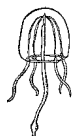


A CHECKLIST OF DINOFLAGELLATES RECORDED FROM THE RUSSIAN ARCTIC SEAS

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A checklist of dinoflagellates recorded from the Barents, White, Kara, Laptev, East Siberian and Chukchi seas and the central Arctic Basin has been compiled from the published data. Literature references from 1878 to 1997 are included in the bibliography and notes in regard to some of the taxa are given, where appropriate. A total of 189 species (not taking into account the taxa not identified to the species level), belonging to 16 families and 34 genera, are listed. The nomenclature is brought up to date.

Eine Gesamtliste von Dinoflagellaten aus der Barents-, Kara-, Laptev-, Chukchi- und der Ostsibirischen See sowie dem Weißen Meer und den zentralen arktischen Becken wurde aus Literaturdaten zusammengestellt. Die Literatur umfaßt Arbeiten von 1878 bis 1997. Zu einigen der Taxa wurden ergänzende Bemerkungen gemacht. Es wurden insgesamt 189 Arten aufgelistet (ausgenommen nicht bis zur Art identifizierte Taxa), die zu 16 Familien und 34 Ordnungen gehören. Die Nomenklatur wurde auf den neuesten Stand gebracht.

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KEYWORDS: dinoflagellates; flagellates; algae; phytoplankton; protozooplankton; plankton; Arctic; Eurasian Arctic; checklist.

INTRODUCTION

The Russian Arctic seas occupy about 4.5×10^3 km². Their phytoplankton has been studied for more than a hundred years. Among unicellular algae the dinoflagellates in the Arctic marine environment are exceeded in diversity only by diatoms. In some Arctic regions such as the northern Barents Sea, and in the southern Norwegian Sea, the number of planktonic dinoflagellates in summer was shown to exceed the number of planktonic diatoms (OKOLODKOV, 1997a). Nothing is known about benthic, in particular, psammophilic dinoflagellates. However, information on planktonic dinoflagellates is widely available, but is often scattered in rare literary sources and inaccessible outside Russia. Since the early works by MERESCHKOWSKY (1878) and CENKOVSKII (1881), all the works dealing with dinoflagellates or phytoplankton in the Arctic have been taken into account. The present study is the first checklist of dinoflagellates found in the Russian Arctic ever published. The only book which generalized knowledge on dinoflagellates, both marine and freshwater, from the seas and continental reservoirs of the former Soviet Union including Arctic seas was published long ago (KISELEV 1950). Another work worth mentioning is that by MEUNIER (1910), who described many new species and gave illustrations of them. Localities were not always determined exactly,

but obviously were the eastern Barents Sea or the western Kara Sea, near Novaya Zemlya.

The materials collected in 1905 and 1906 during the cruises of the steamer *Andrej Pervozvannyj* and the sailing vessel *Rybak* are treated in LINKO (1907, 1912, 1915) and BREITFUSS (1915), but the real author of all of phytoplankton species identifications is ELENKIN. In addition, ELENKIN contributed to the zoological journals during the same cruises with his identifications which were composed from the station lists of zoo- and phytoplanktonic organisms. Although the authorship of the journals is not designated in publications, here, by convention, these contributions are cited as ELENKIN & LINKO (1912, 1915). Similarly, in VIRKETIS (1957) dinoflagellates were identified by KISELEV, and in GOGOREV (1994) some dinoflagellate species were identified by OKOLODKOV.

HENCKEL (1925) described seven new species, *Peridinium quadricorne*, *P. diplopsaloides*, *P. sibiricum*, *P. karianum*, *P. toali*, *P. seebergii* and *Goniodoma gobbii*, and a new variety *Peridinium cerasus* f. *kariana* from the Kara Sea. Henckel's poor comments in Latin cannot be considered descriptions or diagnoses. The taxa are accompanied with very schematic drawings which are not satisfactory for dinoflagellate identifications even to the generic level. ZABELINA (1930) was very sceptical of the new species described by HENCKEL (1925).

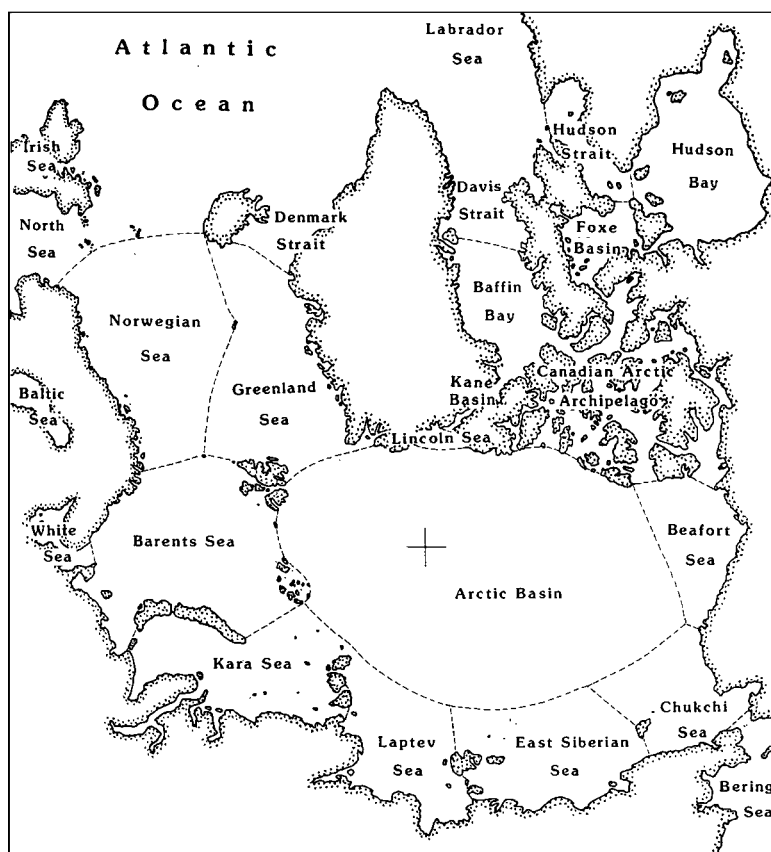


Fig. 1. Map of the Arctic Ocean to show the locations of the areas.

Goniadoma gobii probably belongs to the genus *Gonyaulax* and the *Peridinium* species are members of the genus *Protoperidinium*. Since the boundaries between thecal plates are not indicated, one can hardly ascribe the new taxa to a certain sub-genus or group within genus. As a result, Henckel's new taxa are not included in the present list.

The present study was partly inspired by the work by HSIAO (1983), who brought together all previous records of marine phytoplankton and sea-ice microalgae from the Canadian Arctic. The main aim of the present

study was to unite all the available data on the species composition of planktonic dinoflagellates for the Barents, White, Laptev, East Siberian and Chukchi seas as well as for the Arctic Basin. The data on the occurrences of dinoflagellates in the American economical zone of the Chukchi Sea (OKOLODKOV 1986) and in the Norwegian zone of the Barents Sea published by Russian authors are also included in the present list. The works by Norwegian authors on the western Barents Sea and those by Canadian and Japanese scientists on the Chukchi Sea are excluded (BRAARUD 1935; BURSA 1963; THRONDSSEN 1970; SAITO 1974; SAITO & TANIGUCHI 1978). Unlike the Ph.D. theses by OKOLODKOV (1986) and RYZHOV (1988), the other theses on the Arctic phytoplankton, in particular, on the phytoplankton of the White and Barents seas are not treated in the present paper. The data on the dinoflagellate species composition relevant to them

have been almost fully published elsewhere.

The objective of the present paper is to bring together all records of dinoflagellates from the Russian Arctic, considering new nomenclatural and taxonomical changes.

RESULTS

Classification of the orders and families follows FENSOME & al. (1993). The genera *Micracanthodinium* (LOHMANN) DEFLANDRE and *Peridiniella* KOFOID ET MICHENER were placed according to DODGE (1995) and OKOLODKOV &

Table 1. The numbers of dinoflagellate species in the Russian Arctic seas and Arctic Basin.

Order	Bar	Whi	Kara	Lap	ESib	Chu	ABas	Russian Arctic
Gymnodiniales	34	20	20	-	2	13	-	41
Gonyaulacales	30	15	17	8	1	13	2	33
Peridinales	57	38	52	28	8	44	9	86
Dinophysiales	14	9	13	5	2	7	-	19
Prorocentrales	5	3	2	-	-	1	-	8
Phytodinales	-	1	-	-	-	-	-	1
Blastodinales	-	-	-	-	-	1	-	1
In total	140	86	104	41	13	79	11	189

DODGE (1995), respectively. Genera are ordered alphabetically within each family and species within each genus. Records identified only to genus are included in the list as well. This list does not pretend to be and cannot be critical in a strict sense. Most of identifications cannot be checked because relevant collections have not been stored and illustrations are very rare in Russian literature on the taxonomy and ecology of dinoflagellates recorded from the Arctic. Some authors compiled their lists of species from literature. As a result, in some cases the present list gives a deceptive impression that some species have been found repeatedly, while they were observed only once or a few times.

Latin names of the taxa are updated, with the names in the original sources, if different. If wrong, the authorship in synonyms and spelling mistakes in specific names are corrected, without changing the author's interpretation. If the authorship was missing, it was added (the authorship was clear in all cases). Sometimes, the same surnames have various orthography, e.g. Kiselev, Kiselew, Kisselew or Usachev, Usachev; they were not brought to the same form. The word combination 'also as' in brackets, before a synonymic name means that in the original literature the name was given along with the valid name adopted in the present list. The works where the species are illustrated are marked with an asterisk (*). The numbers in parentheses following a name in the list refer to explanatory notes at the end of the checklist.

Geographic names are abbreviated as follows: the Barents Sea – Bar, the White Sea – Whi, the Kara Sea – Kara, the Laptev Sea – Lap, the East Siberian Sea – ESib, the Chukchi Sea – Chu, the Arctic Basin – ABas. The localities are given in Fig. 1.

Dinoflagellates recorded from the Russian Arctic comprise 189 species, not taking into account the taxa identified to genus. The taxonomical composition of dinoflagellate flora in each sea and the Arctic Basin is given in Table 1.

Dinoflagellata
Dinophyceae
Gymnodiniales
Gymnodiniaceae

Amphidinium Claparède et Lachmann, 1859

Amphidinium arcticum (1)

Ryzhov 1988a (Bar)

A. crassum Lohmann, 1908

Zhitina 1981a, b (Whi); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Okolodkov 1986 (as *A. phaecysticola* Lebour; Chu); Sarukhan-Bek & al. 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara)

A. extensum Wulff, 1919

*Wulff 1919 (Bar); Roukhijainen 1966 (Bar); Usachev 1968 (Kara); Barabasheva & al. 1979 (Whi); Zhitina 1981a, 1982 (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov & al. 1984 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Sarukhan-Bek & al. 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)

A. longum Lohmann, 1908

Wulff 1919 (Bar); Kiselev 1939 (Whi); Zhitina 1982 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara)

A. sphenoides Wulff, 1919 (2)

*Wulff 1919 (Bar); Roukhijainen 1962, 1966 (Bar); Ryzhov 1978 (Bar); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Sarukhan-Bek & al. 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara); Okolodkov 1996d, 1998 (Bar)

Amphidinium sp.

Usachev 1935 (Bar); Sokolova 1972 (Bar); Likhacheva 1991 (Whi); Makarevich & al. 1991 (Bar); Okolodkov 1998 (Bar)

Cochlodinium Schütt, 1896

Cochlodinium archimedes (Pouchet) Lemmermann, 1899

Derjugin 1915 (Bar); Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)

C. brandtii Wulff, 1919

*Wulff 1919 (Bar); Roukhijainen 1966 (Bar); Zhitina 1981a (Whi); Makarevich & Larionov 1992 (Bar)

C. geminatum (Schütt) Schütt, 1896

*Wulff 1919 (Bar); Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)

Cochlodinium sp.

Iljash & Koltsova 1981 (Kara); Likhacheva 1991 (Whi); Okolodkov 1998 (Bar)

Gymnodinium Stein, 1878

Gymnodinium arcticum Wulff, 1919 (3)

*Wulff 1919 (Bar); Kiselev 1925, 1939 (Whi); Usachev 1935 (Bar), 1968 (Kara); Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Ryzhov 1978, 1985, 1988a, 1994 (Bar); Barabasheva & al. 1979 (Whi); Zhitina 1981a, b, 1982, 1986 (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983

- (Whi); Ryzhov & al. 1984 (Chu); Okolodkov 1986 (Chu), 1988b (ESib); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Sarukhan-Bek & al. 1991 (Whi); Makarevich & al. 1991, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar)
- G. endofasciculum* Campbell, 1973
Okolodkov 1998 (Bar)
- G. fusus* Schütt, 1895
Koltsova & Iljash 1982 (Kara); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Druzhkov 1994 (Kara)
- G. gracile* Bergh, 1881
Derjugin 1915 (Bar); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara)
- G. heterostriatum* Kofoid et Swezy, 1921
Derjugin 1915 (as *G. rhomboides*; Bar); Roukhijainen 1966 (as *G. rhomboides*; Bar); Makarevich & Larionov 1992 (as *G. rhomboides*; Bar)
- G. lohmannii* Paulsen, 1908
*Wulff 1919 (Bar); Usachev 1935 (Whi); Roukhijainen 1962, 1966 (Bar); Makarevich & Larionov 1992 (Bar)
- G. aff. paulsenii* Schiller, 1928
Vejko 1990 (Whi)
- G. pseudonctiluca* Pouchet, 1885 (4)
Makarevich & Druzhkov 1994 (Kara)
- G. cf. punctatum* Pouchet, 1887 (5)
Okolodkov 1989, 1992, 1993a, 1996a (ESib); Okolodkov & Dodge 1996 (ESib)
- G. simplex* (Lohmann) Kofoid et Swezy, 1921
*Wiktor & Okolodkov 1995 (Bar)
- G. vestificii* Schütt, 1895 (6)
*Wulff 1919 (Bar); Kiselev 1939 (Whi); Semina & Sergeeva 1983 (Whi); Makarevich & Larionov 1992 (Bar)
- G. wulffii* Schiller, 1933 (7)
Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Ryzhov 1978, 1985, 1987, 1988a (Bar); Barabasheva & al. 1979; Zhitina 1981a, b, 1982 (Whi); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu), 1998 (cf. *wulffii*; Bar); Likhacheva 1991 (Whi); Sarukhan-Bek & al. 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & al. 1991, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar)
- Gymnodinium* sp.
Schulz & Wulff 1927 (Bar); Zhitina 1981a (Whi); Ryzhov 1990 (Bar); Makarevich & al. 1991 (Bar); Okolodkov 1993b, 1996c, 1998 (Bar)
- Gyrodinium* Kofoid et Swezy, 1921
- Gyrodinium* cf. *aureolum* Hulburt, 1957
Okolodkov 1996d (Bar)
- G. cf. calyptoglyphe* Lebour, 1925
Okolodkov 1996d (Bar)
- G. corallinum* Kofoid et Swezy, 1921 (8)
Okolodkov 1986 (Chu)
- G. fissum* (Levander) Kofoid et Swezy, 1921
Kiselev 1939 (Whi); Semina & Sergeeva 1983 (Whi)
- G. fusus* (Meunier) Akselman, 1985 (9)
*Meunier 1910 (as *Spirodinium fusus* sp. n.; Bar, Kara); Roukhijainen 1966 (Bar); Zhitina 1981a, b, 1982, 1986 (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov & al. 1984 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Makarevich 1996 (Bar); Okolodkov 1996d, 1998 (cf. *fusus*; Bar)
- G. grave* (Meunier) Kofoid et Swezy, 1921
*Meunier 1910 (as *Spirodinium grave* sp. n.; Bar, Kara); Makarevich & Larionov 1992 (Bar)
- G. hyalinum* (Schilling) Kofoid et Swezy, 1921
Likhacheva 1991 (Whi)
- G. lachryma* (Meunier) Kofoid et Swezy, 1921
*Meunier 1910 (as *Spirodinium lachryma* sp. n.; Kara); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Vasjutina 1991 (Bar); Larionov 1992, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Makarevich 1996 (Bar); Okolodkov 1998 (Bar)
- G. nasutum* (Wulff) Schiller, 1933
*Wulff 1919 (as *Spirodinium nasutum* n. sp.; Bar); Roukhijainen 1966 (Bar); Ryzhov 1988a (Bar); Koltsova & Iljash 1982 (Kara); Okolodkov 1986 (Chu); Makarevich & Koltsova 1989 (Kara); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar)

