Tropical Atlantic. Marine.

P. pelagicum Perag. Caribbean Sea (62).

Pleurosigma ssp. Caribbean Sea (62, o.d.). Gulf of Mexico (8, 33, 34, 35, o.d.). Florida Strait (66, o.d.).

Amphiprora longa Cl. or *A. lepidoptera* Grev. Gulf of Mexico (60).

Amphiprora spp. Caribbean Sea (o.d.). Florida Strait (66, o.d.).

Amphora coffeiformis (Ag.) Ktz. Florida Strait (66).

Widely distributed. Tropical Atlantic. Mediterranean, Black and Caspian Seas. Bodies of water of Staraya Russa (Old Russia). Karelian ASSR. Salt and brackish waters.

A. crassa Greg. var. *campechiana* Grun. Gulf of Mexico (27).

A. grevilleana Greg. var. *campechiana* Grun. Gulf of Mexico (27).

A. hyalina Ktz. Gulf of Mexico (o.d.). Florida Strait (11, o.d.). Atlantic coastline of North America. Western Europe. Spitsbergen. Baltic, North, Mediterranean, Arabian and Black Seas. Sublittoral.

Amphora spp. Caribbean Sea (o.d.). Gulf of Mexico (27, o.d.). Florida Strait (66, o.d.).

Cymbella spp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.).

Bacillaria paradoya Gm. Caribbean Sea (o.d.). Florida Strait (66, o.d.). Baltic, Barents, White, Kara, Bering, Aral, Azov, Caspian, Black and Adriatic Seas. Tropical Atlantic. Amur lagoon (liman). Neritic. Euryhaline.

B. paradoxa Gm. (?). Gulf of Mexico (27).

Nitzschia brightwellii Kitton. Gulf of Mexico (60).

N. campechiana Grun. Gulf of Mexico (27).

- N. closterium* (Ehr.) W. Sm. Caribbean Sea (o.d.).
Gulf of Mexico (8, o.d.). Florida Strait (11,
o.d.). Widely distributed. Shallow waters of
northern and Far-Eastern Seas. Tropical Atlantic.
Black, Azov, Aral, Caspian, Adriatic. Ionian
Aegian and Arabian Seas. Issyk-Kul'. Brackish
bodies of water of Staraya Russa. Tychopelagic,
euryhaline.
- N. cocconeiformis* Grun. Gulf of Mexico (27).
- N. delicatula* Grun. Gulf of Mexico (o.d.).
- N. longissima* (Breb.) Ralfs. Caribbean Sea (62). Gulf
of Mexico (8, o.d.). Florida Strait (8, 11, o.d.).
Barents, Bering, White, Adriatic, Ionian, Arabian,
and Black Seas. Sea of Japan. Bosphorus. Amur
lagoon (liman). Atlantic and Pacific coasts of
North America. Sublittoral.
- N. lorenziana* Grun. Florida Strait (66). Iss-Kul'.
Kerch Strait. Black, Mediterranean and North
Seas. Sea of Japan. Tropical Atlantic. Brackish
waters.
- N. pacifica* Cupp. Gulf of Mexico (o.d.). Arabian Sea.
Temperate bodies of water. Neritic, possibly
oceanic.
- N. punctata* (W. Sm.) Grun. Gulf of Mexico (60).
Mediterranean, Black and Azov Seas. Tropical
Atlantic. Brackish waters. Coastal areas.

- N. pungens* Grun. var. *pungens* Grun. Gulf of Mexico
(o.d.). Black Sea.
- N. pungens* Grun. var. *Atlantica* Cl. Gulf of Mexico
(o.d.). Florida Strait (66). Southern California.
Adriatic Sea, Tropical Atlantic. Neritic.
- N. seriata* Cl. Caribbean Sea (62, o.d.). Gulf of
Mexico (8, o.d.). Florida Strait (o.d.). Barents
Sea. Tropical Atlantic. Mediterranean and Black
Seas. Indian Ocean. Neritic. Oceanic.
- N. tenuirostris* Mer. Caribbean Sea (o.d.). Gulf of
Mexico (8, o.d.). Florida Strait (8, 11, o.d.).
Shallow waters of northern and Far-Eastern Seas.
Aral, Black, Azov, Caspian, Mediterranean and
Arabian Seas. Tropical Atlantic. Issyk-Kul'.
Found in brackish waters. Tychopelagic.
- Nitzschia* spp. Caribbean Sea (o.d.). Gulf of Mexico
(8, 34, 35, 50, 61, o.d.). Florida Strait (8, 66,
o.d.).
- Pseudonitzschia delicatissima* (Cl.) Heid. (*Nitzschia*
delicatissima Cl.). Caribbean Sea (62). Gulf of
Mexico (8, o.d.). Florida Strait (11, o.d.).
Widely distributed. Barents, Mediterranean and
Black Seas. Neritic.
- Surirella campechiana* Hust. Gulf of Mexico (27).

- S. fastuosa* Ehr. var. *recedens* (A.S.) Cl. Gulf of Mexico (8). Widely distributed. Seas of the USSR. West European shorelines. Marine.
- S. gemma* Ehr. var. *gemma* Ehr. Caribbean Sea (o.d.). Arctic and Far-Eastern Seas. Black Sea. Estuaries of rivers. Sublittoral. Found in salt and brackish waters.
- S. gemma* Ehr. var. *reniformis* (Grun.) Pr.-Lavr. (*S. reniformis* Grun.). Gulf of Mexico (27). Common in coastal plankton. Sublittoral. Marine.
- Surirella* spp. Gulf of Mexico (50, o.d.). Florida Strait (66).
- Campylodiscus campechianus* Deby. Gulf of Mexico (27).
- C. echeneis* Ehr. (*C. argus* (Bail.) W. Sm.) Gulf of Mexico (60). Widely distributed in the USSR. Found in brackish waters.
- C. erebrosus* W. Sm. Gulf of Mexico (60).
- Campylodiscus* sp. Gulf of Mexico (27).

PYRROPHYTA

Peridinae (dinoflagellatae)

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- Exuviaella apora* Schill. Gulf of Mexico (o.d.). Tropical Atlantic. Plymouth. Mediterranean, Arabian and Black Seas.

- E. compressa* Ostf. Gulf of Mexico (o.d.). Florida Strait (66, o.d.). Atlantic Ocean. Mediterranean, Arabian and Black Seas. Sea of Japan.
- E. cordata* Ostf. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (11, o.d.). Tropical Atlantic. Mediterranean, Arabian, Black, Azov and Caspian Seas. Neritic.
- E. marina* Cienk. Caribbean Sea (o.d.). Florida Strait (11, o.d.). Tropical Atlantic. Mediterranean, Arabian, Black, Azov, and Barents Seas. Neritic.
- E. Perforata* Gran. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Adriatic, Black, North and Baltic Seas. Neritic-oceanic.
- E. pusilla* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic, Ionian, Aegian, Arabian, Black and Azov Seas.
- E. pyriformis* Schill. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic Sea (especially in coastal waters).
- Exuviaella* spp. Caribbean Sea (o.d.). Gulf of Mexico (8, 34, 35, o.d.). Florida Strait (66, o.d.).
- Porella globulus* Schill. Caribbean Sea (o.d.). Tropical Atlantic. Adriatic and Arabian Seas.

Porella sp. Caribbean Sea (o.d.).

Prorocentrum adriaticum Schill. Gulf of Mexico (o.d.).

Tropical Atlantic. Adriatic Sea.

