MINISTERE DES AFFAIRES ECONOMIQUES

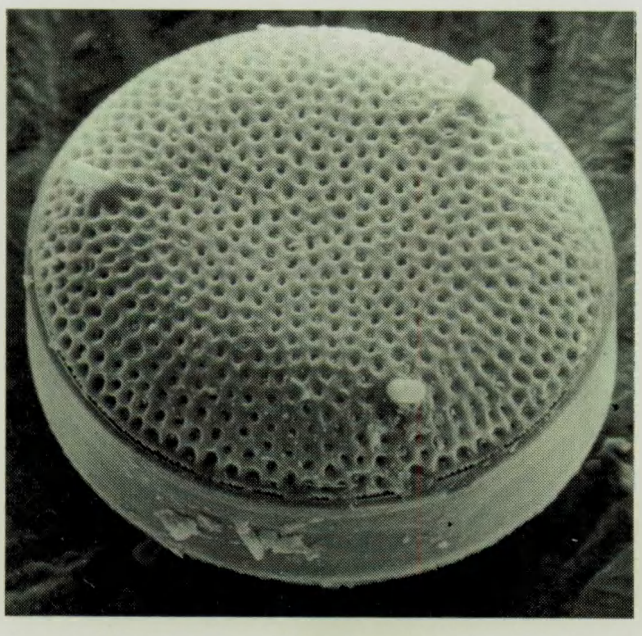
SERVICE GEOLOGIQUE DE BELGIQUE · BELGISCHE GEOLOGISCHE DIENST ·

MINISTERIE VAN ECONOMISCHE ZAKEN

A CHECK-LIST OF THE DIATOMS IN THE HOLOCENE DEPOSITS OF THE WESTERN BELGIAN COASTAL PLAIN WITH A SURVEY OF THEIR APPARENT ECOLOGICAL REQUIREMENTS

II. Centrales

by
Luc DENYS



PROFESSIONAL PAPER 1991/3 — N° 247

A CHECK-LIST OF THE DIATOMS IN THE HOLOCENE DEPOSITS OF THE WESTERN BELGIAN COASTAL PLAIN WITH A SURVEY OF THEIR APPARENT ECOLOGICAL REQUIREMENTS

II. Centrales

by
Luc DENYS

De Lescluzestraat, 68
B-2600 Berchem
BELGIUM

1. ENTRIES

ACTINOCYCLUS CHOLNOKYI Van Landingham

Hustedt (1930, fig. 218)

Synonyms: *Coscinodiscus divisus* Grun.
Actinocyclus curvatulus Janisch
Actinocyclus divisus (Grun.) Hust.

Lifeform: **planktonic** (Drebes & Elbrachter, 1976; Hendey, 1974; Mölder, 1943a; Moreira Filho & Valente Moreira, 1984; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974), **meroplanktonic** (Abrantes, 1988)

Salinity: **marine** (Hustedt, 1930; Moreira Filho & Valente Moreira, 1984), **marine-brackish** (Cleve-Euler, 1951-1955), **polyhalob.** (Foged, 1985a, 1985b; Moreira Filho & Valente Moreira, 1984), **euhalob., M** (Van der Werff & Huls, 1957-1974), **S >5.5 g/l** (Mölder, 1943a), **common at S 30-32 g/l** (van den Hoek et al., 1979), **euryhaline** (Moreira Filho & Valente Moreira, 1984)

Temperature: **cold** (Abrantes, 1988)

Distribution: **cosmopol.** (Foged, 1985a, 1985b)

Biotopes: **neritic** (Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **marine-littoral** (Hustedt, 1930; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974)

Code: **2-2-2-2-4 2-1-1-1-1 1-1-2-1-3**

ACTINOCYCLUS KUETZINGII (A. Schmidt) Simonsen

Hustedt (1930, fig. 209); John (1983, pl. 9, fig. 5)

Synonym: *Coscinodiscus kuetzingii* A. Schmidt

Lifeform: **planktonic** (Hendey, 1974; Rao & Lewin, 1976?; Vos & de Wolf, 1988), **planktonic-benthic** (Van der Werff, 1960), **benthic** (Cleve-Euler, 1944, 1951-1955; van den Hoek et al., 1979)