- G. ochraceum* Kofoid et Swezy, 1921 (10)
Okolodkov 1986 (Chu)
- G. pellucidum* (Wulff) Schiller, 1933
*Wulff 1919 (as *Gymnodinium pellucidum* n. sp.; Bar); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara); Okolodkov 1998 (Bar)
- G. pingue* (Schütt) Kofoid et Swezy, 1921
*Wulff 1919 (as *Spirodinium varians* n. sp.; Bar); Roukhijainen 1966 (Bar); Zhitina 1981a, b, 1982 (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Sarukhan-Bek & al. 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)
- G. prunus* (Wulff) Lebour, 1925
*Wulff 1919 (as *Spirodinium prunus* n. sp.; Bar); Roukhijainen 1966 (Bar); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Sarukhan-Bek & al. 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Makarevich 1996 (Bar)
- G. spirale* (Bergh) Kofoid et Swezy, 1921
Derjugin 1915 (as *Spirodinium spirale*; Bar); *Wulff 1919 (as *S. maximum* sp. n.; Bar); Roukhijainen 1966 (Bar); *Okolodkov 1986 (Chu), 1996d, 1998 (Bar); Ryzhov 1988a (Bar); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar); *Wiktor & Okolodkov 1995 (Bar)
- G. varians* (Wulff) Schiller, 1933
*Wulff 1919 (as *Spirodinium varians* sp. n.; Bar); Roukhijainen 1966 (Bar); Zhitina 1981a, 1982 (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov & al. 1984 (Chu); Makarevich & Koltsova 1989 (Kara); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)
- G. wulffii* Schiller, 1933
*Wulff 1919 (as *Spirodinium schutti* Lemmermann; Bar); Roukhijainen 1966 (Bar); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov & al. 1984 (Chu); Ryzhov 1985, 1988a, 1990 (Bar); Makarevich & Koltsova 1989 (Kara); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar)
- Gyrodinium* sp.
Kamshilov & al. 1958 (Bar); Zhitina 1981a (Whi); Okolodkov 1998 (Bar)
- Katodinium* Fott, 1957
- Katodinium glaucum* (Lebour) Loeblich III, 1965
Okolodkov 1998 (Bar)
- Katodinium* sp.
Okolodkov 1996d (Bar)
- Paulsenella* Chatton, 1920
- Paulsenella chaetoceratis* (Paulsen) Chatton, 1920 (11)
Okolodkov 1986, 1988a (Chu), 1996d (Bar)
- Torodinium* Kofoid et Swezy, 1921
- T. teredo* (Pouchet) Kofoid et Swezy, 1921
Derjugin 1915 (as *Gymnodinium teredo*; Bar); Makarevich & Larionov 1992 (as *G. teredo*; Bar)
- Warnowiaceae
- Warnowia* Lindemann, 1928
- Warnowia schueti* (Kofoid et Swezy) Schiller, 1933
Derjugin 1915 (as *Pouchetia rosea*; Bar); Roukhijainen 1966 (as *Warnowia Schutti*; Bar); Makarevich & Larionov 1992 (Bar)
- Warnowia* sp.
*Wulff 1919 (*Pouchetia* sp.; Bar); Roukhijainen 1966 (Bar)
- Actiniscaceae
- Actiniscus* (Ehrenberg) Ehrenberg, 1843
- Actiniscus pentasterias* (Ehrenberg) Ehrenberg, 1854 (12)
*Meunier 1910 (as *Gymnaster striatum* sp. n. and *G. helix* sp. n.; Bar or Kara); Makarevich & Larionov 1992 (as *G. striatum*; Bar); Makarevich & al. 1993 (as *Gymnaster striatum* Meunier; Bar); *Okolodkov 1986 (Chu)
- Gonyaulacales
Cladopyxiaceae
- Micracanthodinium* (Lohmann) Deflandre, 1937
- M. claytonii* (Holmes) Dodge, 1985
Okolodkov 1998 (Bar)
- Peridiniella* Kofoid et Michener, 1911
- Peridiniella catenata* (Levander) Balech, 1977 (13)
*Meunier 1910 (as *Amylax catenata*; Bar, Kara); Zabelina 1930, 1946 (Kara); Kiselev 1935a (Kara), 1937 (Chu), 1939 (Whi); Usachev 1935 (Bar), 1946 (ABas), 1968 (Kara); Shirshov 1937 (ESib, Lap,

- Chu); Kiselev 1950 (Whi, Lap); Roukhijainen 1966 (Bar); Kokin & al. 1970 (Whi); Koltsova 1971 (Whi); Khlebovich 1974 (Whi); Barabasheva & al. 1979 (Whi); Iljash & Koltsova 1981 (Kara); Koltsova & Iljash 1982 (Kara, Lap); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu), 1988b (ESib), 1996b (Chu, Lap, Kara, Bar, Whi), 1996c (Lap, Kara), 1998 (Bar); Galkina & al. 1988 (Whi); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Mikhailovsky & Zhitina 1989; Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara); Makarevich 1995 (Kara); *Wiktor & Okolodkov 1995 (Bar); Gogorev & Okolodkov 1996 (Chu); Okolodkov & Dodge 1996 (Kara, Lap)
- Peridiniella danica* (Paulsen) Okolodkov et Dodge, 1995 (14)
 *Meunier 1910 (Bar); Kiselev 1925, 1939 (Whi); Usachev 1935 (Bar), 1968 (Kara); Roukhijainen 1966 (Bar); Zhitina 1981a (Whi); Semina & Sergeeva 1983 (Whi); Ryzhov 1988a, b (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Okolodkov 1996d, 1998 (Bar)
- Gonyaulacaceae
- Amylax* Meunier, 1910
- Amylax triacantha* (Jørgensen) Soumia, 1984 (15)
 Linko 1907, 1912 (Bar); *Meunier 1910 (as *A. lata* sp. n.; Kara); Derjugin 1915 (Bar); *Kiselev 1928 (f. *minor* n. f.; Bar), 1937 (Chu), 1950 (Lap); Zabelina 1930, 1946 (Kara); Shirshov 1937 (Chu, Lap); Roukhijainen 1966 (Bar); Usachev 1968 (Kara); Barabasheva & al. 1979 (Whi); Zhitina 1981a (Whi); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara); *Wiktor & Okolodkov 1995 (Bar); Makarevich 1996 (Bar); Okolodkov 1996c (Kara, Bar), 1998 (Bar); Okolodkov & Dodge 1996 (Chu, Lap, Kara, Bar, Whi)
- Gonyaulax* Diesing, 1856
- Gonyaulax alaskensis* Kofoid, 1911
 Kiselev 1937 (Chu); Ryzhov & al. 1984 (Chu); Ryzhov 1988a (Bar)
- G. apiculata* (Pénard) Entz, 1904 (16)
 Ryzhov 1988a (Bar)
- G. cochlea* Meunier, 1909
 Roukhijainen 1966 (Bar); Barabasheva & al. 1979 (Whi); Zhitina 1981a (Whi); Okolodkov 1986 (Chu); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Bar); Makarevich 1996 (Bar)
- G. diegensis* Kofoid, 1911
 Shirshov 1937 (Chu, Lap); Okolodkov 1986 (Chu); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Ryzhov 1988a (Bar); Makarevich & al. 1991 (Bar); Makarevich & Larionov 1992 (Bar); *Wiktor & Okolodkov 1995 (Bar)
- G. digitalis* (Pouchet) Kofoid, 1911
 Usachev 1935 (Bar), 1968 (Kara); Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Ryzhov 1988a (Bar); Barabasheva & al. 1979 (Whi); Zhitina 1981a, 1982 (Whi); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)
- G. fragilis* (Schütt) Kofoid, 1911
 *Wulff 1919 (as *Steimiella fragilis*; Bar); Roukhijainen 1966 (Bar); Ryzhov 1988a (Bar); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara)
- G. nivicola* (Meunier) Kofoid, 1924 (17)
 *Meunier 1910 (as *Amylax nivicola*; Bar)
- G. perpusilla* (Meunier) Kofoid, 1911 (18)
 *Meunier 1910 (Bar, Kara); Makarevich & Druzhkov 1994 (Kara)
- G. polygramma* Stein, 1883
 *Meunier 1910 (Bar); Kiselev 1939 (Whi); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara); Makarevich 1996 (Bar)
- G. spinifera* (Claparède et Lachmann) Diesing, 1866
 Linko 1907 (Bar); Breitfuss 1915 (Bar); Derjugin 1915 (Bar); Elenkin & Linko 1915 (Bar); Levander 1916 (also as *G. levanderi*; Whi); Kiselev 1925 (Whi), 1928 (Bar), 1937 (Chu), 1939 (Whi); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1968 (Kara); Shirshov 1937 (Chu, Lap); Gostilovskaya 1948 (Whi); Kamshilov & al. 1958 (Bar); Roukhijainen 1962, 1966 (Bar); Sokolova 1972 (Bar); Zhitina 1981a (Whi); Semina & Sergeeva 1983 (Whi); Okolodkov 1986 (Chu), 1998 (Bar); Ryzhov 1988a

(Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Sergeeva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara, Bar)

Gonyaulax sp.

Shirshov 1937 (Chu); Sergeeva 1991 (Whi); Okolodkov 1996c (Bar)

Lingulodinium Wall, 1967 emend. Dodge, 1989

Lingulodinium polyedra (Stein) Dodge, 1989 (19)

Elenkin & Linko 1915 (as *Goniodoma acuminatum*; Bar); Usachev 1968 (Kara); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (as *Goniodoma acuminatum* Stein; Bar); Makarevich & Druzhkov 1994 (Kara)

Protoceratium Bergh, 1881

Protoceratium reticulatum (Claparède et Lachmann)

Bütschli, 1885

Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (Bar); Elenkin & Linko 1912, 1915 (Bar); Breitfuss 1915 (Bar); Levander 1916 (Whi); Kiselev 1925 (Whi), 1928 (Bar), 1937 (Chu), 1939 (Whi); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1968 (Kara); Zabelina 1946 (Kara); Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Barabasheva & al. 1979 (Whi); Zhitina 1981a, 1982 (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov & al. 1984 (Chu); Okolodkov 1986 (as *Gonyaulax grindleyi* Reinecke; Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Vasjutina 1991 (Bar); Larionov 1992, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (as *Gonyaulax grindleyi*; Kara); Gogorev 1995 (Whi); *Wiktor & Okolodkov 1995 (Bar)

P. splendens Meunier, 1910 (20)

*Meunier 1910 (Kara)

Ceratiaceae

Ceratium Schrank, 1793

Ceratium arcticum (Ehrenberg) Cleve, 1901 (21)

Palibin 1903-1906 (Bar); Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (as *C. longipes* var. *arctica*; Bar, Kara); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Breitfuss 1915 (Bar); Derjugin 1915 (Bar); Kiselev 1925 (Whi), 1928 (Bar), 1930 (Whi), 1935a (Kara), 1937 (Chu), 1939, 1957 (Whi); Wulff 1927, 1929 (Bar); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); *Usachev 1935 (as *C. arcticum* typ. A1, A2, A3, *C. arcticum* f. *gracilis*, *C. arcticum* var. *curvicornis* n. var., *C. arcticum* f. *gracilis*, *C.*

arcticum var. *ventricosum*, *C. arcticum*-*longipes*; Bar), 1968 (type form + var. *curvicornis* Usachev + var. *ventricosum* (Ostenfeld) Usachev; Kara); Shirshov 1937 (Chu, Lap); Gostilovskaya 1948 (Whi); Virketis 1957 (ABas); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Kokin & al. 1970 (Whi); Koltsova 1971 (Whi); Sokolova 1972 (Bar); Khlebovich 1974 (Whi); Ryzhov 1978, 1987, 1988a, 1994 (Bar); Barabasheva & al. 1979 (Whi); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); *Sergeeva 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Okolodkov 1993c ((var. *arcticum*, var. *longipes*, var. *ventricosum*; Bar), 1996b (var. *arcticum*: ABas, Chu, Lap, Kara, Bar, Whi; var. *longipes*: Chu, Bar, Whi), 1996c (var. *arcticum*, var. *longipes*, var. *ventricosum*; Bar), 1996d (Bar), 1998 (var. *arcticum*; Bar); Gogorev 1994 (Lap), 1995 (Whi); Makarevich & Druzhkov 1994 (Kara, Bar); Gogorev & Okolodkov 1996 (Chu); Larionov 1995 (Bar); Makarevich 1995 (Kara); *Wiktor & Okolodkov 1995 (var. *longipes*; Bar); Okolodkov & Dodge 1996 (Chu, Kara, Bar, Whi)

C. arietinum Cleve, 1900

Linko 1907, 1912, 1915 (as *C. bucephalum* Cleve; Bar); Elenkin & Linko 1912, 1915 (as *C. bucephalum*; Bar); Derjugin 1915 (as *C. bucephalum*; Bar); Kiselev 1928 (as *C. bucephalum*; Bar); Wulff 1929 (as *C. bucephalum*; Bar); Usachev 1935 (as *C. bucephalum*; Bar); Kamshilov & al. 1958 (as *C. bucephalum*; Bar); Roukhijainen 1966 (as *C. bucephalum*; Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (as *C. bucephalum*; Bar); Makarevich & Druzhkov 1994 (Bar); *Wiktor & Okolodkov 1995 (var. *bucephalum*; Bar); Okolodkov 1996c (var. *bucephalum*; Bar)

C. compressum Gran, 1902 (22)

Elenkin & Linko 1915 (+ f. *divergens* Elenkin; Bar); Linko 1915 (Bar); Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)

C. furca (Ehrenberg) Claparède et Lachmann, 1859

Linko 1907, 1912, 1915 (Bar); Elenkin & Linko 1912, 1915 (Bar); Wulff 1927, 1929 (Bar); Kiselev 1928 (Bar); Usachev 1935 (Bar); Kamshilov & al. 1958 (Bar); Ryzhov & al. 1984 (var. *berghii*; Chu); Ryzhov 1987, 1988a, 1994 (Bar); Makarevich & Larionov 1992 (Bar); Okolodkov 1993c, 1996c (var. *furca*; Bar); Makarevich & Druzhkov 1994 (Bar); *Wiktor & Okolodkov 1995 (var. *furca*; Bar)

C. fusus (Ehrenberg) Dujardin, 1841

Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (Bar, Kara); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Breiffuss 1915 (Bar); Derjugin 1915 (Bar); Levander 1916 (Whi); Kiselev 1925 (Whi), 1928 (Bar), 1930 (Whi), 1939 (Whi); Wulff 1927, 1929 (Bar); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1968 (Kara); Gostilovskaya 1948 (Whi); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Kokin & al. 1970 (Whi); Koltsova 1971 (Whi); Khlebovich 1974 (Whi); Ryzhov 1978, 1985, 1987, 1988a, b, 1990 (Bar); Barabasheva & al. 1979 (Whi); Zhitina 1981a, b, 1982 (Whi); Fedorov & al. 1982 (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); *Okolodkov 1986 (Chu), 1996c (var. *fuscus*; Bar); Galkina & al. 1988 (Whi); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Sergeeva 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Okolodkov 1993c (var. *fuscus*; Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Gogorev 1995 (Whi); *Wiktor & Okolodkov 1995 (var. *fuscus*; Bar); Gogorev & Okolodkov 1996 (Chu); Makarevich 1996 (Bar)

C. hirundinella (O.F.Müller) Dujardin, 1841 (23)

Levander 1916 (Whi); Kiselev 1932 (Lap), 1939 (Whi); Okolodkov 1996c (Bar)

C. horridum (Cleve) Gran, 1902

Linko 1907, 1912 (Bar); Elenkin & Linko 1912, 1915 (Bar); Derjugin 1915 (Bar); Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar); Okolodkov 1993c, 1996c (var. *horridum*; Bar); Makarevich & Druzhkov 1994 (Bar); *Wiktor & Okolodkov 1995 (var. *horridum*; Bar)

C. lineatum (Ehrenberg) Cleve, 1899

Elenkin & Linko 1912 (Bar); Linko 1912 (Bar); Usachev 1935 (Bar); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Ryzhov 1987, 1988a, b (Bar); Likhacheva 1991 (Whi); Makarevich & al. 1991, 1993 (Bar); Makarevich & Larionov 1992 (Bar); *Okolodkov 1993c, 1996c (Bar); Makarevich & Druzhkov 1994 (Bar); *Wiktor & Okolodkov 1995 (Bar)

C. longipes (Bailey) Gran, 1902 (24)

Palibin 1903-1906 (Bar); Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (var. *Baltica*?, var. *oceanica*?, var. *ventricosa*; Bar, Kara); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Breiffuss 1915 (Bar); Levander 1916 (Whi); Derjugin 1915 (Bar); *Henckel 1925 (Kara); Kiselev 1925 (Whi), 1928 (Bar), 1935a (Kara), 1937 (Chu), 1939 (Whi);

Wulff 1927, 1929 (Bar); Zabelina 1930, 1946

(Kara); Virketis & Kiselev 1933 (Bar); *Usachev 1935 (as *C. longipes* typ. IA, IB, IC, IIA, IIB, IIC, *C. longipes-arcticum*, *C. longipes* var. *balticum*, *C. longipes* var. *balticum* f. *minor*, *C. longipes* f. *minor*; Bar); Shirshov 1937 (Chu, Lap); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Kokin & al. 1970 (Whi); Koltsova 1971 (Whi); Sokolova 1972 (Bar); Ryzhov 1978, 1985, 1987, 1988a, b, 1990 (Bar); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu); Galkina & al. 1988 (Whi); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & al. 1991, 1993 (Bar); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Makarevich 1996 (Bar); *C. macroceros* (Ehrenberg) Vanhöffen, 1897; Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (as *C. longipes* var. *ampulata* var. n.; Bar or Kara); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Derjugin 1915 (Bar); Wulff 1927, 1929 (Bar); Kiselev 1928 (Bar); Usachev 1935 (Bar); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Ryzhov 1987, 1988a, b (Bar); Makarevich & al. 1991, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Okolodkov 1993c, 1996c (var. *macroceros*; Bar); Makarevich & Druzhkov 1994 (Bar); *Wiktor & Okolodkov 1995 (var. *macroceros*; Bar)

C. pentagonum Gourret, 1883

Ryzhov & al. 1984 (f. *robustum*; Chu); *Okolodkov 1986 (Chu); Gogorev & Okolodkov 1996 (Chu)

C. tripos (O.F. Müller) Nitzsch, 1817

Linko 1907, 1912, 1915 (Bar); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Derjugin 1915 (Bar); Wulff 1927, 1929 (Bar); Kiselev 1928 (Bar); Usachev 1935 (var. *atlantica*, var. *baltica*, var. *baltica* f. *hiemale*); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (type form + var. *atlanticum*, var. *balticum*, var. *balticum* f. *hiemale*; Bar); Okolodkov 1993c, 1996c (var. *atlanticum*; Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (var. *atlanticum*; Bar)

Ceratium sp.

Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Makarevich & al. 1991 (Bar)

Goniodomaceae

Alexandrium Halim, 1960

Alexandrium ostenfeldii (Paulsen) Balech et Tangen, 1985 (25)

- Kiselev 1925 (Whi), 1937 (Chu), 1939 (Whi), 1950 (Lap); Zabelina 1930, 1946 (Kara); Usachev 1935 (Bar); Shirshov 1937 (Chu, Lap); Zabelina 1946 (Kara); Gostilovskaya 1948 (Whi); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); *Okolodkov 1986 (Chu), 1996c (Chu, Lap); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Okolodkov & Dodge 1996 (Chu, Lap, Kara, Bar, Whi)
- Alexandrium tamarense* (Lebour) Balech, 1985 (26) Kamshilov & al. 1958 (Bar); Roukhijainen 1962, 1966 (Bar); Ryzhov 1988a (Bar); Makarevich & Larionov 1992 (Bar)
- Helgolandinium* von Stosch, 1969
- Helgolandinium subglobosum* von Stosch, 1969
*Wiktor & Okolodkov 1995 (Bar)
- Pyrophacus* Stein, 1883
- Pyrophacus horologium* Stein, 1883 emend. Wall et Dale, 1971
Levander 1916 (Whi); Kiselev 1939 (Whi); Semina & Sergeeva 1983 (Whi)
- Peridiniales
Heterocapsaceae
- Heterocapsa* Stein, 1883
- Heterocapsa rotundata* (Lohmann) Hansen, 1995
*Wulff 1919 (as *Amphidinium rotundatum* Lohmann; Bar); Kiselev 1950 (as *Massartia rotundata* Schiller, Whi); Roukhijainen 1966 (as *M. rotundata*; Bar); Ryzhov 1988a (as *M. rotundata*; Bar); Makarevich & Larionov 1992 (as *M. rotundata*; Bar); *Wiktor & Okolodkov 1995 (as *Katodinium rotundatum* (Lohmann) Loeblich III; Bar); Okolodkov 1996d, 1998 (Bar)
- H. triquetra* (Ehrenberg) Stein, 1883
*Meunier 1910 (Bar); Derjugin 1915 (Bar); Elenkin & Linko 1915 (Bar); Linko 1915 (Kara); Kiselev 1928 (Bar), 1939 (as *Peridinium triquetra* Lebour; Whi); *Zabelina 1946 (as *Peridinium triquetrum*; Kara); Gostilovskaya 1948 (as *Peridinium triquetrum*; Whi); Roukhijainen 1962, 1966 (as *Glenodinium triquetrum* Ehrenberg; Bar); Usachev 1968 (Kara); Iljash & Koltsova 1981 (Kara); Koltsova & Iljash 1982 (as *Peridinium triquetrum*; Kara, Lap); Semina & Sergeeva 1983 (Whi); *Okolodkov 1986 (Chu); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (as *Peridinium triquetrum*; Whi); Makarevich & Larionov 1992 (as *Peridinium triquetrum*; Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara); *Wiktor & Okolodkov 1995 (Bar)
- Glenodiniaceae
- Glenodinium* Ehrenberg, 1836
- Glenodinium gymnodinium* Pénard, 1891 (27)
Likhacheva 1991 (Whi); Okolodkov 1986 (Chu)
- G. inflatum* Meunier, 1910
*Meunier 1910 (Bar, Kara); Ryzhov 1988a (Bar); Makarevich & Druzhkov 1994 (Kara)
- G. paululum* Lindemann, 1928
Makarevich & Koltsova 1989 (Kara); Makarevich & Druzhkov 1994 (Kara)
- G. pilula* (Ostenfeld) Schiller, 1937
Kiselev 1939 (as *Diplopsalis pilula*; Whi); Semina & Sergeeva 1983 (Whi)
- Glenodinium* sp.
Kiselev 1928 (Bar); Makarevich & al. 1991 (Bar); Sergeeva 1991 (Whi)
- Peridiniaceae
- Peridinium* Ehrenberg, 1830
- Peridinium africanum* Lemmermann, 1907 (28)
Kiselev 1957 (tab. *remotum* var. *tatricum* (Woloska) nov. nom. f. *mezeniense* f. n.; Whi); *Kiselev 1960 (var. *tatricum* (Wolosz.) Kiselev f. *mezeniense* Kiselev f. nova; Whi); Likhacheva 1991 (Whi); Semina & Sergeeva 1983 (Whi)
- P. anceps* Meunier, 1910 (29)
*Meunier 1910 (Bar)
- P. belgicum* Wulff, 1919 (30)
*Wulff 1919 (Bar); Usachev 1935 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (as *Protoperidinium belgicum* (Wulff) Balech; Bar)
- P. bipes* Stein, 1883 (31)
Likhacheva 1991 (Whi)
- P. cinctum* Ehrenberg, 1838 (32)
Kiselev 1932 (Lap)
- P. gracile* Meunier, 1910 (33)
*Meunier 1910 (Bar); Zabelina 1946 (Kara); Kiselev 1950 (Chu); Ryzhov & al. 1984 (Chu); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (as *P. gracile* Gran et Braarud; Kara)
- P. granisparsum* Meunier, 1910 (34)
*Meunier 1910 (Bar); Makarevich & Larionov 1992 (Bar)

- P. gravidum* Meunier, 1910 (35)
 *Meunier 1910 (Bar, Kara); Kiselev 1928 (Bar); Roukhijainen 1966 (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (as *Protoperidinium gravidum* (Meunier) Balech; Kara)
- P. karianum* (Meunier) Schiller, 1937
 *Meunier 1910 (as *Nephrodinium karianum* sp. n.; Kara); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & Druzhkov 1994 (as *Protoperidinium karianum* (Meunier) Balech; Kara)
- P. nivale* (Meunier) Schiller, 1937
 *Meunier 1910 (as *Nephrodinium nivale* sp. n.; Kara); Iljash & Koltsova 1981 (Kara); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & Druzhkov 1994 (as *Protoperidinium nivale* (Meunier) Balech; Kara)
- P. ovaliforme* Kiselev, 1928 (36)
 *Kiselev 1928 (Bar); Makarevich & Larionov 1992 (Bar)
- P. ovatoides* Meunier, 1910 (37)
 *Meunier 1910 (Bar, Kara)
- P. raciborskii* Wotoszyńska, 1912 (38)
 Gogorev 1994 (as *Protoperidinium palustre* (Lindemann) Lefevre; Lap)
- P. rhombus* Meunier, 1910 (39)
 *Meunier 1910 (Bar); Makarevich & Larionov 1992 (Bar)
- P. robustum* Meunier, 1910
 *Meunier 1910 (Bar, Kara); Shirshov 1937 (Lap); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar)
- P. rotundatum* Abé, 1936 (40)
 Gogorev 1994 (Lap)
- P. rubrum* Cenkovskij, 1881 (41)
 *Cenkovskij 1881 (as *Peridinium* (?) *rubrum*, Whi)
- P. sphaericum* Meunier, 1910 (42)
 *Meunier 1910 (Bar, Kara); Zabelina 1930 (Kara); Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)
- P. umbonatum* Stein, 1883 (43)
 Kiselev 1957 (as *P. inconspicuum* Lemmermann; Whi); Semina & Sergeeva 1983 (as *P. inconspicuum*; Whi); Likhacheva 1991 (also as *P. pusillum* (Penard) Lemmermann; Whi)
- Peridinium* sp. (44)
 Elenkin & Linko 1912, 1915 (Bar); Linko 1912 (Bar); *Meunier 1910; Kamshilov & al. 1958 (Bar); Zhitina 1981a, b (Whi); Likhacheva 1991 (Whi); Makarevich & al. 1991 (Bar); Sergeeva 1991 (Whi); Druzhkov & Makarevich 1992 (Bar)
- Scrippsiella* Balech, 1959 ex Loeblich III, 1965
- Scrippsiella trochoidea* (Stein) Steidinger et Balech, 1977
 Elenkin & Linko 1912, 1915 (as *Glenodinium acuminatum*; Bar); Linko 1912 (as *Glenodinium (acuminatum) trochoideum*; Bar); Kiselev 1925 (Whi), 1928 (as *Glenodinium trochoideum*), 1937 (as *Peridinium trochoideum*; Chu), 1939 (as *Peridinium trochoideum*; Whi); Zabelina 1946 (as *Peridinium trochoideum*; Kara); Gostilovskaya 1948 (as *Peridinium trochoideum*; Whi); Roukhijainen 1962, 1966 (as *Glenodinium trochoideum*; Bar); Usachev 1968 (Kara); Sokolova 1972 (as *Peridinium trochoideum*; Bar); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Okolodkov 1986 (Chu), 1996c (Bar); Ryzhov 1988a, b (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Vasjutina 1991 (as *Peridinium trochoideum*; Bar); Druzhkov & Makarevich 1992 (as *Peridinium trochoideum*; Bar); Larionov 1992 (as *Peridinium trochoideum*; Bar), 1993 (as *Protoperidinium trochoideum*; Bar); Makarevich & Larionov 1992 (as *Peridinium trochoideum*; Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Gogorev & Okolodkov 1995 (Chu); *Wiktor & Okolodkov 1995 (Bar); Makarevich 1996 (Bar)
- Congruentidiaceae
- Diplopsalis* Bergh, 1881 (45)
- Diplopsalis acuta* (Apstein) Entz, 1904 (46)
 Usachev 1935 (as *Entzia (Diplopsalis) acuta* Apstein; Whi)
- D. lenticula* Bergh, 1881
 Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (Bar, Kara); Derjugin 1915 (Bar); Elenkin & Linko 1915 (Bar); Kiselev 1925 (Whi), 1928 (Bar), 1937 (Chu), 1939 (Whi); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Usachev 1935 (as *Diplopsalis lenticulata*; Whi), 1968 (as *Glenodinium lenticula* (Bergh) Pouchet; Kara); Shirshov 1937 (Chu, ESib); Gostilovskaya 1948 (as *G. lenticula*; Whi); Roukhijainen 1966 (as *G. lenticulum*; Bar); Sokolova 1972 (as *G. lenticula*; Bar); Zhitina 1981a (as *G. lenticula*; Whi); Koltsova & Iljash 1982 (as *G. lenticulum* type form + f. *globularis* Kisselev); Ryzhov 1988a, b (as *G. lenticulum*; Bar); Makarevich & Koltsova 1989 (as *G. lenticulum*;

- Kara); Likhacheva 1991 (Whi); Sarukhan-Bek & al. 1991 (as *Diplopsalis lenticula* f. *globularis*; Whi); Makarevich & al. 1991, 1993 (as *Glenodinium lenticula*; Bar); Makarevich & Larionov 1992 (Bar); Gogorev 1994 (as *Diplopsalis lenticula* + *D. cf. lenticula* f. *globularis*; Lap); Makarevich & Druzhkov 1994 (as *Glenodinium lenticula*; Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Makarevich 1996 (as *G. lenticula*; Bar); Okolodkov 1996d (Bar)
- D. sphaerica* Meunier, 1910 (47)
*Meunier 1910 (Bar)
- Diplopsalopsis* Meunier, 1910
- Diplopsalopsis bomba* (Stein) Dodge et Toriumi, 1993
Kiselev 1937 (as *Peridiniopsis asymmetrica*; Chu)
- D. orbicularis* (Paulsen) Meunier, 1910
*Meunier 1910 (Bar); Kiselev 1925, 1939 (as *Peridinium orbiculare*; Whi); Roukhijainen 1966 (as *Glenodinium orbiculara*; Bar); Semina & Sergeeva 1983 (as *Peridinium orbiculare*; Whi); Makarevich & Larionov 1992 (as *Peridinium orbiculara*; Bar); Gogorev 1994 (as *Peridinium cf. orbiculare*; Lap)
- Lebouraia* Abé, 1941
- Lebouraia minuta* Abé, 1941 (48)
Okolodkov unp (Chu)
- Oblea* Balech, 1964 ex Loeblich Jr et Loeblich III, 1966
- Oblea rotunda* (Lebour) Balech ex Soumnia, 1973 (49)
Usachev 1935 (as *Peridiniopsis rotunda* Lebour var. *major* nov. var.; Whi); Kiselev 1937 (as *P. rotunda*; Chu); Roukhijainen 1966 (as *Glenodinium rotundum* (Lebour) Schiller; Bar); Makarevich & Larionov 1992 (as *G. rotundum*; Bar); Makarevich & al. 1993 (as *Glenodinium rotundum* (Lebour) Schill.; Bar); Okolodkov unp (Chu)
- Preperidinium* Mangin, 1913
- Preperidinium meunieri* (Pavillard) Elbrächter, 1993
Virketis & Kiselev 1933 (as *Diplopsals lenticula* (Bergh) f. *minor* Paulsen; Bar); Usachev 1935 (as *Diplopeltopsis minor* (Paulsen) Pavillard; Bar); Kiselev 1937 (as *Diplopeltopsis minor*; Chu), 1939 (as *Diplopsalis lenticula* f. *minor*; Whi), 1957 (as *Glenodinium lenticula* (Bergh) Pouchet f. *minor* (Paulsen) Schiller; Whi); Zabelina 1946 (as *Diplopsalis lenticula* f. *minor*; Kara); Gostilovskaya 1948 (as *Glenodinium lenticula*; Whi); Semina & Sergeeva 1983 (as *G. lenticula* var. *minor*; Whi); Okolodkov 1986 (as *Zygabikodinium lenticulatum* (Mangin) Loeblich Jr et Loeblich III; Chu); Sarukhan-Bek & al. 1991 (as *G. lenticula* f. *minor*; Whi); Makarevich & Larionov 1992 (as *G. lenticula* f. *minor*; Bar)
- Protoperidinium* Bergh, 1881
- Protoperidinium achromaticum* (Levander) Balech, 1974 (50)
Levander 1916 (Whi); Kiselev 1925, 1957 (Whi); Shirshov 1938 (ABas); Usachev 1949, 1961 (ABas), 1968 (Kara); Koltsova & Iljash 1982; Semina & Sergeeva 1983 (Whi); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Okolodkov 1998 (cf. *achromaticum*; Bar)
- P. arcticum* (Grøntved et Seidenfaden) Okolodkov, 1997 (51)
*Wiktor & Okolodkov 1995 (as *P. granii*; Bar); Okolodkov 1997b (Chu)
- P. bipes* (Paulsen) Balech, 1974
*Meunier 1910 (as *Glenodinium bipes* Paulsen; Bar); Usachev 1935 (as *Minuscula bipes* Lebour; Bar), 1949, 1961 (as *Peridinium minusculum* Pavillard; ABas), 1968 (as *P. minusculum*; Kara); Shirshov 1937 (as *M. bipes*; Lap), 1938 (as *P. minusculum*; ABas); Zabelina 1946 (as *P. minusculum*; Kara); Kamshilov & al. 1958 (as *P. minusculum*; Bar); Roukhijainen 1962, 1966 (as *P. minusculum*; Bar); Koltsova 1971 (as *P. minusculum*; Whi); Zhitina 1981a, 1986 (as *P. minusculum*; Whi); Koltsova & Iljash 1982 (as *P. minusculum*; Kara, Lap); Ryzhov & al. 1984 (as *P. minusculum*; Chu); *Okolodkov 1986 (Chu), 1996d, 1998 (Bar); Ryzhov 1988a (as *P. minusculum*; Bar); Makarevich & Koltsova 1989 (as *P. minusculum*; Kara); Likhacheva 1991 (as *P. minusculum*; Whi); Sarukhan-Bek & al. 1991 (as *P. minusculum*; Whi); Vasjutina 1991 (as *P. minusculum*; Bar); Larionov 1992 (as *P. minusculum*; Bar); Makarevich & Larionov 1992 (as *P. minusculum*; Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Makarevich 1995 (Kara); *Wiktor & Okolodkov 1995 (Bar)
- P. brevipes* (Paulsen) Balech, 1974 (52)
Kiselev 1925 (Whi), 1937 (Chu), 1939, 1957 (Whi); Zabelina 1930, 1946 (Kara); Usachev 1935 (Bar), 1968 (Kara); Shirshov 1937 (Chu, ESib, Lap); Gostilovskaya 1948 (Whi); Kiselev 1950 (Lap); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Ryzhov 1978, 1988a (Bar); Barabasheva & al. 1979 (Whi); Iljash & Koltsova 1981 (Kara); Zhitina 1981a, b, 1982 (Whi); Koltsova & Iljash 1982 (Kara, Lap); Semina & Sergeeva 1983 (Whi); *Okolodkov 1986 (Chu), 1996c, 1998 (Bar), unp (Lap); Galkina & al. 1988 (Whi); Makarevich & Koltsova 1989 (Kara);