P. leboure Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Tropical Atlantic. Mediterranean Sea.

P. maximum Schill. Caribbean Sea (o.d.). Adriatic and Arabian Seas.

P. rostratum Stein. Florida Strait (66). Atlantic Ocean. Mediterranean and Arabian Seas.

P. schilleri Böhm. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic Sea.

Prorocentrum spp. Caribbean Sea (o.d.). Gulf of Mexico (33, 34, 35).

Palaeophalacroma uncinatum Schill. Caribbean Sea (o.d.). Florida Strait (o.d.). Atlantic Ocean. Adriatic Sea.

Pseudophalacroma nasutum (Stein) Jörg. Caribbean Sea (o.d.). Florida Strait (o.d.). Atlantic Ocean. Norwegian coastline. Mediterranean Sea.

Phalacroma cuneus Schutt. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (8, o.d.). Tropical Atlantic. Adriatic Sea.

Ph. lativelatum Kof. et Skgsb. Gulf of Mexico (o.d.). Eastern coastline of the tropical part of the Pacific Ocean.

Ph. lens Kof. et Skgsb. Caribbean Sea (o.d.). Eastern coastline of the tropical part of the Pacific Ocean.

Ph. pulchellum Leb. Caribbean Sea (o.d.). Florida Strait (o.d.). Tropical Atlantic. Plymouth. Mediterranean, Black and Azov Seas.

Ph. rotundatum (Clap. et Lachm.) Kof. et Mich. Florida Strait (o.d.). Tropical Atlantic. All European Seas. Mediterranean, Arabian, Black, Barents and Baltic Seas. Oceanic.

Ph. sphaeroideum Schill. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic, Arabian and Black Seas.

Phalacroma spp. Caribbean Sea (o.d.). Gulf of Mexico (8, o.d.). Florida Strait (o.d.).

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Dinophysis caudata Sav.-Kent. Gulf of Mexico (8, 42, o.d.). Widely distributed in warm seas. Tropical Atlantic.

D. diegensis Kof. Caribbean Sea (o.d.). All tropical and sub-tropical seas. Tropical Atlantic. Pacific Ocean. California coastline.

D. exiqua Kof. et Skgsb. Florida Strait (o.d.). Tropical Atlantic. Eastern shoreline of the tropical part of the Pacific Ocean.

D. parva Schill. Caribbean Sea (o.d.). Adriatic Sea.

D. schuttii Murr. et Whitt. Florida Strait (o.d.).

All tropical and sub-tropical Seas. Tropical Atlantic.

D. tripos Gourr. Gulf of Mexico (34, 35). Antlantic Ocean. Carried by Gulf Stream to Norway and Greenland. Mediterranean and Black Seas. Sea of Japan. Warm water dweller.

Dinophysis spp. Caribbean Sea (o.d.). Gulf of Mexico (8, 34, 35).

Amphisotenia elongata Kof. et Skgsb. Gulf of Mexico (o.d.). Tropical and sub-tropical areas of the eastern part of the Pacific Ocean. Tropical Atlantic.

A. globifera Stein. Gulf of Mexico (8). Widely distributed in tropical and sub-tropical waters.

A. lemmermanni Koj. Florida Strait (o.d.). Tropical and sub-tropical parts of the Pacific Ocean.

Amphisolenia spp. Caribbean Sea (o.d.). Gulf of Mexico (42, o.d.). Tropical, sub-tropical and temperate seas.

O. steinii Schütt. Florida Strait (o.d.). Tropical, sub-tropical and temperate seas.

- O. thurnii* (Schmidt) Kof. u. Skgsb. Florida Strait
(o.d.). Tropical, sub-tropical and temperate
seas.
- Ornithocerus* spp. Caribbean Sea (o.d.). Gulf of
Mexico (8, o.d.). Florida Strait (8).
- Histioneis* sp. Caribbean Sea (o.d.).
- Oxyrrhis marina* Dujard. Gulf of Mexico (42). Adriatic
Sea. Salt pools of Esthonia, Kharkov and Staraya
Russa. Salt and brackish water dweller.
- Oxyrrhis* spp. Gulf of Mexico (34, 35).
- Amphidinium acutissimum* Schill. Caribbean Sea (o.d.).
Florida Strait (o.d.). Tropical Atlantic.
Mediterranean and Arabian Seas.
- A. acutum* Lohm. Florida Strait (o.d.). Atlantic Ocean.
Mediterranean and Arabian Seas.
- A. latum* Leb. Florida Strait (o.d.). Tropical Atlantic.
Coastline of Britian. Mediterranean, Adriatic and
Arabian Seas.
- A. stigmatum* Schill. Florida Strait (o.d.). Mediterranean
and Adriatic Seas.
- Amphidinium* spp. Caribbean Sea (o.d.). Gulf of Mexico
(34, 35, 42, o.d.).
- Gymnodinium brevis* Davis. Gulf of Mexico (31, 32, 34,
35, 36, 39, 42, 45, 51, 58, 61, 63, 65).

- G. flavum* Koj. et Sw. Florida Strait (o.d.). Tropical Atlantic. California. Mediterranean Sea.
- G. Kowalevskii* Pitz. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.). Tropical Atlantic. Mediterranean and Arabian Seas.
- G. najadeum* Schill. Florida Strait (66). Tropical Atlantic. Mediterranean and Arabian Seas.
- G. ostenfeldi* Schill. Florida Strait (o.d.). Mediterranean and Arabian Seas.
- G. pulchrum* Schill. Gulf of Mexico (o.d.). Mediterranean Sea. 34
- G. punctatum* Pouch. Florida Strait (o.d.). Atlantic Ocean. (Tropical part and coastline of France).
- G. semidivisum* Schill. Florida Strait (o.d.). Mediterranean, Arabian and Black Seas.
- G. simplex* (Lohm.) Kof. et Sw. Gulf of Mexico (34, 35, 51). Tropical Atlantic. Adriatic, Ionian, Arabian and Azov Seas.
- G. splendens* Leb. Gulf of Mexico (34, 35). Plymouth. Adriatic, Arabian and Black Seas. Coastal form.
- G. variabile* Herd. Gulf of Mexico (o.d.). Florida Strait (66). Tropical Atlantic. Irish, Mediterranean, Arabian and Black Seas.
- G. wulfii* Schill. Gulf of Mexico (o.d.). Florida Strait (66, o.d.). Tropical Atlantic. Mediterranean, Arabian and Barents Seas. Sea of Japan. Neritic.

Gymnodinium spp. Caribbean Sea (o.d.). Gulf of Mexico
(8, 28, 34, 35, 44, 49, o.d.). Florida Strait
(66, o.d.).

Katodinium rotundatum (Lohm.) Fott. Caribbean Sea
(o.d.). Gulf of Mexico (o.d.). Florida Strait
(o.d.). North Sea. Plymouth. Keel bay.
Mediterranean, Black and Arabian Seas. Neritic.

Katodinium sp. Florida Strait (o.d.).

Gyrodinium adriaticum Schill. Florida Strait (66).
Mediterranean, Arabian and Black Seas. Brackish
water dweller.

G. fusiforme Kof. et Sw. Gulf of Mexico (o.d.).
Florida Strait (66, o.d.). Arctic Ocean. Barents
Sea. Belgium. Tropical Atlantic. Mediterranean
and Arabian Seas.

G. pingue (Schutt) Kof. et Sw. Florida Strait (o.d.).
Pacific Ocean (near California): Atlantic Ocean.
Barents, North, Mediterranean, Arabian, Black and
Azov Seas. Sea of Japan. Neritic-Oceanic.

G. spirale (Bergh.) Kof. et Sw. Gulf of Mexico (34, 35).
Barents, Baltic, Mediterranean, Arabian, Black
and Azov Seas. Sea of Japan. Neritic-Oceanic.