Salinity: **saline** (Mölder, 1943b, 1962), **marine** (Brockmann, 1928; Cleve-Euler, 1951-1955; Vos & de Wolf, 1988), **brackish** (Brockmann, 1954), **polyhalob.** (Foged, 1986a), **mesohalob.** (Brockmann, 1954), **M** (Van der Werff, 1960), **Sopt. at least 3 g/l** (Mölder, 1943b), **S 5-18 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Moreira Filho & Valente Moreira, 1984; Valente-Moreira & Moreira Filho, 1982)

Distribution: **cosmopol.** (Foged, 1986a)

Biotopes: **neritic** (Hendey, 1964; Van der Werff, 1960), **marine-littoral** (Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **estuarine**

Code: **4-2-3-3-5 2-1-1-1-1 1-0-2-1-2**

ACTINOCYCLUS NORMANII (Greg.) Hust. **f. SUBSALSUS** (Juhlin-Dannfelt) Hust.

Hustedt (1930, fig. 212)

Synonyms: *Coscinodiscus subsalsus* Juhlin-Dannfelt
Coscinodiscus rothii var. *subsalsum* (Juhlin-Dannfelt) Hust.

Lifeform: **planktonic** (Behre, 1956; Cholnoky, 1968a; Huber-Pestalozzi, 1942; Juggins, 1988; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974), **planktonic-epontic** (König, 1974)

Salinity: **saline** (Hustedt, 1942a), **brackish** (Cholnoky, 1968a; Cleve-Euler, 1951-1955; Hustedt, 1930; König, 1974; Van der Werff & Huls, 1957-1974), **weakly brackish** (Cleve-Euler, 1951-1955), **upper brackish to fresh** (Brockmann, 1954), **mesohalob.** (Van der Werff & Huls, 1957-1974), **halophil.** (Foged, 1965, 1970; Hustedt, 1939; Möller, 1950), **oligohalob. indif.** (Brockmann, 1954), **B** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **oligohalob. pleioeuryhaline** (Pankow, 1976?), **very abundant at Cl 32.2 mg/l** (Behre, 1956), **S <0.5-32 g/l** (van den Hoek et al., 1979), **euryhaline** (Hustedt, 1942a)

pH: **alkaliphil.** (Foged, 1965, 1970), **(6-)7-9** (Behre, 1956)

Biotopes: **marine-littoral, estuarine** (Huber-Pestalozzi, 1942), **also inland waters**

Code: **2-8-9-5-11 2-4-2-5-0 0-1-2-0-3**

ACTINOCYCLUS OCTONARIUS Ehr.

Hustedt (1930, fig. 298); Hendey (1964, pl. 24, fig. 3)

Synonym: *Actinocyclus ehrenbergii* Ralfs

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Brockmann 1935, 1939, 1940, 1954; Hendey 1964, 1974; Hustedt, 1939; König, 1983; Körber-Grohne, 1967; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **often planktonic** (Hustedt, 1930), **rarely planktonic** (Van Meel, 1965), **tychoplanktonic** (Cleve-Euler, 1951-1955), **planktonic-benthic** (Pankow, 1976; von Stosch, 1956), **benthic** (Van der Werff, 1960), **planktonic-epontic** (König, 1974)

Salinity: **saline** (Mölder, 1962), **marine** (Brockmann, 1928, 1930, 1932; Conrad & Kufferath, 1954; Ehrlich, 1975; Grohne, 1959; Hustedt, 1930; König, 1974; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente-Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Van Meel, 1965; von der Brelie, 1956; Vos & de Wolf, 1988), **marine to brackish** (Bakker & De Pauw, 1974; Brockmann, 1934, 1954; Cleve-Euler, 1951-1955; Hustedt, 1955; Körber-Grohne, 1967; Mölder & Tynni, 1968), **marine to weakly brackish** (Brockmann, 1939, 1940), **brackish** (König, 1983), **very abundant in brackish** (Bakker & De Pauw, 1974), **lower brackish** (Brockmann, 1940), **polyhalob.** (Foged, 1985a, 1986b, 1987; Hustedt, 1957; Ricard, 1977; Simonsen, 1962), **euhalob.** (Möller, 1950; Van der Werff & Huls, 1957-1974), **eu- to mesohalob.** (Brockmann, 1954), **mesohalob.** (Brockmann, 1940), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. me-**