- Likhacheva 1991 (Whi); Vasjutina 1991 (Bar); Larionov 1992, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara, Bar); Larionov 1995 (Bar); Makarevich 1995 (Kara), 1996 (Bar); *Wiktor & Okolodkov 1995 (Bar); Gogorev & Okolodkov 1996 (cf. *brevipes*; Chu)
- P. bulla* (Meunier) Balech, 1974 (53)
 *Meunier 1910 (as *Peridinium bulla* sp. n.; Bar, Kara); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich 1996 (Bar); Druzhkov & Makarevich 1992 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara)
- P. cerasus* (Paulsen) Balech, 1973 (54)
 *Meunier 1910 (Bar, Kara); *Kiselev 1928 (Bar), 1939 (Whi); Zabelina 1930, 1946 (Kara); Usachev 1935 (Bar); Shirshov 1937 (Chu, Lap); Sokolova 1972 (Bar); Larionov 1992 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Bar); Okolodkov 1996d, 1998 (Bar)
- P. conicoides* (Paulsen) Balech, 1974 (55)
 *Meunier 1910 (Bar); Kiselev 1925 (Whi), 1928 (Bar), 1935a (Kara), 1937 (Chu); Zabelina 1930, 1946 (Kara); Shirshov 1937 (Lap, ESib, Chu); Usachev 1968 (Kara); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu), 1996d (Bar); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara); *Wiktor & Okolodkov 1995 (Bar)
- P. conicum* (Gran) Balech, 1974 (56)
 *Meunier 1910 (Bar); Breitfuss 1915 (Bar); Elenkin & Linko 1915 (Bar, Kara); Linko 1915 (Bar); Kiselev 1925 (+ f. *emarginata*?; Whi), 1928 (Bar), 1935a (Kara), 1937 (Chu), 1939 (Whi); Zabelina 1930, 1946 (Kara); Usachev 1935 (Whi, Bar), 1968 (Kara); Shirshov 1937 (Chu, Lap); Gostilovskaya 1948 (Whi); Roukhijainen 1966 (Bar); Zhitina 1981a (Whi); Semina & Sergeeva 1983 (Whi); Okolodkov 1986 (Chu); Galkina & al. 1988 (Whi); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Gogorev 1995 (Whi); *Wiktor & Okolodkov 1995 (Bar)
- P. crassipes* (Kofoid) Balech, 1974
 Kiselev 1928 (Bar); Zabelina 1930 (Kara); Shirshov 1937 (Chu); Usachev 1961 (ABas), 1968 (Kara); Sokolova 1972 (Bar); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara, Bar)
- P. curtipes* (Jørgensen) Balech, 1974
 Usachev 1935 (Bar); Roukhijainen 1966 (Bar)
- P. curvipes* (Ostenfeld) Balech, 1974
 Usachev 1935 (Bar), 1968 (Kara); Kiselev 1937 (Chu); Shirshov 1937 (Chu, Lap); Zabelina 1946 (Kara); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Okolodkov 1986 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & al. 1991 (Bar); Sergeeva 1991 (Whi); Larionov 1992, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar)
- P. decipiens* (Jørgensen) Parke et Dodge, 1976
 Linko 1907 (Bar); *Meunier 1910 (Bar, Kara); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara)
- P. denticulatum* (Gran et Braarud) Balech, 1974
 *Okolodkov 1986 (Chu); Ryzhov 1988a (Bar); Gogorev 1994 (Lap)
- P. depressum* (Bailey) Balech, 1974 (57)
 Palibin 1903-1906 (Bar); Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (as *Peridinium divergens* and *P. divergens* var. *reniforme*; Bar, Kara); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Breitfuss 1915 (Bar); Derjugin 1915 (Bar); Kiselev 1925 (Whi), 1928 (also as *P. parallellum* Broch; Bar), 1935a (Kara), 1937 (Chu), 1957 (Whi); Wulff 1927, 1929 (Bar); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1968 (Kara); Shirshov 1937 (Chu, Lap); Virketis 1957 (ABas); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Ryzhov 1978, 1985, 1987, 1988a, b, 1990, 1994 (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu), 1993c, *d, 1996c (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & al. 1991 (Bar); Sergeeva 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Gogorev 1995 (Whi); Larionov 1995 (Bar); *Wiktor & Okolodkov 1995

- (Bar); Gogorev & Okolodkov 1996 (Chu); Makarevich 1996 (Bar)
- P. divergens* (Ehrenberg) Balech, 1974
Linko 1907, 1912, 1915 (Bar); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Derjugin 1915 (Bar); Kiselev 1925 (Whi), 1928 (Bar), 1935a (Kara); Usachev 1935 (Bar), 1968 (Kara); Roukhijainen 1966 (Bar); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); Ryzhov 1987, 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar)
- P. elongatum* (Meunier) Balech, 1974 (58)
*Meunier 1910 (Bar, Kara); Kiselev 1937 (Chu); Zabelina 1946 (Kara); Usachev 1968 (Kara); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & al. 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)
- P. excentricum* (Paulsen) Balech, 1974
Kiselev 1937 (Chu); Okolodkov 1986 (Chu); Gogorev 1994 (Lap)
- P. globulus* (Stein) Balech, 1974
*Meunier 1910 (Bar, Kara); Kiselev 1937 (Chu); Zabelina 1946; Kamshilov & al. 1958 (Bar); Roukhijainen 1962, 1966 (var. *globulus*; Bar); Usachev 1968 (Kara); Barabasheva & al. 1979 (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov 1988a (Bar); Likhacheva 1991 (Whi); Sergeeva 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); *Wiktor & Okolodkov 1995 (Bar); Makarevich 1996 (Bar)
- P. granii* (Ostenfeld) Balech, 1974
*Meunier 1910 (Bar); Wulff 1929 (Bar); Kiselev 1928 (Bar), 1937 (Chu); Zabelina 1930, 1946 (Kara); Usachev 1935 (Bar), 1968 (Kara); Shirshov 1937 (Chu, Lap); Roukhijainen 1966 (Bar); Ryzhov 1978, 1985, 1987, 1988a, 1994 (Bar); Barabasheva & al. 1979 (Whi); Iljash & Koltsova 1981 (Kara); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara, Lap); Ryzhov & al. 1984 (Chu); Okolodkov 1986 (Chu), 1996c (cf. *granii*; Bar), unp (Lap); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & al. 1991 (Bar); Vasjutina 1991 (Bar); Druzhkov & Makarevich 1992 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara, Bar); Makarevich 1996 (Bar)
- P. grenlandicum* (Wołoszyńska) Balech, 1974 (59)
Makarevich & Druzhkov 1994 (Kara)
- P. hirobis* (Abé) Balech, 1974 (60)
Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)
- P. hyalinum* (Meunier) Balech, 1974
*Meunier 1910 (Bar, Kara); Koltsova & Iljash 1982 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & al. 1991 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)
- P. inclinatum* (Balech) Balech, 1974 (61)
Usachev 1968 (as *P. sphaericum* Okamura; Kara); Makarevich & Koltsova 1989 (as *P. sphaericum* Okamura; Kara)
- P. islandicum* (Paulsen) Balech, 1973
*Meunier 1910 (Bar); Wulff 1927, 1929 (Bar); Kiselev 1928 (Bar); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1961 (ABas), 1968 (Kara); Shirshov 1937 (Lap), 1938 (ABas); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Ryzhov 1978, 1988a (Bar); Koltsova & Iljash 1982 (Kara, Lap); Makarevich & Koltsova 1989 (Kara); Larionov 1992, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Larionov 1995 (Bar); *Wiktor & Okolodkov 1995 (Bar); Okolodkov 1996b (Chu, Lap, Kara, Bar), 1996c, 1998 (Bar)
- P. leonis* (Pavillard) Balech, 1974
Kiselev 1937 (Chu); Usachev 1968 (Kara); Zhitina 1981a (Whi); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Whi); Sergeeva 1991 (Whi); Makarevich & Druzhkov 1994 (Kara); *Wiktor & Okolodkov 1995 (Bar)
- P. mariebourae* (Paulsen) Balech, 1974
Ryzhov & al. 1984 (Chu)
- P. mite* (Pavillard) Balech, 1974 (62)
Gogorev 1994 (Lap)
- P. monacanthum* (Broch) Balech, 1972
*Meunier 1910 (as *Peridinium complanatum* Meunier sp. n.; Bar, Kara); Kiselev 1930 (Bar), *1937 (Chu); Zabelina 1930 (as *Peridinium complanatum*; Kara), 1946 (Kara); Shirshov 1937 (Chu, Lap); Usachev 1946 (ABas), 1968 (as *Peridinium monacanthum* and *P. complanatum*; Kara); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Ryzhov & al. 1984 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (as

- Peridinium monacanthum* and *P. complanatum*, Kara); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara); Makarevich 1996 (Bar)
- P. monovelum* (Abé) Balech, 1974
*Kiselev 1937 (Chu); Ryzhov & al. 1984 (Chu); Okolodkov 1986 (Chu), 1998 (cf. *monovelum*; Bar)
- P. oblongum* (Aurivillius) Parke et Dodge, 1976
Kiselev 1937 (Chu)
- P. oceanicum* (Vanhöffen) Balech, 1974
Kiselev 1928 (Bar); Roukhijainen 1966 (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara); Okolodkov unpub (Chu)
- P. ovatum* Pouchet, 1883
Palibin 1903-1906 (Bar); Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (Bar, Kara); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Derjugin 1915 (Bar); Mielck 1917 (Bar); Kiselev 1925 (Whi), 1928 (Bar), 1937 (as *Peridinium ovatum* forma; Chu), 1957 (Whi); Wulff 1929 (Bar); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1946 (as *Peridinium globulus* var. *ovatum*; ABas), 1968 (as *P. globulus* var. *ovatum*; Kara); Roukhijainen 1966 (Bar); Sokolova 1972 (as *Peridinium globulus* var. *ovatum*; Bar); Zhitina 1981a (Whi); Ryzhov & al. 1984 (as *Peridinium globulus* v. *ovatum*; Chu); Makarevich & Koltsova 1989 (as *Peridinium globulus* var. *ovatum*); Likhacheva 1991 (as *Peridinium globulus* var. *ovatum*; Whi); Vasjutina 1991 (as *Peridinium globulus* var. *ovatum*; Bar); Larionov 1992, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara, Bar); Makarevich 1995 (Kara); Okolodkov 1996c (subsp. *ovatum*; Bar), 1998 (cf. *ovatum*; Bar), unpub (Lap)
- P. pallidum* (Ostenfeld) Balech, 1973
Linko 1907, 1912 (Bar); *Meunier 1910 (Bar, Kara); Derjugin 1915 (Bar); *Henckel 1925 (Kara); Kiselev 1925 (Whi), 1928 (Bar), 1930 (Whi), 1935a (Kara), 1937 (Chu), 1939 (Whi), 1950 (Lap), 1957 (Whi); Wulff 1929 (Bar); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1946 (ABas), 1968 (Kara); Shirshov 1937 (Lap, ESib, Chu); Gostilovskaya 1948 (Whi); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Koltsova 1971 (Whi); Sokolova 1972 (Bar); Khlebovich 1974 (Whi); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); Ryzhov 1985, 1987, 1988a, 1994 (Bar); *Okolodkov 1986 (Chu), 1988b (ESib), 1993c, 1996c, 1998 (Bar); Galkina & al. 1988 (Whi); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & al. 1991 (Bar); Sergeeva 1991 (Whi); Vasjutina 1991 (Bar); Druzhkov & Makarevich 1992 (Bar); Larionov 1992, 1993, 1995 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap), 1995 (Whi); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Gogorev & Okolodkov 1996 (Chu); Makarevich 1996 (Bar)
- 1983 (Whi); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu), 1993d, 1996c, 1998 (Bar), unpub (Lap); Ryzhov 1987, 1988a, 1994 (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Sergeeva 1991 (Whi); Larionov 1992, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap), 1995 (Whi); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Gogorev & Okolodkov 1996 (Chu)
- P. pellucidum* Bergh, 1882
Palibin 1903-1906 (Bar); Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (Bar); Elenkin & Linko 1912 (Bar), 1915 (Bar, Kara); Breitfuss 1915 (Bar); Derjugin 1915 (Bar); Levander 1916 (Whi); Kiselev 1925 (Whi), 1928 (Bar), 1935a (Kara), 1937 (Chu), 1939, 1957 (Whi); Wulff 1929 (Bar); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Usachev 1935 (Bar), 1946, 1949, 1961 (ABas), 1968 (Kara); Shirshov 1937 (Lap, ESib, Chu), 1938 (ABas); Gostilovskaya 1948 (Whi); Kamshilov & al. 1958 (Bar); Roukhijainen 1962, 1966 (Bar); Fedorov 1969 (Whi); Kokin & al. 1970 (Whi); Koltsova 1971 (Whi); Sokolova 1972 (Bar); Khlebovich 1974 (Whi); Barabasheva & al. 1979 (Whi); Iljash & Koltsova 1981 (Kara); Zhitina 1981a, 1982, 1986 (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); Ryzhov 1985, 1987, 1988a, 1994 (Bar); *Okolodkov 1986 (Chu), 1988b (ESib), 1993c, 1996c, 1998 (Bar); Galkina & al. 1988 (Whi); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & al. 1991 (Bar); Sergeeva 1991 (Whi); Vasjutina 1991 (Bar); Druzhkov & Makarevich 1992 (Bar); Larionov 1992, 1993, 1995 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap), 1995 (Whi); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Gogorev & Okolodkov 1996 (Chu); Makarevich 1996 (Bar)
- P. pentagonum* (Gran) Balech, 1974
Elenkin & Linko 1915 (Bar, Kara); Linko 1915 (Bar); *Kiselev 1928 (Bar), 1937 (Chu); Zabelina 1930, 1946 (Kara); Shirshov 1937 (Chu); Roukhijainen 1966 (Bar); Usachev 1968 (Kara); Ryzhov & al. 1984 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara)
- P. pyriforme* (Paulsen) Balech, 1974 subsp. *pyriforme*
*Meunier 1910 (as *Peridinium piriforme*; Kara); Kiselev 1928 (Bar), 1937 (Chu), 1939 (Whi);

- Zabelina 1946 (Kara); Gostilovskaya 1948 (Whi); Roukhijainen 1966 (Bar); Usachev 1968 (Kara); Sokolova 1972 (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Makarevich & al. 1991 (Bar); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Okolodkov 1998 (cf. *pyriforme*; Bar), unp (Chu)
- P. pyriforme* subsp. *breve* (Paulsen) Balech (63)
Kiselev 1928 (Bar), 1932 (Lap), 1937 (Chu), 1939, 1957 (Whi); Zabelina 1930, (+ *P. turgidum* var. *karianum* n. var.; Kara), 1946 (Kara); Usachev 1935 (Bar), 1968 (Kara); Shirshov 1937 (ESib, Lap, Chu); Roukhijainen 1966 (Bar); Zhitina 1981a (Whi); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Okolodkov 1986 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & al. 1991, 1993 (Bar); Vasjutina 1991 (Bar); Druzhkov & Makarevich 1992 (Bar); Makarevich & Larionov 1992 (Bar); Gogorev 1994 (as *Protoperidinium breve* (Pauls.) Balech; Lap); Makarevich & Druzhkov 1994 (as *Protoperidinium breve* (Pauls.) Balech; Kara, Bar); Makarevich 1995, 1996 (as *Protoperidinium breve*; Kara)
- P. quarnerense* (Schröder) Balech, 1974 (as *Peridinium globulus* var. *quarnerense* everywhere)
Roukhijainen 1966 (Bar); Usachev 1968 (Kara); Semina & Sergeeva 1983 (Whi); Makarevich & Koltsova 1989 (Kara); Larionov 1993, 1995 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)
- P. roseum* (Paulsen) Balech, 1974
*Meunier 1910 (Bar, Kara); Kiselev 1928 (Bar); Wulff 1929 (Bar); Usachev 1935 (Bar); Shirshov 1937 (Lap); Roukhijainen 1966 (Bar); Usachev 1968 (as *Peridinium "roseum"*; Kara); Ryzhov 1988a (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar)
- P. saltans* (Meunier) Balech, 1973
*Meunier 1910 (Bar); Kiselev 1928 (Bar), 1937 (Chu); Roukhijainen 1966 (Bar); Ryzhov 1988a (Bar); Zabelina 1930 (Kara); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); Okolodkov 1996b (Chu, Kara, Bar)
- P. solidicome* (Mangin) Balech, 1974
Ryzhov & al. 1984 (Chu); Ryzhov 1988a (Bar)
- P. sphaericum* (Murray et Whitting) Balech, 1974 (64)
Makarevich & Druzhkov 1994 (Kara)
- P. steinii* (Jørgensen) Balech, 1974
Palibin 1903-1906 (Bar); *Meunier 1910 (Bar); Kiselev 1925 (Whi), 1928 (as *P. pyriforme*? (*Steinii* Jörg.); Bar); Gostilovskaya 1948 (Whi); Roukhijainen 1966 (Bar); Usachev 1968 (Kara); Ryzhov 1978, 1988a (Bar); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Vasjutina 1991 (Bar); Makarevich & Larionov 1992 (Bar); *Okolodkov 1993c (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Makarevich 1996 (Bar)
- P. subcurvipes* (Lebour) Balech, 1974
Kiselev 1937 (Chu), 1939 (Whi); Shirshov 1937 (Lap, ESib, Chu); Zabelina 1946 (Kara)
- P. subinermis* (Paulsen) Loeblich III, 1969
*Meunier 1910 (Bar); Kiselev 1925 (Whi), 1937 (Chu), 1939, 1957 (Whi); Wulff 1929 (Bar); Zabelina 1930, 1946 (Kara); Usachev 1935 (Whi, Bar), 1968 (Kara); Shirshov 1937 (Chu, Lap); Gostilovskaya 1948 (Whi); Roukhijainen 1966 (Bar); Sokolova 1972 (Bar); Ryzhov 1978, 1988a (Bar); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (Chu); Okolodkov 1986 (Chu); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Sergeeva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar)
- P. subpyriforme* (Dangeard) Balech, 1974 (65)
Ryzhov & al. 1984 (Chu)
- P. thorianum* (Paulsen) Balech, 1973
*Meunier 1910 (Bar); Kiselev 1928 (Bar), 1935a (Kara), 1937 (Chu), 1957 (Whi); Zabelina 1930, 1946 (Kara); Virketis & Kiselev 1933 (Bar); Shirshov 1937 (Lap, ESib, Chu); Roukhijainen 1962, 1966 (as *Glenodinium thorianum*; Bar); Usachev 1968 (Kara); Koltsova & Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi); Okolodkov 1986, 1988 (Chu); Ryzhov 1988a (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & al. 1991, 1993 (Bar); Makarevich & Larionov 1992 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); *Wiktor & Okolodkov 1995 (Bar); Gogorev & Okolodkov 1996 (Chu)
- P. turgidum* (Meunier) Balech, 1974 (66)
*Meunier 1910 (as *Peridinium turgidum* sp. n.; Kara); Zabelina 1930 (type form + var. *karianum* n. var.; Kara); Kiselev 1935a (var. *karianum* Sab.; Kara), 1937 (type form + var. *karianum*; Chu); Usachev 1935 (as *Peridinium turgidum*; Bar); 1968 (var. *karianum* Jabel); Makarevich & Koltsova 1989 (var. *karianum* Jabel; Kara); Makarevich & Larionov 1992 (Bar)