G. wulfii Schill. Florida Strait (66). Barents Sea.
Neritic.

Gyrodinium spp. Caribbean Sea (o.d.). Gulf of Mexico

(34, 35, o.d.). Florida Strait (66, o.d.).

Cochlodinium scintillans Kof. et Sw. Florida Strait

(o.d.). Pacific Ocean (California).

Torodinium sp. Gulf of Mexico (35).

Polycricos hartmanii Zimmerm. Gulf of Mexico (61).

Bay of Naples.

Polycricos sp. Gulf of Mexico (34, 35).

Warnovia spp. (Pouchetia spp.). Gulf of Mexico

(34, o.d.).

Pyrophacus horologicum Stein. var. horologicum Stein.

Gulf of Mexico (8, 42). Florida Strait (8). Warm

water areas of the ocean. Northern part of the

Atlantic Ocean. Coastline of Britain. North,

Baltic, Adriatic, Aegian, Black and Azov Seas.

P. horologicum Stein. var. steinii Schill. Gulf of

Mexico (8). Warm waters of the ocean. Sea of

Azov.

Glenodinium apiculatum Zach. Florida Strait (o.d.).

Mediterranean Sea.

G. paululum Lindem. Caribbean Sea (o.d.). Gulf of

Mexico (o.d.). Florida Strait (11, o.d.). Tropical

Atlantic. Mediterranean, Arabian, Black, and

Azov Seas.

Glenodinium spp. (Peridiniopsis spp.). Caribbean Sea
(52, o.d.). Gulf of Mexico (8, 34, o.d.). Florida
Strait (11, o.d.).

Diplopsalis lenticula Bergh. Florida Strait (o.d.).
Widely distributed in the USSR. Mediterranean and
Arabian Seas. Oceanic.

Peridinium breve Pauls. Gulf of Mexico (o.d.). Widely
distributed in the Seas of the USSR. Tropical
Atlantic. Mediterranean Sea. Oceanic.

P. brevipes Pauls. Florida Strait (66). Arctic Ocean.
Barents, Kara, Bering, Baltic, Black, Mediterranean
and Arabian Seas. Sea of Laptev. Sea of Japan.

P. bulla Meun. Florida Strait (o.d.). Tropical Atlantic.
Barents Sea. Neritic.

P. curvipes Ostf. Caribbean Sea (o.d.). Widely distributed
from Greenland to the tropical zone of the Atlantic.
Barents, Bering, Okhotsk, Baltic and Mediterranean
Seas. Sea of Japan. Neritic.

P. depressum Bail. Gulf of Mexico (34, 42, o.d.).
Florida Strait (o.d.). Nearly in all seas of the
USSR. Tropical Atlantic. Adriatic and Arabian
Seas. Neritic-Oceanic.

P. depressum Bail. (?). Gulf of Mexico (8). Florida
Strait (8).

- P. diabolus* Cl. Gulf of Mexico (35). Atlantic Ocean.
Indian Ocean. Mediterranean and Black Seas. Sea
of Japan. Warm water dweller. Oceanic.
- P. digitale**. Gulf of Mexico (35).
- P. divergens* Ehr. Gulf of Mexico (34, 35). Widely
distributed. Tropical Atlantic. Mediterranean,
Black, Azov and Bering Seas. Sea of Japan.
Neritic.
- P. elegans* Cl. f. *elegans* Cl. Gulf of Mexico (o.d.).
Florida Strait (o.d.). Tropical Atlantic.
Indian Ocean. Black Sea.
- P. elegans* Cl. f. *elegans* Cl. (?). Gulf of Mexico (8).
- P. elegans* Cl. f. *granulata* (Karst.) Matz. Gulf of
Mexico (o.d.). Tropical Atlantic. Pacific Ocean.
Indian Ocean. Abundant in coastal zones.
- P. globosum* Dang. Florida Strait (o.d.). African
coastline of the Atlantic Ocean. Mediterranean
Sea.

* The authors who described this variety have not been
established.

- P. Globulus* Stein. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). In all oceans. Adriatic, Aegian, Arabian, Black, Azov and Barents Seas. Oceanic.
- P. granii* Ostf. f. mite (Pav.) Schill. Gulf of Mexico (o.d.). Warm and cold seas. Tropical Atlantic.
- P. heterocanthum* Dang. Florida Strait (o.d.). Atlantic Ocean. Indian Ocean. Mediterranean Sea.
- P. leonis* Pav. Gulf of Mexico (8). Atlantic Ocean. Indian Ocean. Mediterranean, Black and Okhotsk Seas. Sea of Japan. Neritic.
- P. minusculum* Pav. Gulf of Mexico (o.d.). Florida Strait (o.d.). European Seas. Sea of Japan. Tropical Atlantic.
- P. minimum* Kof. Florida Strait (o.d.). Tropical Atlantic. Plymouth. Baltic, Mediterranean, and Black Seas. Sea of Japan.
- P. nipponicum* Abe. Gulf of Mexico (o.d.). Indian Ocean. Arabian Sea. Sea of Japan.
- P. ovum* Schill. Gulf of Mexico (o.d.). Warm waters of the Pacific and Atlantic oceans. Mediterranean Sea.
- P. triquetrum* (Ehr.) Leb. Florida Strait (66, o.d.). Tropical Atlantic. Mediterranean, Arabian, Black, Barents, Kara and Okhotsk Seas. Sea of Japan. Neritic. Found in brackish waters.

- P. trochoideum* (Stein.) Lemm. Caribbean Sea (o.d.).
Gulf of Mexico (o.d.). Florida Strait (o.d.).
Tropical Atlantic. Mediterranean, Black, Azov,
Kara, Baltic, Aral and Bering Seas. Sea of
Japan. Neritic. Found in salt and brackish
waters.
- P. tuba* Schill. Gulf of Mexico (o.d.). Florida Strait
(66, o.d.). Tropical Atlantic. Mediterranean
Sea.
- P. Sinaicum* Schill. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.). Indian Ocean. Tropical Atlantic.
Arabian Sea.
- P. wiesneri* Schill. Gulf of Mexico (o.d.). Atlantic
Ocean. Adriatic Sea.
- Peridinium* spp. Caribbean Sea (o.d.). Gulf of Mexico
(8, 34, 35, o.d.). Florida Strait (o.d.).
- Coniaulax catenella* Whed. et Kof. Gulf of Mexico
(42, 55, 59, 61).
- G. diegensis* Kof. Caribbean Sea (o.d.). Gulf of
Mexico (61). Barents, Black Seas. English Channel.
Tropical Atlantic. California coastline. Neritic.
- G. gracilis* Schill. Florida Strait (o.d.). Tropical
Atlantic.
- G. minima* Matz. Caribbean Sea (o.d.). Gulf of Mexico
(o.d.). Indian Ocean. Tropical Atlantic.
Mediterranean, Black and Azov Seas.

- G. minuta* Kof. et Mich. Gulf of Mexico (o.d.). Warm waters in the eastern part of the Pacific Ocean.
- G. monilata**. Gulf of Mexico (61).
- G. polyedra* Stein. Caribbean Sea (o.d.). Tropical Atlantic. Adriatic, Ionian, Arabian, Black and Azov Seas (according to Paulsen, in cold waters).
- G. polygramma* Stein. Florida Strait (o.d.). Tropical, sub-tropical and temperate waters. Barents Sea. Neritic-Oceanic.
- G. Scrippsae* Kof. Gulf of Mexico (o.d.). Florida Strait (o.d.). Plymouth. California coastline. Tropical Atlantic. Mediterranean, Arabian, Black and Azov Seas.
- G. spinifera* (Clap. et Lachm.) Dies (?). Gulf of Mexico (33).
- G. tamarensis* Leb. (?). Gulf of Mexico (42).
- G. turbinei* Murr. et Whitt. Caribbean Sea (o.d.). Warm waters of the Pacific Ocean. California. Tropical Atlantic. Mediterranean Sea.
- Goniaulax* spp. Caribbean Sea (o.d.). Gulf of Mexico (8, 34, 35, 43, o.d.). Florida Strait (o.d.).