so- to meioeuryhaline (Pankow, 1976), **Sopt. about 6 g/l, S >4 g/l** (Mölder, 1943a), **S 32-0.5 g/l, mainly 32-18 g/l** (van den Hoek et al., 1979), **S rarely <10 g/l** (Brockmann, 1954), **S rather high** (Van Meel, 1965), **Cl 6000-14000 mg/l** (Bakker & de Pauw, 1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **stenohaline** (Ehrlich, 1975), **strongly euryhaline** (Bakker & De Pauw, 1974; Conrad & Kufferath, 1954), **euryhaline** (Cleve-Euler, 1951-1955; Ricard, 1977)

Temperature: **warm meso-eurythermal** (Baars, 1979), **cryophil.** (Margalef, 1956), **eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Navarro, 1981a; Foged, 1985a, 1986b)

Biotopes: **oceanic** (Moreira Filho & Valente Moreira, 1984; Valente-Moreira & Moreira-Filho, 1982), **neritic** (Drebes & Elbrachter, 1976; Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982; Van der Werff, 1960; Van Meel, 1965), **marine-littoral** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hustedt, 1930; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **estuarine** (Van Meel, 1965), **mainly on mud** (Conrad & Kufferath, 1954)

Code: **4-3-4-3-4 2-1-1-1-1 1-0-2-1-2**

ACTINOCYCLUS OCTONARIUS var. CRASSUS (W. Sm.) Hendey

Hustedt (1930, fig. 301)

Synonyms: *Actinocyclus crassus* V. H.
Actinocyclus ehrenbergii var. *crassus* (W. Sm.) Hust.

Lifeform: **planktonic** (Hendey, 1964, 1974), **planktonic-benthic** (Pankow, 1976), **epontic** (Navarro, 1982)

Salinity: **marine** (Brockmann, 1928, 1930, 1932, 1934), **marine to brackish** (Hustedt, 1955; Mölder & Tynni, 1968), **marine to nearly fresh** (Cleve-Euler, 1951-1955), **euhalob.** (Berg, 1952), **mesohalob.** (Hustedt, 1939), **polyhalob. meso- to meioeryhaline** (Pankow, 1976), **S 35 g/l** (Navarro, 1982)

Biotopes: **neritic** (Hendey, 1964), **marine-littoral, estuarine, subtidal** (Navarro, 1982)

Note: Hendey (1967) and Hustedt (1930) do not consider this taxon as a separate variety

Code: **4-3-4-3-4 2-1-1-1-1 1-0-2-1-2**

ACTINOCYCLUS OCTONARIUS var. TENELLUS (Bréb.) Hendey

Hustedt (1930, fig. 302)

Synonym: *Actinocyclus ehrenbergii* var. *tenellus* (Bréb.) Hust.

Lifeform: **planktonic** (Hendey, 1964, 1974; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **planktonic-benthic** (Pankow, 1976), **epontic** (Navarro, 1982)

Salinity: **marine** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira-Filho, 1982), **marine to brackish** (Cleve-Euler, 1951-1955), **polyhalob. meso- to meioeuryhaline** (Pankow, 1976), **euryhaline** (Ricard, 1977), **S 40-26 g/l** (Navarro, 1982)

Temperature: **eurythermal** (Ricard, 1977)

Biotopes: **neritic** (Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **subtidal, intertidal** (Navarro, 1982), **marine-littoral, estuarine**

Note: Hustedt (1930) does not consider this taxon as a separate variety

Code: **4-3-4-3-4 2-1-1-1-1 1-0-2-1-3**

ACTINOCYCLUS SUBTILIS (Greg.) Ralfs

Foged (1986a, pl. 6, fig. 4); Hustedt (1930, fig. 304)