P. ventrale (Abé) Balech, 1974 (67)
Roukhijainen 1966 (Bar); Ryzhov & al. 1984 (Chu);
Makarevich & Larionov 1992 (Bar)

P. verrucosum (Meunier) Balech, 1974 (68)
*Meunier 1910 (as *Peridinium verucosum* sp. n.;
Kara); Koltsova & Iljash 1982 (Kara); Makarevich &
Koltsova 1989 (Kara); Makarevich & Larionov 1992
(Bar); Makarevich & Druzhkov 1994 (Kara)

Protoperidinium sp.
Gogorev 1994 (Lap); Makarevich 1996 (Bar);
Okolodkov 1988b, 1996c (Bar)

Oxytoxaceae

Oxytoxum Stein, 1883

Oxytoxum belgicum Meunier, 1910
*Meunier 1910 (Kara); Zabelina 1946 (Kara);
Usachev 1968 (Kara); Koltsova & Iljash 1982
(Kara); Makarevich & Koltsova 1989 (Kara);
Makarevich & Druzhkov 1994 (Kara)

O. gladiolus Stein, 1883
Roukhijainen 1966 (Bar); Makarevich & Larionov
1992 (Bar); Makarevich & Druzhkov 1994 (Kara)

O. milneri Murray et Whitting, 1899 (69)
Makarevich & Druzhkov 1994 (Kara)

Dinophysiales Dinophysiaceae

Dinophysis Ehrenberg, 1839

Dinophysis acuminata Claparède et Lachmann, 1859
Elenkin & Linko 1915 (Bar); Linko 1915 (Bar);
Kiselev 1928 (Bar); Zabelina 1930 (in a lake on
the coast of Novaya Zemlya), 1946 (Kara);
Usachev 1935 (Whi), 1968 (Kara); Shirshov 1937
(Chu, ESib); Roukhijainen 1966 (Bar); Semina &
Sergeeva 1983 (Whi); *Okolodkov 1986 (Chu),
1998 (Bar); Makarevich & Koltsova 1989 (Kara);
Ryzhov 1988a (Bar); Likhacheva 1991 (Whi);
Sarukhan-Bek & al. 1991 (Whi); Sergeeva 1991
(Whi); Makarevich & Larionov 1992 (Bar);
Makarevich & al. 1993 (Bar); Makarevich &
Druzhkov 1994 (Kara, Bar)

D. acuta Ehrenberg, 1839
Linko 1907, 1912, 1915 (Bar); Elenkin & Linko
1912, 1915 (Bar); Breitfuss 1915 (Bar); Derjugin
1915 (Bar); Kiselev 1925 (Whi), 1928 (Bar); Wulff
1927 (Bar); Zabelina 1930, 1946 (Kara); Shirshov
1937 (Chu, Lap); Sokolova 1972 (Bar); Ryzhov &
al. 1984 (Chu); Ryzhov 1988a (Bar); Likhacheva
1991 (Whi); Vasjutina 1991 (Bar); Makarevich &
Larionov 1992 (Bar); Makarevich & al. 1993 (Bar);

Makarevich & Druzhkov 1994 (Bar); *Wiktor &
Okolodkov 1995 (Bar); Makarevich 1996 (Bar)

D. apiculata Meunier, 1910 (70)

*Meunier 1910 (Bar, Kara); Makarevich & Larionov
1992 (Bar)

D. arctica Mereschowsky, 1878 (71)

*Mereschkowsky 1878, 1879 (Whi); Derjugin
1915 (Bar); Kiselev 1925 (Whi), 1932 (Lap), 1939
(Whi); Zabelina 1930 (in a lake on the coast of
Novaya Zemlya), 1946 (Kara); Usachev 1935
(Bar), 1968 (Kara); Shirshov 1937 (Chu, Lap);
Kiselev 1937 (Chu); Gostilovskaya 1948 (Whi);
Roukhijainen 1966 (Bar); Barabasheva & al. 1979
(Whi); Zhitina 1981a, 1982 (Whi); Koltsova &
Iljash 1982 (Kara); Semina & Sergeeva 1983 (Whi);
Ryzhov 1988a (Bar); Makarevich & Koltsova
1989 (Kara); Likhacheva 1991 (Whi); Larionov
1992, 1993 (Bar); Makarevich & Larionov 1992
(Bar); Makarevich & al. 1993 (Bar); Gogorev 1994
(Lap); Makarevich & Druzhkov 1994 (Kara, Bar);
Makarevich 1995 (Kara); Okolodkov 1996b (Lap,
Kara, Bar, Whi)

D. baltica (Paulsen) Kofoid et Skogsberg, 1928

Roukhijainen 1966 (as *D. cassubica*; Bar);
Makarevich & Larionov 1992 (as *D. cassubica*; Bar)

D. fortii Pavillard, 1916

Ryzhov & al. 1984 (Chu)

D. irregularis (Lebour) Balech, 1967

Usachev 1935 (as *Phalacroma irregulare*; Bar);
Roukhijainen 1966 (as *P. irregulare*; Bar); Vasjutina
1991 (as *P. irregulare*; Bar); Makarevich & Larionov
1992 (as *P. irregulare*; Bar); Makarevich &
Druzhkov 1994 (Bar)

D. islandica Paulsen, 1949 (72)

Kiselev 1957 (f. *angulata* Paulsen; Whi); Semina &
Sergeeva 1983 (Whi)

D. meunieri Schiller, 1933 (73)

*Meunier 1910 (as *D. cuneiformis*; Bar, Kara);
Zabelina 1946 (as *D. cuneiformis*; Kara);
Roukhijainen 1966 (as *D. Meunieri*; Bar);
Makarevich & Larionov 1992 (Bar); Makarevich &
Druzhkov 1994 (Kara)

D. norvegica Claparède et Lachmann, 1859

*Meunier 1910 (Bar); Elenkin & Linko 1912, 1915
(Bar); Linko 1912, 1915 (Bar); Derjugin 1915 (Bar);
Levander 1916 (Whi); Kiselev 1925 (Whi), *1928
(type form + v. *crassior* f. *levis* n. f.; Bar), 1937
(type form + v. *laevis*; Chu), 1939 (type form + f.
levis; Whi), 1957 (Whi); Zabelina 1930, 1946 (type
form + var. *levis* Kiselev; Kara); Virketis & Kiselev
1933 (type form + f. *levis*; Bar); Usachev 1935

- (type form + var. *crassior*, Whi, Bar), 1946 (ABas), 1968 (type form + var. *laevis*; Kara); Shirshov 1937 (Lap); Gostilovskaya 1948 (Whi); Kamshilov & al. 1958 (Bar); Roukhijainen 1966 (Bar); Fedorov 1969 (Whi); Kokin & al. 1970 (Whi); Koltsova 1971 (Whi); Sokolova 1972 (Bar); Khlebovich 1974 (Whi); Ryzhov 1978, 1987, 1988a, b, 1990, 1994 (Bar); Barabasheva & al. 1979 (Whi); Zhitina 1981a, b, 1982, 1986 (Whi); Fedorov & al. 1982 (Whi); Koltsova & Iljash 1982 (Kara); Ryzhov & al. 1984 (Chu); *Okolodkov 1986 (Chu), 1996b (Chu, Kara, Bar, Whi), 1996c (Bar); Galkina & al. 1988 (Whi); Makarevich & Koltsova 1989 (Kara); Mikhailovsky & Zhitina 1989 (Whi); Likhacheva 1991 (Whi); Sergeeva 1991 (Whi); Vasjutina 1991 (Bar); Makarevich & al. 1991 (Bar); Larionov 1992 (Bar); Makarevich & Larionov 1992 (type form + var. *crassior* f. *levis*; Bar); Makarevich & al. 1993 (Bar); Galkina & al. 1994 (ESib); Makarevich & Druzhkov 1994 (Kara, Bar); Gogorev 1995 (var. *norvegica*, var. *crassior*, var. *debiliior*, var. *rotundata*; Whi); *Wiktor & Okolodkov 1995 (Bar); Gogorev & Okolodkov 1996 (Chu); Makarevich 1996 (Bar); Okolodkov & Dodge 1996 (Chu, Kara, Bar, Whi)
- D. ovum* Schütt, 1895
Usachev 1935 (Whi); Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)
- D. paulsenii* (Schiller) Balech 1967
Ryzhov & al. 1984 (Chu)
- D. pulchella* (Lebour) Balech, 1967
Makarevich & Druzhkov 1994 (Kara); Okolodkov 1998 (Bar)
- D. punctata* Jörgensen, 1923
Zabelina 1946 (Kara); Usachev 1968 (Kara); Makarevich & Koltsova 1989 (Kara); Makarevich & Druzhkov 1994 (Kara)
- D. rotundata* Claparède et Lachmann, 1859
Linko 1907, 1912, 1915 (Bar); *Meunier 1910 (Bar, Kara); Elenkin & Linko 1912, 1915 (Bar); Derjugin 1915 (Bar); Levander 1916 (Whi); Kiselev 1925 (Whi), 1928 (Bar), 1937 (as *Phalacroma rotundatum* Kofoid et Michener; Chu), 1939 (also as *P. rotundatum*; Whi); Zabelina 1930, 1946 (as *P. rotundatum*; Kara); Usachev 1935 (as *P. rotundatum*; Bar), 1968 (Kara); Shirshov 1937 (as *P. rotundatum*; Chu, Lap); Kiselev 1937 (Chu), 1939 (Whi); Gostilovskaya 1948 (as *P. rotundata*; Whi); Kamshilov & al. 1958 (as *P. rotundatum*; Bar); Roukhijainen 1962 (Bar), 1966 (as *P. rotundatum*; Bar); Sokolova 1972 (as *P. rotundatum*; Bar); Semina & Sergeeva 1983 (Whi); Ryzhov & al. 1984 (as *P. rotundatum*; Chu); Okolodkov 1986 (Chu), 1996c (Bar); Ryzhov 1988a (as *P. rotundatum*; Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (as *P. rotundatum*; Whi); Sarukhan-Bek & al. 1991 (as *P. rotundatum*; Whi); Sergeeva 1991 (as *P. rotundatum*; Whi); Vasjutina 1991 (as *P. rotundatum*; Bar); Druzhkov & Makarevich 1992 (as *P. rotundatum*; Bar); Makarevich & Larionov 1992 (as *P. rotundatum*; Bar); Makarevich & al. 1993 (Bar); Makarevich & Druzhkov 1994 (Kara, Bar); Gogorev 1995 (Whi); *Wiktor & Okolodkov 1995 (Bar)
- D. semen* Meunier, 1910 (74)
*Meunier 1910 (Bar, Kara); Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)
- D. sphaerica* Stein, 1883 emend. Kofoid et Skogsberg, 1928
Roukhijainen 1962, 1966 (Bar); Makarevich & Koltsova 1989 (Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar); Makarevich & al. 1993 (Bar); Gogorev 1994 (Lap); Makarevich & Druzhkov 1994 (Kara)
- D. truncata* Cleve, 1900
Usachev 1968 (Kara); Makarevich & Koltsova 1989 (Kara)
- D. vertex* Meunier, 1910 (75)
*Meunier 1910 (Bar, Kara); Likhacheva 1991 (Whi); Makarevich & Larionov 1992 (Bar)
- Dinophysis* sp.
Linko 1912 (Bar); *Kiselev 1925 (Whi); Sokolova 1972 (Bar)
- Prorocentrales
Prorocentraceae
- Prorocentrum* Ehrenberg, 1834
- Prorocentrum balticum* (Lohmann) Loeblich III, 1970
*Wulff 1919 (as *Exuviaella baltica* Lohmann; Bar); Usachev 1935 (as *E. baltica*; Whi); Sokolova 1972 (as *E. baltica*; Bar); Koltsova & Iljash 1982 (as *E. baltica*; Kara); Ryzhov 1988a (as *E. baltica*; Bar); Makarevich & Koltsova 1989 (Kara); Sarukhan-Bek & al. 1991 (Whi); Makarevich & Larionov 1992 (as *E. baltica*; Bar); Makarevich & Druzhkov 1994 (as *E. baltica*; Kara); Okolodkov 1998 (Bar)
- P. compressum* (Bailey) Abé ex Dodge, 1975
Makarevich & Druzhkov 1994 (as *Exuviaella compressa* Ostenfeld; Kara)
- P. cordatum* (Ostenfeld) Dodge, 1975
Sarukhan-Bek & al. 1991 (as *Exuviaella cordata* Ostenfeld; Whi)

P. dentatum Stein, 1883

Roukhijainen 1966 (Bar); Makarevich & Larionov 1992 (Bar)

P. lima (Ehrenberg) Dodge, 1975 (76)

*Cenkovskij 1881 (as *Exuviaella marina* nov. sp.; Whi); Derjugin 1915 (as *Exuviaella lima*; Bar); Kiselev 1925 (Whi); Roukhijainen 1966 (as *Exuviaella marina* var. *lima*; Bar); Semina & Sergeeva 1983 (Whi); Makarevich & Larionov 1992 (as *Exuviaella marina* var. *lima*; Bar)

P. micans Ehrenberg, 1883

Gogorev & Okolodkov 1996 (Chu)

P. minimum (Pavillard) Schiller, 1933

Okolodkov 1998 (Bar)

P. scutellum Schröder, 1900

Vasjutina 1991 (Bar); Makarevich & Druzhkov 1994 (Bar)

Prorocentrum sp.

Gostilovskaya 1948 (as *Exuviaella* sp.; Whi); Kamshilov & al. 1958 (also as *Exuviaella* sp.); Sokolova 1972 (as *Exuviaella* sp.; Bar); Likhacheva 1991 (as *Exuviaella* sp.; Whi)

Phytodinales

Phytodiniaceae

Cystodinium Klebs, 1912*Cystodinium cornifax* (Schilling) Klebs, 1912 (77)

Likhacheva 1991 (Whi)

Blastodiniiphyceae

Blastodinales

Cachonellaceae

Dissodinium Klebs in Pascher, 1916*Dissodinium pseudolunula* Swift ex Elbrächter et

Drebes, 1978 (78)

Okolodkov 1986, *1988a (Chu)

Incertae sedis

Dinoflagellate cysts (79)

*Meunier 1910 (as *Echinum majus* sp. n. and *E. minus* sp. n.; Bar, Kara); *Okolodkov 1993b, 1996d, 1998 (Bar)

NOTES

1. The binomial *Amphidinium arcticum* was probably used by RYZHOV (1988a) by mistake instead of *Gymnodinium arcticum*.
2. Described by DREBES (1974), the motile stage of the parasitic dinoflagellate attached to the diatom *Chaetoceros* appears to be identical with *Amphidinium sphenoides*.

3. MEUNIER (1910) did not illustrate *Gymnodinium arcticum* in ventral view, so it remains an inadequately described species.

4. Record is questionable; the species is known from southerly areas. DODGE (1985) considers *Gymnodinium pseudonociluca* to be synonymous with *Spatulodinium pseudonociluca* (POUCHET) J. CACHON ET M. CACHON and places the species into the family Noctilucaceae. After FENSOME & al. (1993), the genus *Spatulodinium* J. CACHON ET M. CACHON belongs to the family Kofoidiniaceae.

5. Once found in abundance on the under ice surface in the lagoon where *Gymnodinium* cf. *punctatum* turned the ice pink due to the pigment contained in the cells.

6. As noted by LEBOUR (1925), *Gymnodinium vestificii* bears a strong resemblance to *Katodinium glaucum*. The two species are probably conspecific.

7. Most of the records of *Gymnodinium wulffii* from the Arctic were not documented with illustrations.

8. Record is questionable, because identification was provisional. The examined cell was much smaller (37 µm long and 25 µm wide) than those described by KOFOID & SWEZY (1921) from Californian waters (124-158 µm and 52-80 µm wide). In addition, the sulcus and the cingulum were not studied critically and coral-red pigment characteristic of *Gyrodinium corallinum* was absent.

9. Referred to as *Gyrodinium fusiforme* KOFOID ET SWEZY, except in MEUNIER (1910).

10. Record is questionable and not documented with illustrations. The only examined cell appears to be *Gyrodinium spirale*. *G. ochraceum* has been known from Californian waters and the Adriatic Sea (KOFOID & SWEZY 1921; SCHILLER 1933).

11. An ectoparasite found attached to the setae of the planktonic diatom *Chaetoceros convolutus* CASTRACANE in the Chukchi Sea and to *C. concavicornis* MANGIN in the Barents Sea. Also, *Paulsenella chaetoceratis* has been known ectoparasitizing on *C. decipiens* CLEVE and *C. borealis* BAILEY (DREBES 1974).