* The authors who described this variety have not been established.

- Amphidoma sp. Caribbean Sea (o.d.). Florida Strait
(o.d.).
- Protoceratium areolatum Kof. Florida Strait (66).
Pacific and Indian Oceans. Tropical Atlantic.
Adriatic Sea.
- Pr. reticulatum (Clap. et Lachm.) Bütschli. Gulf of
Mexico (o.d.). Coastline of Greenland. Coastlines
of Europe. Tropical Atlantic. Black and Barents
Seas. Bosphorus, Neritic.
- Protoceratium sp. Caribbean Sea (o.d.).
- Heterodinium sp. Gulf of Mexico (o.d.).
- Ceratium arietinum Cl. f. arietinum Cl. Florida Strait
(o.d.). Atlantic and Indian Oceans. Mediterranean
and Arabian Seas. Sea of Japan.
- C. arietinum Cl. f. detortum (Stüwe) Jörg. Gulf of
Mexico (8). Tropical and sub-tropical areas of
all oceans.
- C. azoricum Cl. Gulf of Mexico (8). Tropical and
sub-tropical areas of all oceans. Mediterranean
Sea.
- C. belone Cl. Caribbean Sea (o.d.). All oceans.
Mediterranean Sea. Warm water dweller.
- C. breve (Ostf. et Schmidt) Schröd. var. parallelum
(Schmidt.) Jörg. Gulf of Mexico (o.d.). Indian,
Atlantic and Pacific Oceans. Mediterranean Sea.
Warm water dweller.

- C. bucephalum* Cl. (?). Gulf of Mexico (8).
- C. buceros* Zach. var. *denticulatum* (Jörg) Pauls.
(*C. tenue* (Ostf. et Schmidt.) Jörg). Gulf of Mexico (8). Oceanic. Warm water dweller.
- C. carriense* Gourr. f. *carriense* Gourr. Caribbean Sea (o.d.). Gulf of Mexico (42, o.d.). Tropical Atlantic. Mediterranean Sea. Warm water dweller.
- C. carriense* Gourr. f. *ceylanicum* (Schrod) Jörg.
Gulf of Mexico (o.d.). All seas. Warm water dweller.
- C. carriense* Gourr. f. *volans* (Cl.) Jörg. Gulf of Mexico (o.d.). Tropical Atlantic.
- C. concilians* Jörg. Gulf of Mexico (o.d.). Florida Strait (o.d.). All oceans. Mediterranean Sea. Warm water dweller.
- C. contortum* (Gourr.) Cl. var. *contortum* (Gourr.) Cl.
Gulf of Mexico (o.d.). All oceans. Adriatic Sea. Warm water dweller.
- C. contortum* (Gourr.) Cl. var. *saltans* Jörg. Gulf of Mexico (o.d.). Atlantic and Indian Oceans. Mediterranean Sea. Sea of Japan. Warm water dweller.

- C. contrarium* Gourr. Gulf of Mexico (8). Florida Strait (8). Mediterranean Sea. Warm water dweller.
- C. declinatum* Karst. Florida Strait (o.d.). Tropical Atlantic. Mediterranean Sea. Warm water dweller.
- C. deflexum* (Kof.) Jörg. Gulf of Mexico (o.d.). Indian and Pacific Oceans. Sea of Japan. South-China Sea. East China Sea. Red Sea. Warm water dweller. Oceanic.
- C. extensum* (Gourr.) Cl. f. *extensum* (Gourr.) Cl. Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.). Tropical Atlantic. Indian Ocean. Mediterranean, Red, and Black Seas. Sea of Japan. South China Sea. Oceanic.
- C. extensum* (Gourr.) Cl. f. *strictum* (Okam. et Nishik) St.-Niels. Gulf of Mexico (o.d.). Tropical Atlantic. Indian Ocean. Mediterranean, Red and Black Seas. Sea of Japan. South China Sea. Oceanic.
- C. falcatum* (Kof.) Jörg. Gulf of Mexico (42). Adriatic Sea.
- C. furca* (Ehr.) Clap. et Lachm. var. *furca* (Ehr.) Clap. et Lachm. Gulf of Mexico (8, 31, 34, 35, 37, 42, 61, o.d.). Florida Strait (o.d.). Tropical Atlantic. Barents, Black, Azov and Arabian Seas. Oceanic-Neritic.

- C. furca* (Ehr.) Clap. et Lachm. var. *eugrammum* (Ehr.) Jörg. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic, Black and Barents Seas. Sea of Japan. Warm water dweller. Oceanic, neritic.
- C. fusus* (Ehr.) Dujard. var. *fuscus* (Ehr.) Dujard. Gulf of Mexico (8, 33, 34, 35, 42, o.d.). Florida Strait (8, 66, o.d.). Atlantic Ocean. Adriatic, Black, Azov, Arabian and Barents Seas. Warm water dweller. Oceanic.
- C. fusus* var. (Ehr.) Dujard *seta* (Ehr.) Jörg. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic and Black Seas. Warm water dweller. Oceanic.
- C. geniculatum* (Lemm.) Cl. (?). Gulf of Mexico (8).
- C. hexacanthum* Gouss. var. *hexacanthum* Gouss. f. *hexacanthum* Gouss. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic Sea. Sea of Japan. Warm water dweller.
- C. hexacanthum* Gouss. var. *hiemale* Pav. Gulf of Mexico (8, o.d.).
- C. hexacanthum* Gouss. f. *contortum* (Lemm.) Jörg. Gulf of Mexico (8). Tropical Atlantic.
- C. hexacanthum* Gouss. f. *spirale* (Kof.) Schill. Gulf of Mexico (o.d.). All warm waters.

- C. horridum Gran. Gulf of Mexico (42). Atlantic Ocean. Barents, North, Okhotsk and Adriatic Seas. Sea of Japan. Oceanic.
- C. inflatum (Kof.) Jörg. Gulf of Mexico (8). Tropical Atlantic. Adriatic and Red Seas. Sea of Japan. South China Sea. East China Sea. Gibraltar. Warm water dweller.
- C. karstenii Pav. Gulf of Mexico (8). Florida Strait (66). Oceans and peripheral areas. Adriatic and Arabian Seas. Warm water dweller.
- C. Koffoidii Jörg. Florida Strait (o.d.). Atlantic, Indian and Pacific Oceans. Mediterranean and Arabian Seas.
- C. lineatum (Ehr.) Cl. Gulf of Mexico (8). Florida Strait (8). Tropical Atlantic. Adriatic, Black, Barents, Norwegian, North and Okhotsk Seas. Sea of Japan. European coastlines. Neritic-oceanic.
- C. longinum Karst. Gulf of Mexico (8). Florida Strait (8, o.d.). Tropical Atlantic. Warm water dweller.
- C. macroceros (Ehr.) Cl. var. macroceros (Ehr.) Cl. Gulf of Mexico (42, o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic and Black Seas. Carried by warm currents to the Barents Sea and the Sea of Japan. Oceanic. Found in moderately warm waters.