Lifeform: **planktonic** (Gasse et al., 1987; Hendey, 1974)

Salinity: **marine** (Brockmann, 1928; Cleve-Euler, 1951-1955; Gasse et al., 1987; Hustedt, 1930), **marine to strongly brackish** (Giffen, 1973), **marine to brackish** (John, 1983), **brackish** (Giffen, 1971), **brackish to fresh** (Giffen, 1970a), **polyhalob.** (Foged, 1985b, 1986a), **poly- to mesohalob., Sopt. 30-40 g/l** (Gasse et al., 1987), **euryhaline** (Ricard, 1977)

pH: **opt. 8-8.5** (Gasse et al., 1987)

Temperature: **warm** (Cleve-Euler, 1951-1955), **eurythermal** (Ricard, 1977)

Distribution: **less to the N** (Hustedt, 1930), **cosmopol.** (Foged, 1985b, 1986a)

Biotopes: **marine-littoral** (Giffen, 1973; Hustedt, 1930), **estuarine** (Giffen, 1971, 1973)

Code: **2-4-3-3-0 2-1-1-1-1 1-1-2-1-3**

ACTINOPTYCHUS SENARIUS (Ehr.) Ehr.

Hustedt (1930, fig. 264); Hendey (1964, pl. 23, fig. 1-2)

Synonym: *Actinoptychus undulatus* (Bailey) Ralfs

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Brockmann, 1935, 1940; Giffen, 1975; Hendey, 1951, 1964, 1974; Hustedt, 1939, 1957; Hustedt & Aleem, 1951; Körber-Grohne, 1967; Shaffer & Sullivan, 1988; Simonsen, 1962; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **rarely planktonic** (Hustedt, 1930), **tychoplanktonic** (Cleve-Euler, 1951-1955; Navarro, 1981a), **meroplanktonic** (Abrantes, 1988; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **planktonic-benthic** (Pankow, 1976; van den Hoek et al., 1979; Van der Werff, 1960; von Stosch, 1956), **planktonic-epontic** (König, 1974), **epontic** (Navarro, 1982)

Salinity: **saline** (Mölder, 1962), **marine** (Brockmann, 1928, 1930, 1932; Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954; Grohne, 1959; Heck & Brockmann, 1950; König, 1974; Mölder & Tynni, 1968; von der Brelie, 1956; Vos & de Wolf, 1988), **marine to brackish**

(Bakker & De Pauw, 1974; Brockmann, 1934, 1940; Körber-Grohne, 1967; Navarro, 1981a; Van der Werff & Huls, 1957-1974), **brackish** (Brockmann, 1935), **polyhalob.** (Foged, 1981, 1985a, 1986a, 1987; Hustedt, 1957; Ricard, 1977; Simonsen, 1962), **euhalob.** (Berg, 1952; Conrad & Kufferath, 1954), **eu- to mesohalob.** (Hustedt, 1939), **mesohalob.** (Brockmann, 1940; Valente Moreira & Moreira Filho, 1982), **M** (Van der Werff, 1954), **MB** (Munda, 1967; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976), **S 26-40 g/l** (Navarro, 1982), **S 32-0.5 g/l, mainly 32-5 g/l** (van den Hoek et al., 1979), **Cl down to about 3500 mg/l** (Van der Werff & Huls, 1957-1974), **Cl 6000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **strongly euryhaline** (Conrad & Kufferath, 1954; Van der Werff & Huls, 1957-1974), **euryhaline** (Hustedt, 1939; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Ricard, 1977; Valente Moreira & Moreira Filho, 1982)

Temperature: **cryophil.** (Margalef, 1956), **eu-mesothermal eurythermal** (Ricard, 1977), **warm meso-eurythermal** (Baars, 1979)

Distribution: **northern temperate** (Mölder & Tynni, 1968), **cosmopol.** (Foged, 1985a, 1986a, 1987; Hustedt, 1955; Navarro, 1981a)