12. MEUNIER (1910) described the two new species, *Gymnaster striatum* and *G. helix*, on the basis of the internal siliceous skeletal parts found in snow, in the Barents Sea, and ascribed them to silicoflagellates. At present, *Gymnaster* SHÜTT is generally considered to be synonymous with *Actiniscus* and attributed to dinoflagellates. The two species are probably synonymous with *Actiniscus pentasterias*.

13. Referred to as *Gonyaulax catenata* (LEVANDER) KOFOID where not indicated. The only thecate dinoflagellate species hitherto known to be associated with sea ice, in particular, in the Kara Sea. In general, it can be characterized as sympagic-planktonic.

14. Referred to as *Glenodinium danicum* PAULSEN. See OKOLODKOV & DODGE (1995) for systematic position of the genus *Peridiniella*. Under the name *P. danica* there is probably a group of closely related species. *P. danica* can be easily confused with athecate species of the genus *Gymnodinium*, so most of the records of *P. danica* are questionable.

15. Referred to as *Gonyaulax triacantha* JØRGENSEN where not indicated.

16. The only freshwater species in the genus *Gonyaulax*. Record in the Barents Sea is questionable.

17. Requires reinvestigation. According to SCHILLER (1937) ascription of *Gonyaulax nivicola* to the genus *Gonyaulax* is provisional. Probably, the species belongs to the genus *Amylax*.

18. Inadequately described species which seems to belong to the order Gonyaulacales. Identification of the species to the generic level is questionable, since no information on the epithecal plate arrangement was given.
19. Referred to as *Gonyaulax polyedra* STEIN.
20. *Protoceratium splendens* and *P. reticulatum* are probably conspecific. After MEUNIER (1910), the former differs from the latter in larger size, less angulate shape of the cell and denser pattern in ornamentation of the theca.
21. *Ceratium arcticum* and *C. longipes* are probably conspecific. In the present list, the two specific names are retained. See USACHEV (1935) for the morphological variability in these two species. For mapped species ranges and for discussion on the systematic status of the taxa see OKOLODKOV (1996b).
22. SOURNIA (1967) amalgamated *Ceratium compressum* with *C. platycorne* DADAY, however, DODGE (1985) considers them different species. If so, *C. compressum* has one of the most restricted geographical distribution among dinoflagellates, occurring mainly in the north-eastern Atlantic (DODGE & MARSHALL 1994). ELENKIN (ELENKIN & LINKO 1915) found *C. compressum* in the south-western Barents Sea and mentioned a new form, f. *divergens* ELENKIN, which should be considered *nomen nudum*.
23. *Ceratium hirundinella* is a freshwater species which can be found in the near-shore area due to the river run-off.
24. See a note on *Ceratium arcticum*.
25. Referred to as *Goniodoma ostenfeldii* PAULSEN.
26. Referred to as *Gonyaulax tamarensis* LEBOUR.
27. Inadequately described species, like the other *Glenodinium* species presented here. At present, almost all marine species previously attributed to the genus *Glenodinium* are transferred to other genera. For the usage of the name *Glenodinium*, see SOURNIA (1986).
28. The description and illustration of f. *mezeniense* f. *nova* are given in KISELEV (1960), not in KISELEV (1957), although the name of the new form was first used in the latter.
29. Inadequately described species; requires reinvestigation as most of new *Peridinium* species described by MEUNIER (1910). If they exist, they are obviously marine and, for the most part, belong to the genus *Protoperidinium* (for discussion on the ecology of the genera *Peridinium* and *Protoperidinium* see SOURNIA 1986). Here, the generic name *Peridinium* is conserved for some of Meunier's new species, since their systematic position has not been changed hitherto.
30. Under the name *Peridinium belgicum*, WULFF (1919) placed two different dinoflagellates, one of which is probably *Peridiniella danica* or an allied species (table 2, fig. 16a) and the one appears to be *Protoperidinium brevipes* (table 2, fig. 16b).
31. A freshwater species reported by LIKHACHEVA (1991) from the White Sea; occurrences in the near-shore areas of the other Russian Arctic seas are possible. Very common in ponds and lakes in Europe (POPOVSKÝ & PRIESTER 1990). Not synonymous with *Protoperidinium bipes* (PAULSEN) BALECH.
32. Although reported only from the White Sea and being a freshwater species, *Peridinium cinctum* can be encountered in the estuarine regions along the Russian Arctic coast.
33. *Peridinium gracile* and *Protoperidinium pellucidum* are probably conspecific.
34. *Peridinium granisparsum* and *Protoperidinium punctulatum* are probably conspecific. Both have similar shape of the cell, the first apical plate 1' of ortho type, no offset of the girdle and punctate surface. MEUNIER (1910) stressed that *P. granisparsum* differs from *P. punctulatum* by rarer punctations on the surface of theca and by the hypotheca deeply cut by the sulcus. However, the depression at antapex is the same in Meunier's *P. granisparsum* and *P. punctulatum* illustrated in detail by BALECH (1949). As regards punctations, in our specimens of *P. punctulatum* from the Chukchi Sea they were as dense as in Meunier's *P. granisparsum*. Thus, Meunier's opinion on the morphological difference between the two species does not seem convincing.
35. MEUNIER (1910) noted that *Peridinium gravidum* was easily identifiable and was not rare in the surface samples from the Barents and Kara seas. However, nobody but him documented the species with drawings. In shape and the cingulum offset, it is close to *Protoperidinium cerasus* in BALECH (1973) differing from the latter in the absence of the apical horn and in shorter antapical spines.
36. Earlier description of *Peridinium ovaliforme* by KISELEV (1928) provided with two drawings was not considered by himself in his later work (KISELEV 1950). The species is close to *Scrippsiella trochoidea* in morphology. Not taking into account a slightly bigger size of the former (length 40 µm, breadth 28 µm), these two taxa share at least the following features: shape of the epitheca in both ventral and apical views, the cingulum offset, the type and shape of the first apical plate 1', the presence of long canal plate (for explanation of the term, see DODGE & HERMES 1981). Thus, *Peridinium ovaliforme* is most probably identical to *Scrippsiella trochoidea*.
37. Although MEUNIER (1910) pictured *Peridinium ovatoides* with six apicals and no intercalaries (pl. 1, fig. 26) which does not correspond to the formula of epitheca in the genus *Peridinium* or *Protoperidinium*, *Peridinium ovatoides* most likely belongs to the genus *Protoperidinium*.
38. Record of *Peridinium raciborskii* is questionable. Poor sketch of this species made by GOGOREV (1994) in his notebook cannot provide reliable identification. At least, the sutures between some plates on the dorsal side of the pictured cell are different from those in *P. raciborskii* in its big third intercalary plate 3a (POPOVSKÝ & PRIESTER 1990).
39. *Peridinium rhombus* and *Protoperidinium pellucidum* probably conspecific.
40. *Peridinium rotundatum* was described by ABÉ (1936) from Japanese waters and no any other record has been known. The record of this species from the Laptev Sea by GOGOREV (1994) is doubtful, since no morphological features but outline of the only cell and its size were examined.
41. The alga found in the White Sea, described and illustrated by CENKOVSKIJ (1881) does not seem to be a dinoflagellate, at least, it is not in the order Peridiniales. Its systematic position is uncertain.
42. Inadequately described species. *Peridinium sphaericum* MEUNIER is a homonym of *P. sphaericum* MURRAY ET WHITTING, 1899 and *P. sphaericum* OKAMURA, 1912; the latter is synonymous with *Protoperidinium inclinatum* (SOURNIA 1973, 1978).
43. Although reported only from the White Sea and being a freshwater species, *Peridinium umbonatum* occurs in the estuarine regions along the Russian Arctic coast.

44. Most likely, the authors who mentioned *Peridinium* sp. from the White and Barents seas meant the marine dinoflagellates that are presently ascribed to the genus *Protoperidinium*.
45. At present, eight closely related genera represented in the sea are recognized within the *Diplopsalis* group: *Boreadinium* DODGE ET HERMES, *Diplopsalis*, *Diplopsalopsis*, *Dissodium* ABÉ, *Gotoius* ABÉ, *Lebouraia*, *Oblea* and *Preperidinium* MANGIN (DODGE & TORIUMI 1993; ELBRÄCHTER 1993). As shown by ELBRÄCHTER (1993), the generic names *Diplopeltopsis* PAVILLARD and *Zygabikodinium* LOEBLICH JR ET LOEBLICH III are synonymous with *Preperidinium*.
46. A freshwater species known from lakes, ponds and brackish waters in Europe (POPOVSKÝ & PFIESTER 1990). The correct authorship with the specific name in USACHEV (1935) should be *Entzia acuta* (APSTEIN) LEBOUR, because the genus *Entzia* was described by LEBOUR (1919-1922).
47. No doubt that *Diplopsalis sphaerica* belongs to the 'Diplopsalis' group. One antapical plate characteristic of the genera *Boreadinium* DODGE & HERMES, *Diplopsalopsis* BERGH and *Preperidinium* MANGIN is obvious. However, the epithecal plate arrangement can hardly be interpreted. The incorrectly presented species appears to be *Diplopsalis lenticula* or *Preperidinium meunieri* which are common in the Arctic. Judging from globular shape of the cell, it may be conspecific with the taxon described by KISELEV (1935b) as *Diplopsalis lenticula* f. *globularis* from the Sea of Japan; it distinguishes from the type form in its globular shape of the cell not flattened anterior-posteriorly. If so, the question is still open if the taxon under discussion is a separate species or a form (variety) of *D. lenticula*.
48. According to SOURNIA (1973) and FENSOME & al. (1993) the generic name *Lebouraia* is invalid, since the genus lacks a type species. However, SOURNIA (1973) proposed *L. minuta* to be a type species.
49. A new variety, var. *major*, was proposed by USACHEV (1935) because of larger cell size compared to the type variety. However, it lacks description or diagnosis and is therefore invalid.
50. In all literary sources cited here referred to as *Peridinium achromaticum* LEVANDER, 1902. BALECH (1974) transferred it to the genus *Protoperidinium*. However, BALECH (1976) who described a new species, *Protoperidinium finitimum*, believes that it was previously cited as *Peridinium achromaticum* or *Protoperidinium achromaticum*. The aspect of both species under discussion is very much alike but their cingular and sulcal plates greatly differ. The species also differ in ecology: real *Peridinium achromaticum* was found in fresh and brackish waters (LEVANDER 1916; BALECH 1963; POPOVSKÝ & PFIESTER 1990) and *Protoperidinium finitimum* is a marine species (BALECH 1976). Thus, in the present list, two species from two different genera are probably included under the name *Protoperidinium achromaticum*.
51. *Protoperidinium arcticum*, originally described as *Peridinium ovatum* f. *arctica* by GRØNTVED & SEIDENFADEN (1938), is close to *P. ovatum* var. *ovatum*; in addition, it can be easily confused with *P. granii*.
52. Mostly referred to as *Peridinium brevipes* PAULSEN, rarely as *Protoperidinium brevipes*.
53. Mostly referred to as *Peridinium bulla* MEUNIER, rarely as *Protoperidinium bulla*. Requires reexamination.
54. Mostly referred to as *Peridinium cerasus* PAULSEN, rarely as *Protoperidinium cerasus*.
55. Mostly referred to as *Peridinium conicoides* PAULSEN, rarely as *Protoperidinium conicoides*.
56. Mostly referred to as *Peridinium conicum* GRAN, rarely as *Protoperidinium conicum*.
57. Under the names *Peridinium divergens* and *P. divergens* var. *reniforme* MEUNIER (1910) are pictured mostly *Protoperidinium depressum* and, probably *P. divergens* or *P. curtipes*, the two closely related species. At least all Meunier's *Peridinium divergens* cells have an ortho first apical plate (1') characteristic of *Protoperidinium depressum*, while both *P. divergens* and *P. curtipes* have a meta 1' plate. It is difficult to interpret Meunier's drawings of the representatives of the order Peridiniales because the author was inclined to illustrate the cells provided with an ortho 1' plate. However, the offset of the cingulum and its curvature on the ventral side in all Meunier's *Peridinium divergens* cells argue in favour of *Protoperidinium depressum* rather than *P. divergens* or *P. curtipes*.
58. Requires reexamination. MEUNIER (1910) pictured *Peridinium elongatum* having an ortho first apical plate (1') and a hexa second intercalary plate (2a). Until recently, apart from Meunier, nobody documented the occurrences of this species with drawings or photographs. However, BALECH (1988) investigated in detail the morphology of theca of the only specimen collected in the South Atlantic of what he considered *Protoperidinium elongatum*. BALECH (1988) himself was not sure if his *Protoperidinium elongatum* and Meunier's new species were conspecific. However, he noted that various morphological features of both are in good correspondence. One should take into account that Balech's specimen has a penta 2a plate.
59. Record is questionable, since no illustration or description was given.
60. Record is questionable. Apart from ROUKHIJAINEN (1966), nobody reported *Protoperidinium hirobis* from the Arctic or the North Atlantic. It is known from the north-western Pacific (ABÉ 1927) near Japan and from the South Atlantic (BALECH 1988).
61. Requires reinvestigation. *Peridinium hyalinum* described by MEUNIER (1910) is close to *Scrippsiella trochoidea*, differing from the latter in quadra type second intercalary plate 2a.
62. Identified by OKOLODKOV in GOGOREV (1994).
63. In the present list, *Peridinium breve* is included with *Protoperidinium pyriforme*, according to BALECH (1988) who distinguishes the two subspecies in *P. pyriforme*, subsp. *pyriforme* and subsp. *breve* (PAULSEN) BALECH (= *Peridinium breve* PAULSEN). Some authors use the binomial *Protoperidinium breve* by mistake.
64. Record is questionable. Apart from MAKAREVICH & DRUZHKOVA (1994), nobody reported *Protoperidinium sphaericum* (MURRAY ET WHITTING) BALECH from the Arctic or the North Atlantic. In addition, confusion in authority of *P. sphaericum* is possible (see a note on *Peridinium sphaericum* OKAMURA).
65. See note 59.
66. Requires reinvestigation. Nobody but MEUNIER (1910) illustrated and gave description of the species. As KISELEV (1950) and BALECH (1974) noted, Meunier was inclined to picture almost all species, at present assigned to the genus *Protoperidinium*, with the first apical plate 1' of ortho type. Provided the species in reality has meta type plate 1', it resem-

bles *P. arcticum* in the cell shape, the girdle offset and the second intercalary plate 2a of quadrate type (GRØNTVED & SEIDENFADEN 1938; OKOLODKOV 1997).

67. Records are not documented with illustrations and therefore are questionable. The species is known with assurance from Japanese waters (ABÉ 1936).

68. Requires reinvestigation. Nobody but MEUNIER (1910) examined the species. The records from the Arctic by other authors are questionable, since they were not documented.

69. Record in the Arctic was not documented with illustrations and needs checking. The species was originally described from the area between the Azores and Panama. Distributed in the North and South Atlantic, the Mediterranean, the Indian Ocean and the Tasman Sea, being rare in Gulf Stream waters (DODGE 1985).

70. The only record of *Dinophysis apiculata* has been known from the Arctic. Judging from small size, the cells of this species may represent morphotypes, namely, gametes of other species like *D. acuminata* which is common in the Arctic. For life cycles and reproduction of *Dinophysis* species, in particular, species common in the Arctic, *D. acuminata*, *D. acuta* and *D. norvegica*, see BARDOUL & al. (1991), BERLAND, MAESTRINI & GRZEBYK (1995) and SUBBA RAO (1995). Small spine at antapex in *D. apiculata* can hardly be considered an important discriminative feature.

71. Poorly described species; requires reinvestigation. *Dinophysis arctica* described by MERESCHKOWSKY (1878) from the White Sea remains mysterious. Most of the records of the species are doubtful.

72. According to SOURNIA (1973) *Dinophysis islandica* is invalid because of lack of description.

73. Originally described as *D. cuneiformis* by MEUNIER (1910), the specimen pictured in his monograph on pl. 23, fig. 15, seems to belong to *D. acuta*.

74. Small-sized inadequately described species which may represent gametes of other species like *D. acuminata*. Also, see note 70.

75. Inadequately described species. According to LEBOUR (1925) *Dinophysis vertex* is possibly conspecific to *D. arctica*.

76. DODGE & BIBBY (1973) combined the genera *Prorocentrum* and *Exuviaella* after careful morphological examination using the electron microscopy. McLACHLAN, BOALCH & JAHN (1997) reinstated the genus *Exuviaella* on the basis of some peculiar morphological, biochemical and ecological features as well as molecular phylogenetic data. Three *Prorocentrum* species including *P. lima* sensu DODGE were transferred to *Exuviaella*. However, Elbrächter (pers. commn) considers the taxonomic status of *P. lima* is still uncertain and recommends that the name *Exuviaella* be rejected until more data is available (for more discussion, see MOESTRUP 1997).

77. *Cystodinium cornifax* is a freshwater species that can be found in the near-shore areas influenced by river runoff. In Central Europe it occurs in small stagnant water bodies (POPOVSKÝ & PFIESTER 1990).

78. Parasitic dinoflagellate which has parasitic and free-living planktonic stages in its life cycle, an ectoparasitic cell being attached to the copepod ova (DREBES 1978, 1984). In the Chukchi Sea, free-living lunate secondary cysts with four gymnodinioid dinospores were observed.

79. Dinoflagellate cysts described by MEUNIER (1910) and later found by OKOLODKOV (1993b) are rather common in

both the water column and the lowermost layer of the ice in the Barents Sea. Similar cysts from the Antarctic sea ice were found and studied in detail by BUCK & al. (1992). They were also common in faecal pellets collected in the Antarctic waters (MARINO & al. 1994).