- C. macroceros* (Ehr.) Cl. var. *gallicum* (Kof.) Jörg.
Gulf of Mexico (8, o.d.). Atlantic, Indian and
Pacific Oceans. Mediterranean and Arabian Seas.
Warm water dweller.
- C. Massiliense* (Gourr.) Jörg. f. *massiliense* (Gourr.)
Jörg. Gulf of Mexico (42, o.d.). Florida Strait
(o.d.). Atlantic and Indian Oceans. Mediterranean
and Arabian Seas. South China Sea. East China
Sea. Sea of Japan. Warm water dweller.
- C. massiliense* (Gourr.) Jörg. f. *protuberans* (Karst.)
Jörg. Gulf of Mexico (o.d.). Tropical Atlantic.
Sea of Japan. Warm water dweller.
- C. pentagonum* Gourr. Gulf of Mexico (8, 42). Florida
Strait (o.d.). Atlantic Ocean. Adriatic, Black
and Arabian Seas. Oceanic.
- C. praelongum* (Lemm.) Kof. Gulf of Mexico (42).
Atlantic, Indian and Pacific Oceans. Mediterranean
Sea. Warm water dweller.
- C. pulchellum* Schröd. Gulf of Mexico (o.d.). Tropical
Atlantic. Mediterranean Sea. Oceanic. Warm
water dweller.
- C. schmidtii* Jörg. Florida Strait, (26). Atlantic,
Indian and Pacific Oceans. Gulf of Siam. South
China Sea. Warm water dweller.

- C. setaceum* Jörg. Caribbean Sea (o.d.). Atlantic and Pacific Oceans. Adriatic Sea. Warm water dweller.
- C. teres* Kof. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.). Atlantic, Indian and Pacific Oceans. Mediterranean Sea. Sea of Japan. Warm water dweller.
- C. trichoceros* (Ehr.) Kof. var. *trichoceros* (Ehr.) Kof. f. *trichoceros* (Ehr.) Kof. Gulf of Mexico (8, 42, o.d.). Florida Strait (8, o.d.). Atlantic, Indian and Pacific Oceans. Mediterranean, Red, Arabian Seas. Sea of Japan. Warm water dweller.
- C. trichoceros* (Ehr.) Kof. var. *contrarium* (Gourr.) Schill. Gulf of Mexico (o.d.). Tropical Atlantic. Mediterranean and Arabian Seas. Warm water dweller.
- C. tripos* (O' Müll) Nitzsch. var. *tripos* (O' Müll) Nitzsch. Caribbean Sea (o.d.). Gulf of Mexico (8, 34, 42). Florida Strait (8). Northern Seas. Tropical Atlantic. Adriatic, Arabian and Azov Seas. Oceanic.
- C. tripos* (O' Müll) Nitzsch. var. *arietinum* Cl. Caribbean Sea (26). Arabian Sea.

- C. tripos* (O' Müll.) Nitzsch. var. *atlanticum* Ostf.
Gulf of Mexico (8, o.d.). Florida Strait (8).
In oceans and peripheral areas. Barents Sea.
Oceanic. Warm water dweller.
- C. tripos* (O' Müll) Nitzsch. var. *subsalsum* Ostf.
Gulf of Mexico (8). Tropical Atlantic. Barents,
Norwegian, Baltic and Adriatic Seas. Sea of
Japan.
- C. vultur* Cl. var. *vultur* Cl. Gulf of Mexico (8).
Florida Strait (8). Atlantic, Indian and Pacific
Oceans. Adriatic Sea. Warm water dweller.
- C. vultur* Cl. var. *sumatranum* (Karst.) St.-Niels.
Gulf of Mexico (8, o.d.). Florida Strait (8).
Sea of Japan. Warm water dweller.
- Ceratium* spp. Caribbean Sea (62). Gulf of Mexico
(8, 33, o.d.). Florida Strait (8, o.d.). 39
- Goniodoma sphaericum* Murr. et Whitt. Florida Strait
(o.d.). Atlantic and Indian Oceans. Mediterranean
Sea.
- Goniodoma* spp. Gulf of Mexico (42). Florida Strait
(o.d.).
- Ceratocorys gouretyi* Pauls. Gulf of Mexico (o.d.).
All seas. Tropical Atlantic. Warm water dweller.
- Ceratocorys* sp. Gulf of Mexico (o.d.).

- Oxytoxum adriaticum* Schill. Caribbean Sea (o.d.).
Florida Strait (o.d.). Mediterranean Sea.
- O. caudatum* schill. Gulf of Mexico (o.d.). Florida
Strait (o.d.). Mediterranean Sea.
- O. constrictum* (Stein.) Bütschli. Caribbean Sea (o.d.).
Gulf of Mexico (o.d.). Tropical Atlantic.
Mediterranean Sea.
- O. coronatum* Schill. Caribbean Sea (o.d.). Adriatic
Sea.
- O. crassum* Schill. Caribbean Sea (o.d.). Florida
Strait (o.d.). Tropical Atlantic. Mediterranean
Sea. Adriatic Sea.
- O. elegans* Pav. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.). Tropical Atlantic. Mediterranean
Sea.
- O. gladiolus* Stein. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.). Florida Strait (ll, o.d.).
Tropical Atlantic. Mediterranean and Barents
Seas. Oceanic.
- O. globosum* Schill. Gulf of Mexico (o.d.). Florida
Strait (o.d.). Mediterranean Sea.
- O. gracile* Schill. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.). Florida Strait (o.d.). Adriatic
and Arabian Seas.

- O. *laticeps* Schill. Florida Strait (66). Tropical Atlantic. Mediterranean and Arabian Seas.
- O. *longiceps* Schill. Gulf of Mexico (o.d.). Florida Strait (o.d.). Adriatic Sea.
- O. *mediterraneum* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean Sea.
- O. *ovale* Schill. Gulf of Mexico (o.d.). Adriatic Sea.
- O. *parum* Schill. Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean and Arabian Seas.
- O. *sceptrum* (Stein.) Schröd. Caribbean Sea (o.d.). Tropical Atlantic. Mediterranean Sea.
- O. *scolopax* Stein. Gulf of Mexico (o.d.). Florida Strait (66, o.d.). All oceans. Mediterranean and Arabian Seas. Warm water dweller.
- O. *sphaeroideum* Stein. Caribbean Sea (o.d.). Florida Strait (66, o.d.). Atlantic Ocean. Mediterranean Sea. Warm water dweller.
- O. *turbo* Kof. Florida Strait (o.d.). Eastern seaboard of the Pacific Ocean (tropical part). Arabian Sea.
- O. *variabile* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean and Arabian Seas. Black Sea.

- O. viride* Schill. Gulf of Mexico (o.d.). Florida Strait (o.d.). Mediterranean and Arabian Seas.
- Oxytoxum* spp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.).
- Cladopyxis bacillifera* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic, Ionian and Aegian Seas.
- C. brachiolata* Stein. Caribbean Sea (o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean Sea. Black Sea. 40
- C. setifera* Lohm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Tropical Atlantic. Mediterranean, Arabian and Baltic Seas.
- Cladopyxis* sp. Gulf of Mexico (o.d.).
- Podolampas bipes* Stein f. *bipes* Stein. Gulf of Mexico (8, o.d.). All oceans. Carried by current into cold areas. Warm water dwellers.
- P. bipes* Stein. f. *reticulata* (Kot.) Schill. Gulf of Mexico (o.d.). Tropical Atlantic. East tropical part of the Pacific Ocean. Warm water dwellers.
- P. palmipes* Stein. Florida Strait (66, o.d.). All oceans. Carried by current to the north. Mediterranean and Arabian Seas. Warm water dweller.