Biotopes: **oceanic** (Hendey, 1964), **neritic** (Drebes & Elbrachter, 1976; Hendey, 1964; Navarro, 1981a; Van der Werff, 1960), **marine-littoral** (Drebes & Elbrachter, 1976; Giffen, 1975; Hendey, 1970; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **tidal flat** (König, 1959, Riznyk, 1973), **mainly on mud** (Conrad & Kufferath, 1954), **subtidal, intertidal, supratidal** (Navarro, 1982), **estuarine**

Code: **3-4-3-3-3 2-1-1-1-1 1-4-2-1-3**

ACTINOPTYCHUS SPLENDENS (Shadb.) Ralfs

Hustedt (1930, fig. 265); Hendey (1964, pl. 22, fig. 1); John (1983, pl. 10, fig. 5-9)

Lifeform: **planktonic** (Giffen, 1973; Hendey, 1974; Körber-Grohne, 1967; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **meroplanktonic** (Abrantes, 1988), **planktonic-benthic** (John, 1983; van den Hoek et al., 1979), **epontic** (Navarro, 1982; von Stosch, 1956)

Salinity: **marine** (Brockmann, 1928, 1932, 1934; Cleve-Euler, 1951-1955; Grohne, 1959; Heck & Brockmann, 1950; Hustedt, 1930; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **not in brackish** (Brockmann, 1940), **marine to brackish** (John, 1983; Körber-Grohne, 1967), **polyhalob.** (Foged, 1986a, 1987; Hustedt, 1957; Moreira & Moreira-Filho, 1982; Ricard, 1977), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Munda, 1967; Van der Werff, 1954; Van der Werff & Huls, 1957-1974), **S 40-30 g/l** (Navarro, 1982), **S 32-18 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Ricard, 1977)

Temperature: **mesothermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1986a, 1987; Hustedt, 1955)

Biotopes: **marine-littoral** (Drebes & Elbrachter, 1976; Giffen, 1973; Hendey, 1964; Hustedt, 1930; Moreira & Moreira-Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **tidal flat** (König, 1959), **subtidal** (Navarro, 1982)

Code: **3-2-2-2-3 3-1-1-1-1 1-4-2-1-2**

ANAULUS BALTICUS Simonsen

Rao & Lewin (1976, fig. 85-89); Simonsen (1959, pl 10, fig. 1-3)

Lifeform: **tychoplanktonic** (Whiting & McIntire, 1985), **benthic** (Pankow, 1976; Whiting & McIntire, 1985), **epipelic** (Rao & Lewin, 1976), **epipsammic** (Vos, 1986)

Salinity: **marine** (Simonsen, 1959), **polyhalob. meioeuryhaline** (Pankow, 1976; Simonsen, 1962)

Biotopes: **estuarine tidal flat** (Riznyk, 1973), **salt-marsh** (Sullivan, 1978), **intertidal** (Rao & Lewin, 1976)

Code: **8-4-2-2-3 2-1-1-1-1 1-4-2-1-4**

ANAULUS CRETICUS Drebes & Schulz

Drebes & Schulz (1981, pl. 1-4, fig. 1-19)

Lifeform: **planktonic** (Drebes & Schulz, 1981)

Salinity: **marine** (Drebes & Schulz, 1981)

Distribution: **subtropical** (Drebes & Schulz, 1981)

Biotopes: **coastal waters** (Drebes & Schulz, 1981)

Code: **2-2-2-2-0 0-1-1-1-1 1-1-2-1-4**

AULACODISCUS ARGUS (Ehr.) A. Schmidt

Hustedt (1930, fig. 281)

Synonym: *Eupodiscus argus* (Ehr.) W. Sm.