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REFERENCES

- Abé, T.H. 1927. Report of the biological survey of Mutsu Bay. 3. Notes on the protozoan fauna of Mutsu Bay. I. Peridinales. – *Science Reports of the Tôhoku Imperial University, Sendai, Japan* 2:383-438.
- 1936. Report of the biological survey of Mutsu Bay. 30. Notes on the protozoan fauna of Mutsu Bay. III. Subgenus *Protoperidinium*: genus *Peridinium*. – *Science Reports of the Tôhoku Imperial University, Sendai, Japan* 11:19-48.
- Balech, E. 1949. Étude de quelques espèces de *Peridinium*, souvent confondues. – *Hydrobiologia* 1:390-409.
- 1963. Dos dinoflagelados de una laguna salobra de la Argentina. – *Notas del Museo, Facultad de Ciencias Naturales y Museo, Universidad Nacional de la Plata, Zoología* 20:111-123.
- 1973. Cuarta contribución al conocimiento del género "*Protoperidinium*". – *Revista del Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Hidrobiologia* 3, 5:347-367.
- 1974. El género "*Protoperidinium*" Bergh, 1881 ("*Peridinium*" Ehrenberg, 1831, partim). – *Revista del Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Instituto Nacional de Investigación de las Ciencias Naturales, Hidrobiologia* 4:1-79.
- 1976. Sur quelques *Protoperidinium* (Dinoflagellata) du Golfe du Lion. – *Vie et Milieu* 26:27-46.
- 1988. *Los dinoflagelados del Atlántico Sudoccidental*. – Ministerio de Agricultura Pesca y Alimentación, N 1, Madrid. 310 pp.
- Barabasheva, Y.M., T.V. Polyakova, V.N. Tutubalin & V.D. Fedorov 1979. Structure-forming species of the plankton community and the model of exponentially broken kernel. – *Biologicheskoe nauki (Biological Sciences), Moscow* 10:97-107.

- Bardouil, M., B. Berland, D. Grzebyk & P. Lassus 1991. L'existence de kystes chez les Dinophysales. – *C. R. Academie des Sciences Paris* 312, ser. 3:663-669.
- Berland, B.R., S.Y. Maestrini & D. Grzebyk 1995. Observations on possible life cycle stages of the dinoflagellates *Dinophysis* cf. *acuminata*, *Dinophysis acuta* and *Dinophysis pavillardii*. – *Aquatic Microbial Ecology* 9:183-189.
- Braarud, T. 1935. The "Øst" expedition to the Denmark Strait 1929. II. The phytoplankton and its conditions of growth (including some qualitative data from the Arctic in 1930). – Jacob Dybwad, Oslo. 174 pp.
- Breitfuss, L.L. 1915. General review of the activities of the Murman Fishery Research Expedition in 1906. – Pp. 1-48 in: Breitfuss, L.L. (ed.). *Transactions of the Murman Fishery Research Expedition of 1906*. Department of Agriculture, Petrograd.
- Buck, K.R., P.A. Bolt, W.N. Benthall & D.L. Garrison 1992. A dinoflagellate cyst from Antarctic sea ice. – *Journal of Phycology* 28:15-18.
- Bursa, A. 1963. Phytoplankton in coastal waters of the Arctic Ocean at Point Barrow, Alaska. – *Arctic* 16:239-262.
- Cenkovskij, L. 1881. Report on the excursion to the White Sea in 1880. – *Trudy Sankt-Peterburgskogo obshchestva estestvoispytatelej* 12:130-171.
- Derjugin, K.M. 1915. Fauna of the Kola Inlet and its living conditions. – *Memoirs of the Imperial Academy of Sciences, Petrograd, Ser. 8, 34, 1: ix + 929 pp.*, tables 1-13.
- Dodge, J.D. 1985. *Marine dinoflagellates of the British Isles*. – Her Majesty's Stationary Office, London. 303 pp.
- 1995. Thecal structure, taxonomy, and distribution of the planktonic dinoflagellate *Micracanthodinium setiferum* (Gonyaulacales, Dinophyceae). – *Phycologia* 34:307-312.
- Dodge, J.D. & B.T. Bibby 1973. The Prorocentrales (Dinophyceae). I. A comparative account of fine structure in the genera *Prorocentrum* and *Exuviaella*. – *Botanical Journal of the Linnean Society* 67:175-187.
- Dodge, J.D. & H.B. Hermes 1981. A scanning electron microscopical study of the apical pores of marine dinoflagellates (Dinophyceae). – *Phycologia* 20:424-430.
- Dodge, J.D. & H.G. Marshall 1994. Biogeographic analysis of the armored planktonic dinoflagellate *Ceratium* in the North Atlantic and adjacent seas. – *Journal of Phycology* 30:905-922.
- Dodge, J.D. & S. Toriumi 1993. A taxonomic revision of the *Diplopsalis* group (Dinophyceae). – *Botanica Marina* 36:137-147.
- Drebes, G. 1974. *Marines Phytoplankton. Eine Auswahl der Helgoländer Planktonalgen (Diatomeen, Peridineen)*. – Georg Thieme Verlag, Stuttgart. vi + 186 pp.
- 1978. *Dissodinium pseudohunula* (Dinophyta), a parasite on copepod eggs. – *British Phycological Journal* 13:319-327.
- 1984. Life cycle and host specificity of marine parasitic dinophytes. – *Helgoländer Meeresuntersuchungen* 37:603-622.
- Druzhkov, N.V. & P.R. Makarevich 1992. Structural characteristic of the microphytoplankton seasonal development in the coastal ecosystem. – Pp. 83-96 in: Kuznetsov, L.L. (ed.). *Phytoplankton of the Barents Sea*. Murmansk Marine Biological Institute, Russian Academy of Sciences, Apatity.
- Elbrächter, M. 1993. *Kolkwitzella* Lindemann 1919 and *Preperidinium* Mangin 1913: correct genera names in the *Diplopsalis*-group (Dinophyceae). – *Nova Hedwigia* 56:173-178.
- Elenkin, A.A. & A.K. Linko 1912. Journal of the zoological works on board the steamer "Andrej Pervozvannyj" and the sailing vessel "Rybak" in 1905. – Pp. 145-155 in: Breitfuss, L.L. (ed.). *Transactions of the Murman Fishery Research Expedition of 1905*. Department of Agriculture, St. Petersburg.
- 1915. Journal of the zoological works on board the steamer "Andrej Pervozvannyj" in 1906. – Pp. 182-311 in: Breitfuss, L.L. (ed.). *Transactions of the Murman Fishery Research Expedition of 1906*. Department of Agriculture, Petrograd.
- Fedorov, V.D. 1969. The dominant species of the phytoplankton in the White Sea. – *Doklady Akademii Nauk SSSR (Reports of the USSR Academy of Sciences)* 188:913-916.
- Fedorov, V.D., N.A. Smirnov & T.I. Koltsova 1982. Seasonal phytoplankton communities of the White Sea and the analysis of similarity indices. – *Izvestiya AN SSSR, Seriya biologicheskaya* 5:715-721.
- Fensome, R.A., F.J.R. Taylor, G. Norris, W.A.S. Sarjeant, D.I. Wharton & G.L. Williams 1993. *A classification of living and fossil dinoflagellates*. – Sheridan Press, Hanover, Pennsylvania. 351 pp.
- Galkina, V.N., V.Y. Burjakov & A.D. Rura 1988. The quantitative distribution of phytoplankton and bacterioplankton in the area of Sonostrov in the White Sea. – Pp. 40-49 in: *Investigations of fauna of the seas* 39, Leningrad.
- Galkina, V.N., A.D. Rura & Y.S. Gagaev 1994. Phytoplankton and its production in the Chaun Bay of the East Siberian Sea. – Pp. 112-120 in: Golikov, A.N. (ed.). *Ecosystems and the flora and fauna of the Chaun Bay of the East Siberian Sea. Part I. Explorations of the fauna of the seas* 47(55). Zoological Institute, Russian Academy of Sciences, St. Petersburg.
- Gogorev, R.M. 1994. Some peculiarities in the distribution of phytoplankton in the Laptev Sea (August - September 1993). – Pp. 337-352 in Timokhov, L.A. (ed.). *Scientific results of the LAPEX-93 Expedition*. Gidrometeoizdat, St. Petersburg.
- 1995. Species composition of the phytoplankton in Chupa Inlet, the White Sea. – *Novitates Systematicae Plantarum non Vascularium*, St. Petersburg 30:7-12.
- Gogorev, R.M. & Y.B. Okolodkov 1996. Species composition of the planktonic and sea-ice algae in the Chukchi Sea and Lavrentiya Bay (Bering Sea, August 1991). – *Botanicheskij zhurnal Rossijskoy Akademii Nauk (Botanical Journal, Russian Academy of Sciences)* 81:35-41.

- Gostilovskaya, M.I. 1948. Phytoplankton of the Gridinskaya Inlet of the White Sea. – Pp. 93-103 in: *Works of the Marine Biological Station of the Karelian-Finish University*.
- Grøntved, J. & G. Seidenfaden 1938. The phytoplankton of the waters west of Greenland. The Godthaab Expedition 1928. – *Meddelelser om Grønland* 82:1-335.
- Henckel, A.G. 1925. Materials to the phytoplankton of the Kara Sea. – *Byulleten Biologicheskogo nauchno-issledovatel'skogo instituta Permskogo gosudarstvennogo universiteta* (Bulletin of the Biological Research Institute at Perm State University) 3:1-60, tables 1-7.
- Hsiao, S.I.C. 1983. A checklist of marine phytoplankton and sea ice microalgae recorded from Arctic Canada. – *Nova Hedwigia* 37:225-313.
- Iljash, L.V. & T.I. Koltsova 1981. Phytoplankton of Yenisey Bay. – *Gidrobiologicheskii zhurnal* (Hydrobiological Journal, USSR) 17:3-8.
- Kamshilov, M.M., E.A. Zelikman & M.I. Roukhijajnen 1958. Plankton in the Murman coastal waters. – Pp. 59-102 in: *Regularities in gathering and migrations of commercial fishes in the Murman coastal zone and their relation to the biological, hydrological and hydrochemical processes*. Moscow.
- Khlebovich, T.V. 1974. Composition and seasonal changes in the number of phytoplankton in the Chupa Inlet of the White Sea. – Pp. 56-64 in: Bykhovsky, B.E. (ed.). *Seasonal phenomena in the life of the White and Barents seas*. Nauka, Leningrad.
- Kiselev, I.A. 1925. Phytoplankton of the White Sea. – Pp. 1-43 in: Derjugin, K.M. (ed). *Explorations of the Russian Seas*, 2. Russian Hydrological Institute, Leningrad.
- 1928. Contribution to the question of distribution and composition of the phytoplankton in the Barents Sea. – Pp. 28-42 in: Derjugin, K.M. (ed). *Materials on the biology of the Barents Sea in the area of the Kola Meridian (33°30' E)* (Transactions of the Institute of the North Studies 37). Izdanie Nauchno-tekhnicheskogo Upravleniya V.S.N.K., Moscow.
- 1930. The peculiarities of phytoplankton in the northern river estuaries. – Pp. 221-223 in: *Reports of the 2nd All-Union Hydrological Conference in 1928*, part 3.
- 1932. Materials on the microflora of the south-eastern Laptev Sea. – Pp. 67-103 in: *Investigations of the seas of the USSR*, 15. State Hydrological Institute, Leningrad.
- 1935a. Some data on the phytoplankton from the north-eastern part of the Kara Sea. – Pp. 191-202 in: *Results of the Taymyr Hydrographic Expedition. Part II. Hydrology, meteorology, hydrobiology*. Hydrographic Department UMS RKKA, Leningrad.
- 1935b. The species composition and periodicity of the phytoplankton in the Patroclus Bight, the Sea of Japan. – Pp. 82-118 in: *Investigations of the seas of the USSR*, 22. Leningrad.
- 1937. Composition and distribution of the phytoplankton in the northern Bering and southern Chukchi seas. – Pp. 217-245 in: *Investigations of the seas of the USSR*, 25. Gidrometeoizdat, Leningrad, Moscow.
- 1939. Phytoplankton of Malaya Pirju Inlet of the White Sea as an indicator of freshening influence of the Umba River. – Pp. 201-216 in: *Works of the State Hydrological Institute*, 8. *Works of the White Sea Methodical Station*, 18.
- 1950. *Thecate flagellates (Dinoflagellata) of the seas and freshwater reservoirs of the USSR*. – USSR Academy of Sciences Publishing House, Moscow, Leningrad. 280 pp.
- 1957. The peculiarities in the distribution of phytoplankton in the White Sea. – Pp. 282-304 in: *Materials on the complex studies of the White Sea*, 1.
- 1960. A new form of *Peridinium africanum* Lemm. from Mezen Bay, the White Sea. – *Botanicheskie materialy Otdela sporovykh rasteniy Botanicheskogo instituta AN SSSR* (Botanical Materials of the Department of Sporous Plants, Botanical Institute, USSR Academy of Sciences, Leningrad) 13:43-46.
- 1970. On the algal flora of the Ob Inlet with supplement of some data on the algae of the lower Ob and Irtysh rivers. – Pp. 41-54 in: Popova, T.G. & L.N. Vasiljeva (eds). *Algae and fungi of Siberia and the Far East. Part 1(3)*. Nauka, Novosibirsk.
- Kofoid, C.A. & O. Swezy 1921. *The free-living unarmored Dinoflagellata*. University of California Press, Berkeley. 538 pp.
- Kokin, K.A., T.I. Koltsova & T.V. Khlebovich 1970. The composition and the dynamics of the phytoplankton along the Karelian coast of the White Sea. – *Botanicheskii zhurnal Akademii Nauk SSSR* (Botanical Journal, USSR Academy of Sciences) 55:499-509.
- Koltsova, T.I. 1971. *Ecological-floristic studies on phytoplankton of the White Sea*. – Synopsis of PhD Thesis. State University of Moscow, Moscow. 20 pp.
- Koltsova, T.I. & L.V. Iljash 1982. The distribution of phytoplankton in the coastal waters of the Taymyr Peninsula in relation to the hydrological conditions. – *Vodnye resursy* (Water Resources, USSR) 4:158-165.
- Larionov, V.V. 1992. Spatial structure of the phytoplankton community in the open sea. – Pp. 64-73 in: Kuznetsov, L.L. (eds). *Phytoplankton of the Barents Sea*. Murmansk Marine Biological Institute, Russian Academy of Sciences, Apatity.
- 1993. *Spatial distribution and successions of the phytoplankton species groups in the Barents Sea*. – Synopsis of Ph.D. Thesis. State University of Moscow, Moscow. 33 pp.
- 1995. Phytoplankton of the coastal zone of the Barents Sea. – Pp. 52-59 in: Matishov, G.G. (eds). *Environment and ecosystems of Novaya Zemlya. The archipelago and shelf*. Murmansk Marine Biological Institute, Russian Academy of Sciences, Apatity.
- Lebour, M.V. 1919-1922. Plymouth peridinians. I. *Diplopsalis lenticula* and its relatives. – *Journal of the Marine Biological Association of the United Kingdom* 12:795-812.
- 1925. *The dinoflagellates of northern seas*. – Marine Biological Association of the United Kingdom, Plymouth. 250 pp.
- Levander, K.M. 1916. Zur Kenntnis des Küstenplanktons im Weissen Meere. – *Meddelanden af Societas pro Fauna et Flora Fennica* 42:150-159.