- P. spinifer* Okam. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean and Arabian Seas.
- Podolampas* sp. Florida Strait (o.d.).
- Blepharocysta* sp. Caribbean Sea (o.d.).
- Pyrocystis fusiformis* (W. Th.) Murr. Gulf of Mexico (8, o.d.). Florida Strait (o.d.). Warm waters of all oceans and adjoining seas. Adriatic Sea.
- P. hamulus* Cl. Gulf of Mexico (42), Florida Strait (o.d.). Tropical Atlantic. Warm water dwellers.
- P. lunula* Schütt. Gulf of Mexico (8). Tropical Atlantic. Carried to brackish waters of the Baltic Sea. Adriatic, Aegian and Black Seas. Neritic.
- P. pseudonoctiluca* (W. Th.) Schill. Gulf of Mexico (8, o.d.). Florida Strait (8, o.d.). In all Seas. Warm water dweller.
- P. robusta* Kof. Gulf of Mexico (o.d.). Tropical Atlantic.
- Pyrocystis* spp. Caribbean Sea (62). Gulf of Mexico (42, o.d.).
- Phytodinium* sp. Gulf of Mexico (o.d.).
- Hypnodinium* sp. Gulf of Mexico (o.d.).
- Cystodinium* sp. Florida Strait (o.d.).

Stylodinium sp. Florida Strait (o.d.).

Protodinium sp. Florida Strait (o.d.).

Goniodinium cristatum Dang. Caribbean Sea (o.d.).

Coastal waters of Portugal.

CRYPTOMONADINEAE

Cryptomonas sp. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.).

Rhodomonas sp. Gulf of Mexico (o.d.).

Hillea fusiformis Schill. Caribbean Sea (o.d.).

Gulf of Mexico (o.d.). Florida Strait (o.d.).

Tropical Atlantic. Adriatic and Arabian Seas.

CHRYSOPHYTA

Coccolithineae

Acanthosolenia sp. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.).

Acanthoica acanthos (Schill.) Defl. Florida Strait
(o.d.). Tropical Atlantic. Mediterranean and
Arabian Seas.

- Athosphaera quadricornu* Lec.-Schlaud. Caribbean Sea
(o.d.). Gulf of Mexico (o.d.). Tropical Atlantic.
Adriatic and Arabian Seas.
- A. robusta* (Lohm.) Kampt. Gulf of Mexico (o.d.).
Tropical Atlantic. Mediterranean Sea.
- Calciosolenia grani* Schill. var. *grani*, Schill.
Caribbean Sea (o.d.). Gulf of Mexico (o.d.).
Florida Strait (o.d.). Atlantic Ocean. Adriatic
Sea.
- C. grani* Schill. var. *closterium* Schill. Gulf of Mexico
(o.d.). Florida Strait (o.d.). Tropical Atlantic.
Adriatic Sea.
- C. grani* Schill. var. *cylindrothecaeformis* Schill.
Gulf of Mexico (o.d.). Florida Strait (o.d.).
Tropical Atlantic. Adriatic Sea.
- C. murrayi* Gran. Caribbean Sea (o.d.). Florida Strait
(o.d.). Tropical Atlantic. Adriatic, Ionian,
Aegian and Arabian Seas.
- C. sinuosa* Schlaud. Caribbean Sea (o.d.). Florida
Strait (66, o.d.). Tropical Atlantic. Mediterranean
and Arabian Seas.
- Calciosolenia* sp. Gulf of Mexico (o.d.).
- Calyptosphaera globosa* Lohm. Gulf of Mexico (o.d.).
Mediterranean Sea.

- C. insignis* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic and Ionian Seas.
- C. oblonga* Lohm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Atlantic Ocean. Mediterranean and Black Seas.
- C. sphaeroidea* Schill. Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic, Ionian, Aegian Seas.
- C. uvella* Schill. Florida Strait (o.d.). Tropical Atlantic. Adriatic Sea.
- Calyptosphaera* spp. Gulf of Mexico (o.d.). Florida Strait (o.d.).
- Ceratolithus lyramuliformis* Rouch. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Tropical Atlantic.
- Coccolithophora meteori* (Schill.). Hentsch. Florida Strait (o.d.). Atlantic Ocean.
- Coccolithophora* sp. Gulf of Mexico (25).
- Coccolithus huxleyi* (Lohm.) Kampt. Caribbean Sea (o.d.). Gulf of Mexico (61, o.d.). Florida Strait (66, o.d.). Widely distributed.
- C. pelagicus* (Wallich) Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.). Atlantic and Indian Oceans. Barents, North and Mediterranean Seas. English Channel.

- C. sibogae* (Web. van Ros.) Schill. Caribbean Sea
(o.d.). Gulf of Mexico (o.d.). Florida Strait
(66, o.d.). Indian Ocean. Tropical Atlantic.
Adriatic and Arabian Seas.
- C. wallichii* (Lohm.) Schill. Caribbean Sea (o.d.).
Gulf of Mexico (o.d.). Florida Strait (o.d.).
Atlantic Ocean. Mediterranean and Arabian Seas.
- Coccolithus* spp. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.). Florida Strait (o.d.).
- Corisphaera gracilis* Kampt. Caribbean Sea (o.d.).
Florida Strait (o.d.). Tropical Atlantic.
Mediterranean Sea.
- Corisphaera* sp. Caribbean Sea (o.d.). Gulf of Mexico
(o.d.). Florida Strait (o.d.).
- Cyclococcolithus fragilis* (Lohm.) Defl. Caribbean Sea
(54). Gulf of Mexico (o.d.). Florida Strait
(o.d.). Tropical Atlantic. Mediterranean Sea.
- C. Leptoporus* (Murr. et Black.) Kampt. Caribbean Sea
(o.d.). Gulf of Mexico (o.d.). Florida Strait
(o.d.). Widely distributed.
- Deutschlandia anthos* Lohm. Caribbean Sea (o.d.).
Gulf of Mexico (o.d.). Florida Strait (o.d.).
Atlantic Ocean. Adriatic and Arabian Seas.
- D. stenophylla* Schill. Caribbean Sea (o.d.). Florida
Strait (o.d.). Southern part of the Atlantic Ocean.

Deutschlandia sp. Gulf of Mexico (o.d.). Florida Strait (o.d.).

Discosphaera thomsonii Ostf. Caribbean Sea (o.d.).
Gulf of Mexico (o.d.). Florida Strait (66, o.d.).
Atlantic Ocean. Mediterranean and Arabian Seas.
Oceanic.

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D. tubifera (Murr. et Black.) Lohm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Atlantic Ocean. Mediterranean and Arabian Seas. Warm water dweller.

Halopappus adriaticus Schill. Gulf of Mexico (o.d.).
Tropical Atlantic. Adriatic Sea.

H. vahseli Lohm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Atlantic Ocean (North equatorial, Brazilian, Guirean currents).
Adriatic, Arabian Seas.

Halopappus sp. Gulf of Mexico (o.d.).

Helladosphaera aurisinae Kampt. Caribbean Sea (o.d.).
Florida Strait (o.d.). Yugoslavia. Adriatic Sea.

H. corona (Kampt.) Lec.-Schlaud. Florida Strait (o.d.).
Yugoslavia.

Hymenomonas discopora (Schill.) Kampt. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic Sea.