Lifeform: **planktonic** (Hendey, 1974; Hustedt, 1939; Körber-Grohne, 1967; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **also planktonic** (Cleve-Euler, 1951-1955; Hustedt, 1930; Van der Werff & Huls, 1957-1974), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960), **planktonic-epontic** (König, 1974), **epontic** (von Stosch, 1956)

Salinity: **marine** (Brockmann, 1928; Cleve-Euler, 1951-1955; Grohne, 1959; Hustedt, 1930; König, 1974; Körber-Grohne, 1967; Ricard, 1987; von der Brelie, 1956; Vos & de Wolf, 1988), **polyhalob.** (Hustedt, 1957), **euhalob.** (Conrad & Kufferath, 1954; Hustedt, 1939; Van Meel, 1965), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **S 32-18 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **rather euryhaline** (Van der Werff & Huls, 1957-1974), **euryhaline** (Conrad & Kufferath, 1954; Van Meel, 1965)

Distribution: **cosmopol.** (Ricard, 1987)

Biotopes: **neritic** (Cleve-Euler, 1951-1955; Hendey, 1964; Ricard, 1987; Van der Werff, 1960), **marine-littoral** (Conrad & Kufferath, 1954; Drebes & Elbrachter, 1976; Hustedt, 1930; Van der Werff & Huls, 1957-1974; Van Meel, 1965; Vos & de Wolf, 1988)

Code: **3-2-2-2-3 3-1-1-1-1 1-0-2-1-2**

AULACOSEIRA AMBIGUA (Grün.) Simonsen

Gasse (1986, pl. 1, fig. 12-17); Germain (1981, pl. 3, fig. 5-7); Hustedt (1930, fig. 108)

Synonym: *Melosira ambigua* (Grun.) Müller

Lifeform: **planktonic** (Behre, 1956; Cleve-Euler, 1951-1955; Foged, 1951; Germain, 1936, 1981; Gasse, 1986, 1987; Hustedt, 1938, 1942a, 1945, 1946, 1950, 1957, 1959; Kalbe, 1973; Maillard, 1977; Mölder & Tynni, 1967; Symoens, 1957; van den Hoek et al., 1979; Vos & de Wolf, 1988), **mainly planktonic** (Bradbury, 1975; Huber-Pestalozzi, 1942; Hustedt, 1930)

Salinity: **fresh** (Hustedt, 1925; Mölder, 1943a, 1962; Vos & de Wolf, 1988), **fresh to brackish** (Florin, 1957), **fresh to weakly brackish** (Germain, 1981), **oligohalob.** (Hustedt, 1939, 1957; Simonsen, 1962), **oligohalob. indif.** (Brockmann, 1954; Foged, 1954, 1968a, 1981; Kolbe, 1927), **FB** (Van der Werff & Huls, 1957-1974), **oligohalob. meioeuryhaline** (Pankow, 1976), **S 30-<0.5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **mainly S <0.5 g/l** (Gasse, 1987), **Cl 0-500 mg/l** (Vos & de Wolf, 1988)

Conductivity: **26-12540 µS/cm** (Bradbury, 1975), **<300->10000 µS/cm** (Gasse, 1986)

pH: **alkaliphil. to alkalib.** (Kalbe, 1973), **alkaliphil.** (Budde, 1942; Dixit et al., 1988; Foged, 1968a, 1981; Hustedt, 1957), **indif.** (Charles, 1985; Foged, 1954), **weakly alkaline, opt. probably slightly <7.9** (Cholnoky, 1968a), **mainly 6.6-8.9** (Foged, 1977), **mainly 5-7** (Mölder & Tynni, 1967), **AWM 6.8** (Dixit et al., 1988), **6->9.5, mainly 6.5-8** (Gasse, 1986), **5.8-9** (Behre, 1956), **6.4-7.8** (Charles, 1985)

Alkalinity: **very low to very high, mainly rather low** (Gasse, 1986)

Trophic conditions: **strongly eutroph.** (Hustedt, 1957, 1959), **eutroph.** (Bradbury, 1973; Brockmann, 1939; Foged, 1955; Hustedt, 1930; Kalbe, 1973; Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974), **eutroph. if dominant, meso- to eutroph.** (Battarbee, 1984), **oligo- to eutroph.** (Huber-Pestalozzi, 1942; Hustedt, 1938), **dys- to eutroph.** (Cleve-Euler, 1951-1955)