- Likhacheva, N.E. 1991. Phytoplankton species composition in the River Nilma estuary (Kandalaksha Bay, White Sea). – Pp. 95-110 in: *Studies on phytoplankton in the monitoring system of the Baltic Sea and other seas of the USSR*. Moscow.
- Linko, A.K. 1907. *Studies on the composition and life of the plankton in the Barents Sea. Expedition for Fishery Research Near Murman Coast*. – Committee for the Aid to Pomors of the Russian North, St. Petersburg. 245 pp.
- 1912. Plankton near the West Murman coast in relation to the state of fisheries in 1903-1905. – Pp. 27-65 in: Breitfuss, L.L. (ed). *Transactions of the Murman Fishery Research Expedition of 1905*. Department of Agriculture, St. Petersburg.
- 1915. Plankton near the Western Murman coast in relation to the state of fisheries in 1906. – Pp. 49-69 in: Breitfuss, L.L. (ed.). *Transactions of the Murman Fishery Research Expedition of 1906*. Department of Agriculture, Petrograd.
- Makarevich, P.R. 1995. Phytoplankton of the coastal zone of the Kara Sea. – Pp. 46-52 in: Matishov, G.G. (ed.). *Environment and ecosystems of Novaya Zemlya. The archipelago and shelf* Murmansk Marine Biological Institute, Russian Academy of Sciences, Apatity.
- 1996. Phytoplankton communities. – Pp. 50-54 in: Matishov, G.G. (ed.). *Ecosystems, biological resources and anthropogenic contamination of the Pechora Sea*. Murmansk Marine Biological Institute, Apatity.
- Makarevich, P.R. & N.V. Druzhkov 1994. Comparative characteristics of the phytoplankton in the south-eastern Barents Sea and the south-western Kara Sea. – *Algologia*, Kiev 4:78-88.
- Makarevich, P.R., N.V. Druzhkov & Y.A. Bobrov 1991. Phytoplankton in the zone of the transformed Barents and White Sea water masses. – Pp. 121-126 in: *Studies on phytoplankton in the monitoring system of the Baltic Sea and other seas of the USSR*. Moscow.
- Makarevich, P.R. & T.I. Koltsova 1989. Microplankton. – Pp. 38-50 in: Matishov, G.G. (ed.). *Ecology and biological resources of the Kara Sea*. Murmansk Marine Biological Institute, Apatity.
- Makarevich, P.R. & V.V. Larionov 1992. Taxonomic composition of phytoplankton and history of the phytoplankton studies in the Barents Sea. – Pp. 17-51 in: Kuznetsov, L.L. (eds). *Phytoplankton of the Barents Sea*. Murmansk Marine Biological Institute, Russian Academy of Sciences, Apatity.
- Makarevich, P.R., V.V. Larionov & N.V. Druzhkov 1993. Mean weights of dominant phytoplankton species of the Barents Sea. – *Algologia*, Kiev 3:103-106.
- Marino, D., M. Montresor, L. Mazzela & V. Saggiomo 1994. Diatom flora in oval faecal pellets from Terra Nova Bay (Antarctica). – Pp. 229-240 in: Marino, D. & M. Montresor (eds). *Proceedings of the Thirteenth International Diatom Symposium*, Maratea, Italy, 1-7 September 1994. Biopress Ltd., Bristol.
- McLachlan, J.L., G.T. Boalch & R. Jahn 1997. Reinstatement of the genus *Exuviaella* (Dinophyceae, Prorocentrophycidae) and an assessment of *Prorocentrum lima*. – *Phycologia* 36:38-46.
- Mereschkowsky, C. von 1878. Studies on the protozoans of the North of Russia. – *Trudy Sankt-Peterburgskogo obshchestva estestvoispytateley* 8:203-391, pl. 1-3.
- 1879. Studien über Protozoen des nördlichen Russland. – *Archiv für Mikroskopische Anatomie und Entwicklung Geschichte* 16:153-248.
- Meunier, A. 1910. *Microplancton des Mers de Barents et de Kara*. Duc d'Orleans Campagne Arctique de 1907. – Bulens, Bruxelles. 355 pp., pl. 1-37.
- Mielck, W. 1917. Untersuchungsfahrt des Reichsforschungsdampfers "Poseidon" in das Barentsmeer im Juni und Juli 1913. Einleitung, Reisebericht und Auszug aus dem Tagebuch. – *Wissenschaftliche Meeresuntersuchungen, N.F., Abt. Helgoland* 13, 1:1-46.
- Mikhailovsky, G.E. & L.S. Zhitina 1989. Cryoplanktonic flora of the White Sea and its seasonal dynamics revealed by correlation analysis methods. – *Oceanology, USSR Academy of Sciences* 29:796-803.
- Moestrup, Ø. 1997. New issues in taxonomy. – *Harmful Algae News* 16:20-21.
- Okolodkov, Y.B. 1987. *Planktonic algae of the Chukchi Sea*. – Ph.D. Thesis. Komarov Botanical Institute, Russian Academy of Sciences, Leningrad. 262 pp.
- 1988a. Parasitic and epiphytic algae of the plankton of the Chukchi Sea. – *Novitates Systematicae Plantarum non Vascularium, Leningrad* 25:50-53.
- 1988b. On the planktonic flora of the East Siberian Sea. – *Novitates Systematicae Plantarum non Vascularium, Leningrad* 25:53-54.
- 1989. Ice algae of the East Siberian Sea in May 1987. – *Novitates Systematicae Plantarum non Vascularium, Leningrad* 26:36-41.
- 1992. Cryopelagic flora of the Chukchi, East Siberian and Laptev seas. – Pp. 28-43 in: *Proceedings of the NIPR Symposium on Polar Biology*, 5. National Institute of Polar Research, Tokyo, March 1992.
- 1993a. A checklist of algal species found in the East Siberian Sea in May 1987. – *Polar Biology* 13:7-11.
- 1993b. Algae in the annual sea ice at Hooker Island, Franz Josef Land, in August 1991. – *Polish Polar Research* 14:25-32.
- 1993c. Armoured dinoflagellates from the Norwegian, Greenland and Barents seas collected in the cruise of the RV "Oceania" in August 1992. – *Polish Polar Research* 14:321-330.
- 1993d. Dinoflagellates from the Norwegian, Greenland and Barents seas, and the Faroe-Shetland Islands area collected in the cruise of r/v "Oceania", in June-July 1991. – *Polish Polar Research* 14:9-23.
- 1996a. Vertical distribution of algae and nutrients in the first-year ice from the East Siberian Sea in May 1987. – *Botanicheskiy zhurnal Rossiyskoy Akademii Nauk* (Botanical Journal, Russian Academy of Sciences) 81:34-40.
- 1996b. Biogeography of Arctic-boreal and bipolar dinoflagellates. – *Botanicheskiy zhurnal Rossiyskoy Akademii Nauk* (Botanical Journal, Russian Academy of Sciences) 81:18-30.

- 1996c. Net phytoplankton from the Barents Sea and Svalbard waters (collected on the cruise of the research vessel “Geolog Fersman”, in July-September 1992), with emphasis on the *Ceratium* species as indicators of the Atlantic waters. – *Botanicheskiy zhurnal Rossiyskoy Akademii Nauk (Botanical Journal, Russian Academy of Sciences)* 81:1-9.
- 1996d. Biodiversity and taxonomy of phytoplankton and ice-algae (Phytoplankton and sea-ice algae collected from the Barents Sea during the cruise of the R/V “Lance”, in June 1995). – Pp. 31-44 in: Falk-Petersen, S. & H. Hop (eds). *Ecological processes in the marginal ice zone of the northern Barents Sea. ICE-BAR 1995, Cruise Report*. Norwegian Polar Institute, Tromsø.
- 1997a. Biodiversity of planktonic and sea-ice algae. – Pp. 17-20 in: Falk-Petersen, S., H. Hop & G. Pedersen (eds). *Ecological and physical processes in the marginal ice-zone during the summer melt period. The ICE-BAR 1996 cruise in the northern Barents Sea*. Norwegian Polar Institute, Tromsø.
- 1997b. A new combination and new species of *Gymnodinium*, *Gyrodinium* and *Protoperidinium* (Dinophyceae) from the Arctic and N.E. Atlantic. – *Botanicheskiy zhurnal Rossiyskoy Akademii Nauk (Botanical Journal, Russian Academy of Sciences)* 82:97-106.
- Okolodkov, Y.B. & J.D. Dodge 1995. Redescription of the planktonic dinoflagellate *Peridiniella danica* (Paulsen) comb. nov. and its distribution in the N.E. Atlantic. – *European Journal of Phycology* 30:299-306.
- 1996. Biodiversity and biogeography of planktonic dinoflagellates in the Arctic Ocean. – *Journal of Experimental Marine Biology and Ecology* 202:19-27.
- Palibin, I.V. 1903-1906. *Botanical results of the voyage on board the ice-breaker “Ermak” to the Arctic Ocean in the summer 1901*. – Petersburg. 128 pp.
- Popovskiy, J. & L.A. Pfister 1990. *Dinophyceae (Dinoflagellida)*. – Gustav Fischer Verlag, Jena, Stuttgart. 272 pp.
- Roukhiainen, M.I. 1962. Seasonality in the development of phytoplankton in the coastal waters of Eastern Murman. – *Reports of the Murmansk Marine Biological Institute* 4(8):11-18.
- 1966. Phytoplankton species composition of the Barents Sea. – Pp. 3-23 in: Galkin, Y.I. (ed). *Composition and distribution of the phytoplankton and benthos in the southern part of the Barents Sea*. Nauka, Moscow, Leningrad.
- Ryzhov, V.M. 1978. Seasonal dynamics of the phytoplankton development in the eastern Barents Sea. – *ICES, Council Meeting 1978/L: 8, Biol. Oceanogr. Committee*. 8 pp.
- 1985. Phytoplankton. – Pp. 100-105 in: *Life and conditions in the pelagial of the Barents Sea*. Publishing House of the Kola Branch of the Russian Academy of Sciences, Apatity.
- 1987. Phytoplankton in the Spitsbergen - Bear Island area in relation to oceanographic characteristics of water masses of different origin. – *ICES Symposium 1987*, N 105. 18 pp.
- 1988a. *The ecology and geography of the phytoplankton of the Barents Sea*. – Ph.D. Thesis. Murmansk Marine Biological Institute, Dalniiye Zelentsy. 105 pp.
- 1988b. *The ecology and geography of the phytoplankton of the Barents Sea*. Synopsis of the Ph. D. Thesis. Shirshov Institute of Oceanology, USSR Academy of Sciences, Moscow. 20 pp.
- 1990. The development of primary producers in the main water masses of the Barents Sea. – Pp. 65-84 in: Scarlato, O.A. & A.P. Alekseev (eds). *Biological resources of the shelf and marginal seas*. Nauka, Moscow.
- 1994. The role of primary producers in the functioning ecosystems in the European Arctic seas as illustrated by the example of the Barents Sea. – Pp. 49-72 in: Pavlov, D.S. (ed.). *Evolution of the ecosystems and biogeography of the European Arctic seas*. Nauka, St. Petersburg.
- Ryzhov, V.M. & L.K. Tsekhotskaya 1978. Some features of the ecology of *Peridinium depressum* and *Ceratium longipes* in the Barents Sea in spring. – *Reports of the Polar Institute for Fisheries and Oceanography, Murmansk* 40:118-124.
- Ryzhov, V.M., V.P. Rusanov & V.S. Latyshev 1984. Chemical-biological indication of the water bodies in the Chukchi Sea. – *Transactions of the Arctic and Antarctic Research Institute* 368:26-40.
- Saito, K. 1974. *Regional distribution of phytoplankton in the Chukchi Sea and northern part of the Bering Sea in summer, 1972*. – Master of Fisheries Science Thesis. Hokkaido University, Hakodate, Hokkaido. 52 pp.
- Saito, K. & A. Taniguchi 1978. Phytoplankton communities in the Bering Sea and adjacent seas. II. Spring and summer communities in seasonally ice-covered areas. – *Astoria* 1:27-35.
- Sarukhan-Bek, K.K., I.G. Radchenko & T.I. Koltsova 1991. Phytoplankton of the Chupa Bay (Kandalaksha Bay, White Sea). – Pp. 111-119 in: *Studies on phytoplankton in the monitoring system of the Baltic Sea and other seas of the USSR*. Moscow.
- Schiller, J. 1933. *Dinoflagellatae (Peridineae). Teil 1*. – Dr. Rabenhorst's Kryptogamen-Flora von Deutschland, Österreich und der Schweiz. Akademische Verlagsgesellschaft M.B.H., Leipzig. 617 pp.
- 1937. *Dinoflagellatae (Peridineae). Teil 2*. – Dr. Rabenhorst's Kryptogamen-Flora von Deutschland, Österreich und der Schweiz. Akademische Verlagsgesellschaft M.B.H., Leipzig. 590 pp.
- Semina, H.J. & O.M. Sergeeva 1983. Plankton flora and biogeographical character of the phytoplankton of the White Sea. – Pp. 3-17 in: Giljarov, M.S. & N.A. Pertsova (eds). *Ecology and physiology of animals and plants of the White Sea*. Moscow State University Publishing House, Moscow.
- Sergeeva, O.M. 1991. Phytoplankton distribution in the White Sea basin in July 1972 and August 1973. – Pp. 82-94 in: *Studies on phytoplankton in the monitoring system of the Baltic Sea and other seas of the USSR*. Moscow.
- Shirshov, P.P. 1936. Plankton as an indicator of the ice regime in the sea. – Pp. 59-73 in: *Scientific works of the expedition on board the ice-breaker “Krasin” in 1935*. Glavsevmorput, Leningrad.

- 1937. Seasonal phenomena in the life of phytoplankton of the polar seas in relation to the ice regime. – *Transactions of the Arctic Institute* 82:47-111.
- Sokolova, S.A. 1972. Phytoplankton near bird's bazaars of Novaya Zemlya. – Pp. 63-73 in: Golovkin, A.N. (ed.). *Peculiarities of biological productivity of waters near bird's bazaars in the north of Novaya Zemlya*. Nauka, Leningrad.
- Sournia, A. 1967. Le genre *Ceratium* (péridinien planctonique) dans le canal de Mozambique. Contribution à une révision mondiale. – *Vie et Milieu* 18:375-499.
- 1973. Catalogue des espèces et taxons infraspécifiques de dinoflagellés marins actuels publiés depuis la révision de J. Schiller. I. Dinoflagellés libres. – *Beiheft zum Nova Hedwigia* 48: i-xii, 1-92.
- 1978. Catalogue des espèces et taxons infraspécifiques de dinoflagellés marins actuels publiés depuis la révision de J. Schiller. III. (Complément). – *Revue Algologique*, N. S. 13:3-40.
- 1986. *Atlas du phytoplankton marin. Vol. I. Introduction, Cyanophycées, Dictyochophycées, Dinophycées et Raphidophycées*. – Éditions du Centre National de la Recherche Scientifique, Paris. 219 pp.
- Subba Rao, D.V. 1995. Life cycle and reproduction of the dinoflagellate *Dinophysis norvegica*. – *Aquatic Microbial Ecology* 9:199-201.
- Thronsen, J. 1970. Flagellates from Arctic waters. – *Nytt Magasin for Botanikk* 17:49-57.
- Usachev, P.I. 1935. The composition and distribution of phytoplankton in the Barents Sea, in the summer 1931. – *Transactions of the Arctic Institute* 21:5-94.
- 1946. Phytoplankton collected during the expedition on board the icebreaker "G. Sedov" 1937-1939. – Pp. 371-397 in: Bujnitskiy, V.K. (ed.). *Results of the Drifting Expedition of Glavsevmorput on board the icebreaker "G. Sedov" 1937-1940*. Glavsevmorput, Moscow, Leningrad.
- 1949. Microflora of polar ice. – *Transactions of the Institute of Oceanology, Russian Academy of Sciences* 3:216-259.
- 1961. Phytoplankton near the North Pole. – *Trudy Vsesoyuznogo Gidrobiologicheskogo Obschestva (Transactions of the USSR Hydrobiological Society)* 11:189-208.
- 1968. The phytoplankton of the Kara Sea. – Pp. 4-28 in: H.I.Semina (ed.). *Plankton of the Pacific Ocean*. Nauka, Moscow.
- Vasjutina, N.P. 1991. Phytoplankton of the Barents Sea in July-August 1977. – Pp. 127-134 in: *Studies on phytoplankton in the monitoring system of the Baltic Sea and other seas of the USSR*. Moscow.
- Vejko, E.V. 1990. Studies on the seasonal dynamics of phytoplankton in the mussel farm area in the Chupa Bay, Kandalaksha Bay, White Sea. – *Botanicheskii zhurnal Akademii Nauk SSSR (Botanical Journal, USSR Academy of Sciences)* 75:31-37.
- Virketis, M.A. 1957. Some data on zooplankton of the central Arctic Basin. – Pp. 238-342 in: *Materials of observations of the drifting station "North Pole-3" and "North Pole-4" in 1954-1955. Vol. 1. Morskoj transport*, Leningrad.
- Wiktor, J.M. & Y.B. Okolodkov 1995. Phytoplankton. – Pp. 1-295 in: Klekowski, R.Z. & J.M. Węslawski (eds). *Atlas of the marine flora of southern Spitsbergen*. Ossolineum, Gdańsk.
- Wulff, A. 1919. Ueber das Kleinplankton der Barentssee. – *Wissenschaftliche Meeresuntersuchungen, N.F., Abt. Helgoland* 13, 1:95-124.
- 1927. Ergebnisse der Untersuchungen des Wasserverhältnisse und die auf ihnen beruhende Planktonverteilung im Barentsmeere. – Pp. 243-280 in: Schulz B. & A. Wulff. *Hydrographische und planktologische Ergebnisse der Fahrt des Fischereischutzbootes "Zeiten" in das Barentsmeer im August-September 1926. Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, N.F., 3. Verlag von Otto Salle, Berlin*.
- 1929. Ergebnisse der Untersuchung des Oberflächenplanktons. – Pp. 313-353 in: Schulz B. & A. Wulff. *Hydrographie und Oberflächenplankton des westlichen Barentsmeeres im sommer 1927. Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, N.F., 4. Verlag von Otto Salle, Berlin*.
- Zabelina, M.M. 1930. Some new data on the phytoplankton of the Kara Sea. – Pp. 105-143 in: *Investigations of the seas of the USSR*, 13. Izdatelstvo Gosudarstvennogo gidrologicheskogo instituta, Leningrad.
- 1946. Phytoplankton in the south-western Kara Sea. – *Transactions of the Arctic Research Institute* 193:45-73.
- Zhitina, L.S. 1981a. Vertical distribution of the phytoplankton in the White Sea. – *Nauchnye doklady vysshej shkoly, Biologicheskije nauki* 1:63-68.
- 1981b. *Spatial distribution of the phytoplankton in the White Sea*. Synopsis of Ph.D. Thesis. State University of Moscow, Moscow, 22 p.
- 1982. Similar species groups of phytoplankton in the White Sea. – *Vestnik Moskovskogo Gosudarstvennogo Universiteta, ser. biologicheskaya* 2:50-56.
- 1986. Reproduction speed in some planktonic algae of the White Sea. – *Biologicheskije nauki (Biological Sciences, USSR)* 1:63-65.
- Zhitina, L.S., E.G. Kolosova, T.I. Koltsova, T.V. Polyakova & V.D. Fedorov 1988. Changes in the phytoplankton of the White Sea. – Pp. 55-68 in: *Biology of the ocean: 3rd Conference of the State University of Moscow. Studies of the World Ocean*. Moscow, 19-22 May 1986. Moscow.

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