- H. syracusana* (Lohm). Kampt. Gulf of Mexico (o.d.).
Atlantic Ocean. Mediterranean Sea.
- Lohmanosphaera adriatica* Schill. Gulf of Mexico (o.d.).
Tropical Atlantic. Adriatic Sea.
- Mallomonas roseola* Copeland. Gulf of Mexico (o.d.).
Europe.
- Michalsarsia falclandica* Lohm. Gulf of Mexico (o.d.).
Atlantic Ocean. Adriatic Sea.
- M. elegans* Gran. Caribbean Sea (o.d.). Florida Strait
(o.d.). Tropical Atlantic.
- M. Splendens* Lohm. Caribbean Sea (o.d.). Gulf of
Mexico (o.d.). Florida Strait (66, o.d.). Atlantic
Ocean. Adriatic Sea.
- Michalsarsia* sp. Caribbean Sea (o.d.).
- Ophiaster hydroideus* (Lohm.). Lohm. Caribbean Sea
(o.d.). Gulf of Mexico (o.d.). Florida Strait
(o.d.). Atlantic Ocean. Mediterranean Sea.
- Pontosphaera hoeckeili* Lohm. Gulf of Mexico (o.d.).
Atlantic Ocean. Mediterranean Sea. Arabian Sea.
Black Sea.
- P. inermis* Lohm. Caribbean Sea (o.d.). Tropical
Atlantic. Mediterranean and Black Sea.
- P. nigra* (Schill.) Schill. Gulf of Mexico (o.d.).
Tropical Atlantic. Adriatic and Black Seas.

- P. pellucida* Lohm. Gulf of Mexico (o.d.). Atlantic Ocean. Mediterranean Sea.
- P. pietschmanni* Kampt. Florida Strait (66). Mediterranean Sea.
- Pontosphaera* sp. (?) Lohm. Florida Strait (o.d.).
- P. steueri* Kampt. Caribbean Sea (o.d.). Adriatic Sea.
- Pontosphaera* spp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.).
- Rhabdolithus tignifer* (Schill.) Noel. Caribbean Sea (o.d.). Florida Strait (o.d.). Tropical Atlantic. Desalinized surface waters of the North Adriatic. Aegian Sea.
- Rhabdosphaera hispida* Lohm. Caribbean Sea (o.d.). Florida Strait (o.d.). Atlantic Ocean. North, Mediterranean and Black Seas.
- R. longistylis* Schill. Florida Strait (o.d.). Tropical Atlantic. Adriatic and Black Seas.
- R. stylifera* Lohm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Atlantic Ocean. Mediterranean, Arabian and Black Seas. Warm water dweller.
- R. tubulosa* Schill. Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean and Black Seas.

- Rhabdosphaera* sp. Gulf of Mexico (25).
- Scyphosphaera apsteini* Lohm. Caribbean Sea (o.d.).
Florida Strait (66, o.d.). Atlantic Ocean.
Mediterranean Sea.
- S. elegans* (Ostf.) Defl. Caribbean Sea (o.d.). Gulf
of Mexico (o.d.). Florida Strait (o.d.).
Mediterranean Sea.
- Syracolithus corii* (Schill.) Lec. et Bernh. Caribbean
Sea (o.d.). Florida Strait (66, o.d.). Tropical
Atlantic. Adriatic Sea.
- S. dalmaticus* (Kampt.) Loeb. et Tapp. Gulf of Mexico
(o.d.). Florida Strait (66, o.d.). Tropical
Atlantic. Mediterranean Sea.
- Syracorhabdus Molischi* (Schill.) Lec. et Bernh. Florida
Strait (o.d.). Tropical Atlantic. Adriatic Sea.
- S. pulcner* (Lohm.) Lec et Bernh. Caribbean Sea (o.d.).
Gulf of Mexico (o.d.). Florida Strait (66, o.d.).
Atlantic Ocean. North, Mediterranean, Arabian
and Black Seas.
- Syracosphaera bifenestrata* Schill. Caribbean Sea,
(o.d.). Gulf of Mexico (o.d.). Florida Strait
(66, o.d.). Mediterranean and Arabian Seas.
- S. brasiliensis* Lohm. Caribbean Sea (o.d.). Atlantic
Ocean. Adriatic and Arabian Seas.

- S. cordiformis* Schill. Gulf of Mexico (o.d.). Adriatic Sea.
- S. cornifera* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Arabian and Mediterranean Seas.
- S. coronata* Schill. Caribbean Sea (o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic, Arabian, Aegian Seas.
- S. cupulifera* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic and Arabian Seas.
- S. dentata* Lohm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Atlantic Ocean. Mediterranean, Arabian and Black Seas.
- S. Grundi* Schill. Gulf of Mexico (o.d.). Tropical Atlantic. Adriatic Sea.
- S. mediterranea* Lohm. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Atlantic Ocean. North Sea. Mediterranean, Arabian and Black Seas.
- S. prolongata* Gran. Gulf of Mexico (o.d.). Florida Strait (o.d.). Atlantic Ocean. Arabian Sea.
- S. spinosa* Lohm. Florida Strait (o.d.). Atlantic Ocean. Mediterranean Sea. Arabian Sea.

- S. subsalsa* (Cohr.) Kampt. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Arabian Sea.
- S. tuberculata* Kampt. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Mediterranean Sea.
- Syracosphaera* spp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.).
- Tharocosphaera heimi* (Lohm.) Kampt. (*Syracosphaera heimi* Lohm.) Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.). Atlantic Ocean. Arabian Sea.
- Thorosphaera* spp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.).
- Umbellosphaera irregularis* Paashe. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Northern and tropical parts of the Atlantic Ocean. Warm water dweller.

SILICOFLAGELLATAE

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- Dictyocha fibula* var. *fibula* Ehr. Caribbean Sea (o.d.). Gulf of Mexico (8, o.d.). Florida Strait (66, o.d.). Atlantic Ocean. Indian Ocean. North, Mediterranean, Arabian and Black Seas. California.

D. fibula Ehr. var. *stapedia* (Haeck) Lemm. Gulf of Mexico (o.d.). Atlantic, Pacific and Indian Oceans.

Dictyocha sp. Gulf of Mexico (o.d.).

Distephanus speculum (Ehr.) Haeck. Gulf of Mexico (35, o.d.). Florida Strait (66). Indian Ocean. Tropical Atlantic. Ionian, Aegian, Arabian, Black and Azov Seas.

EBRIIDAE

Ebria sp. Gulf of Mexico (o.d.). Florida Strait (o.d.).

CYANOPHYTA

Synechococcus sp. Gulf of Mexico (o.d.).

Dactylococcopsis irregularis Smith. Florida Strait (o.d.). Found in stagnant waters around the outskirts of Stockholm. Northern part of the Caspian Sea at the estuary of the river Volga.

Dactylococcopsis sp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.).

Aphanocapsa feldmani Frey. Caribbean Sea (38).

A. raspaigellae (Hauck.) Frey. Caribbean Sea (38).

Aphanothoe Karukerae Lami. Caribbean Sea (38).

Gloeocapsa turgida (Kütz) Hollerb. (*Chroococcus turgidus* (Kütz.). Nägel. Caribbean Sea (38). Universal. Found in fresh and salt water; in ultra-haline bodies of water; in thermal waters and on land.

Gloeocapsa sp. Gulf of Mexico (o.d.).

Entophysalis granulosa Kütz. Caribbean Sea (38). Universal.

Xenococcus acervatus Setch. et Gard. Caribbean Sea (38). North America, France, California coastline, Ceylon, Canary Islands, Antilles.

Aspalatia crassior Erceg. Gulf of Mexico (o.d.). On stones in the coastal zone of the Adriatic.

Mastigocoleus testarum Lagerh. Caribbean Sea (38). European coastline. Coastlines of North America, Antilles, Jamaica, South Africa. Baltic, North and Mediterranean Seas. California seaboard.

Mastigocoleus sp. Gulf of Mexico (o.d.).

Brachytrichia dalmatica (Erceg.) Fremy. Caribbean Sea (38).

B. maculans Gom. Caribbean Sea (38). Found on stones and shells along the coastlines of Europe, North America and Eastern Asia.

- Hormothamnion enteromorphoides* Grun. Caribbean Sea
(38). Around the Antilles. Islands in the Pacific
Ocean. Mauritius. Canary Islands.
- Calothrix aeruginea* Thur. Caribbean Sea (38). Black
Sea. Sea of Japan. International (according to
Geitler).
- C. contarenii* (Zanard) Born. et Flach. Caribbean Sea
(38). Coastlines of Europe, North America, New
Caledonia. Black Sea.
- C. crustacea* Thur. Caribbean Sea (38). International.
- C. fucicola* (Kütz.) Kossinsk. (*Dichothrix fucicola*
(Kütz.) Born. et Flah.). Caribbean Sea (38).
Coastline of Guadeloupe. Atlantic Ocean.
- C. parasitica* (Chauv.) Thur. Caribbean Sea (38).
Coastlines of Europe, Africa and North America.
Black Sea.
- C. penicillata* Zanard (*Dichotrix penicullata* Zanard). 45
Caribbean Sea (38). Coastline of Guadeloupe,
Jamaica. Atlantic Ocean. India.
- C. pilosa* Harv. Caribbean Sea (38).
- Calothrix* sp. Gulf of Mexico (o.d.).
- Dichothrix olivacea* Born et Flah. Caribbean Sea (38).
Damp stones and coastline of Africa and the West
Indies.

Oscillatoria erythrea (Ehr.) Geitl. (*Skujaella erythreum*
Trichodesmium erytreum Ehr.). Gulf of Mexico
(25, 50, 61, o.d.). Florida Strait (o.d.).
Atlantic Ocean (near Brazil). Pacific Ocean (near
Central America). Mediterranean Sea. Coastlines
of Australia, Java, Maldive Islands. Plankton.
Warm water dweller. Oceanic.

O. laetevirens Crouan. Caribbean Sea (38). Coastlines
of Europe, North-America, and Polynesian Islands.
Azov Sea.

O. mexicana Rouch. Gulf of Mexico (o.d.). Florida
Strait (o.d.). Tropical Atlantic.

O. miniata (Zanard) Hauck. Caribbean Sea (38). Coastline
of France. Adriatic Sea. Shorelines of Guadeloupe
and Ceylon.

O. nigro-viridis Thwait. Caribbean Sea (38).
Cosmopolitan. All coastlines.

O. thiebautii (Gom.) Geitl. (*Skujaella thiebautii*)
Caribbean Sea (o.d.). Gulf of Mexico (8, 33, 61,
o.d.). Florida Strait (8, 66, o.d.). Tropical
Atlantic. Indian Ocean. Adriatic and Arabian
Seas. Malay Archipelago. Around Naples. Southern
coast of Ireland.

Oscillatoria spp. (*Skujaella* spp., *Trichodesmium* spp.).
Caribbean Sea (24, 62, o.d.). Gulf of Mexico
(8, 24, 61, o.d.). Florida Strait (2, 8, o.d.).

Nostoc sp. Caribbean Sea (o.d.). Gulf of Mexico
(o.d.). Florida Strait (o.d.).

Borzia spongelliae (Schulze) Geitl. (*Phormidium spongellide*
(Schulze) Gom.). Caribbean Sea (38).

Spirulina sp. Gulf of Mexico (o.d.). Florida Strait
(66, o.d.).

Phormidium crossbyanum Tild. Caribbean Sea (38).
Shoreline of Hawaii.

P. hendersonii Howe. Caribbean Sea (38). Shoreline
of Cuba.

Phormidium sp. Gulf of Mexico (o.d.). Florida Strait
(66).

Symploca hydroides Kütz. Caribbean Sea (38). Cosmopolitan.
Coastlines.

Lyngbya aestuarii Liebm. Caribbean Sea (38). Plankton-
benthos. Cosmopolitan. Found in brackish and
salt waters. Rarer in fresh and hot waters.

L. confervoides Ag. Caribbean Sea (38). Tidal
coastlines. Stony areas, crevices. Cosmopolitan.

L. lutea (Ag.) Gom. Caribbean Sea (38). Cosmopolitan.
Sea coasts. Hot springs.

L. maiuscula Harv. Caribbean Sea (38). Cosmopolitan.
Typically marine. Tropics. Occasionally found
in clean fresh water.

- L. semiplena* Ag. Caribbean Sea (38). Cosmopolitan.
Along coastlines on stones and algae.
- L. sordida* (Zanard) Gom. Caribbean Sea (33). European
coastline. North-American coast, Antilles Islands.
"Druzhba" (Friendship) Islands. Mauritius.
Ceylon.
- Sirocoleus guyanensis* Kütz. Caribbean Sea (38).
Atlantic. Coastlines of Africa and South-America.
Shoreline of the Canary Islands. Guinea.
Estuary of the river Rio de la Plata near
Montevideo and Guiana.
- Microcoleus chthonoplastes* Thur. Caribbean Sea (38).
Cosmopolitan. Sea coasts. Brackish waters.
Varieties found on dry land.
- M. tenerrimus* Gom. Caribbean Sea (38). Coastlines
of Europe, North America, North Africa, Australia,
Indo-Malay Peninsula. Antilles. 46
- Hydrocoleus cantharidosus* (Mont.) Gom. Caribbean
Sea (38). Shorelines of the Canary Islands,
Guadeloupe, Ceylon, Australia, New Caledonia,
Indo-Malay Peninsula and the Antilles.
- H. comoides* (Harv.) Gom. Caribbean Sea (38). Shoreline
of Bermuda, Guadeloupe and Borneo.

H. glutinosus (Ag.) Gom. Caribbean Sea (38). Coastlines of Europe, North-America and Antilles. Malay Peninsula. Canary Islands.

H. lyngbyaceus Kütz. Caribbean Sea (38). Cosmopolitan. Salt, effluent waters. On marine vegetation, rocks and on land.

EUGLENOPHYTA

Euglena spp. Gulf of Mexico (34, 35, o.d.). Florida Strait (66, o.d.).

Eutreptia lanowi Steuer. Caribbean Sea (o.d.). Polluted ports (Trieste - northern Adriatic; Ragusa - southern part of Sicily). Clear waters of the Mediterranean and Black Sea.

Eutreptia spp. Caribbean Sea (o.d.). Gulf of Mexico (8).

Gymnastica elegans Schill. Caribbean Sea (o.d.). Florida Strait (o.d.).

Gymnastica sp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.).

Peranema spp. Gulf of Mexico (35).

CHLOROPHYTA

- Poropila dubia* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (66, o.d.).
- Pterosperma cristatum* Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Tropical Atlantic. Adriatic, Arabian, Black and Azov Seas. Pelagic.
- Pterosperma* spp. Caribbean Sea (o.d.). Gulf of Mexico (34, o.d.). Florida Strait (o.d.).
- Trochiscia paucispinosa* Schill. Caribbean Sea (o.d.). Adriatic and Black Seas.
- T. centrota*. Schill. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Adriatic, Arabian and Black Seas.
- Trochiscia* spp. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.):

XANTHOPHYTA

- Halosphaera viridis* Schmitz. Caribbean Sea (o.d.). Gulf of Mexico (o.d.). Florida Strait (o.d.). Carried by Gulf Stream and dispersed up to the Barents Sea, tropical. Atlantic, Adriatic, Arabian, Black and Azov Seas. Oceanic. Warm water dweller.

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