Saprobity: **oligosaprob.** (Hustedt, 1957; Kalbe, 1973), **oligo- to ß-mesosaprob.** (Sladecek, 1973)

Oxygen: **mesooxybiont.** (Hustedt, 1957)

Current: **indif.** (Foged, 1954), **limnobiont.** (Gasse, 1986)

Temperature: **high** (Shear et al., 1976), **mainly 20-28 °C, rather narrow limits** (Gasse, 1986)

Light: **high requirement** (Shear et al., 1976)

Biotopes: **marsh-soils** (Cleve-Euler, 1951-1955), **various waterbodies with not too strong currents**

Code: **2-12-14-9-9 3-5-2-5-6 3-1-2-4-3**

AULACOSEIRA DISTANS (Ehr.) Simonsen

Germain (1981, pl. 3, fig. 9-13); Hustedt (1930, fig. 110, a-f, i)

Synonym: *Melosira distans* (Ehr.) Kütz.

Lifeform: **planktonic** (Cholnoky, 1970; Germain, 1981; Maillard, 1977; van den Hoek et al., 1979), **rarely planktonic** (Mölder & Tynni, 1967), **benthic** (Foged, 1964; Hustedt, 1930), **epilithic-epipelic** (Gasse, 1987), **mainly epipelic, also epontic** (Moore, 1975)

Salinity: **fresh** (Conrad & Kufferath, 1954; Mölder, 1962; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **oligohalob. indif.** (Foged, 1954), **halophob.** (Brockmann, 1954; Conrad & Kufferath, 1954; Foged, 1964, 1970, 1981; Hustedt, 1957), **F** (Van der Werff & Huls, 1957-1974), **Sopt. 0.5 g/l, Smax. 4 g/l** (Mölder, 1943a), **S <0.5 g/l** (Gasse, 1987), **S 30-<0.5 g/l** (van den Hoek et al., 1979)

pH: **acid** (Brugam, 1983; Round, 1964; Salden, 1978), **weakly acid to neutral** (Foged, 1950), **moderately alkaline** (Cholnoky, 1970), **acidobiont.** (Hustedt, 1942b), **acidophil.** (Charles, 1985; Dixit et al., 1988; Foged, 1964, 1970, 1972, 1981; Hustedt, 1957; Jørgensen, 1948; Maillard, 1977; Moreira Filho & Valente Moreira, 1984; Sims, 1978; Valente-Moreira & Moreira Filho, 1982), **indif.** (Foged, 1954), **circumneut. to weakly alkaliphil.** (Fabri & Leclercq, 1984), **opt. about 6.5** (Cholnoky, 1968a), **AWM 6.2** (Dixit et al., 1988), **mainly 5.5-7.4** (Foged, 1968b), **mainly 4-6.5** (Foged, 1977), **mainly 7-7.9** (Gasse & Tekaia, 1983), **6-7.5(-9)** (Behre, 1956), **4.5-7.8** (Charles, 1985), **4->9** (Foged, 1977), **4.2-6.6** (Jørgensen, 1948), **3.5-4** (Terho, 1982)

Alkalinity: **soft water** (Bradbury, 1973)

Trophic conditions: **dystroph.** (Earle et al., 1986), **dys. to oligotroph.** (Foged, 1964), **oligotroph.** (Cleve-Euler, 1951-1955; Hustedt, 1937), **mainly oligotroph.** (Mölder & Tynni, 1967), **mesotroph.** (Fabri & Leclercq, 1984), **eutroph.** (Bradbury, 1973), **low P requirement** (Kilham et al., 1986)

Saprobity: **saproxen.** (Hustedt, 1957), **saproxen. to oligosaprob.** (Sladecek, 1973), **saprophil.** (Fabri & Leclercq, 1986), **saprophil. to saprobiont.** (Fabri & Leclercq, 1984)

Current: **indif.** (Foged, 1954)

Oxygen: **meso- to polyoxybiont.** (Fabri & Leclercq, 1986)

Temperature: **stenothermal cold** (Foged, 1950, 1964; Hustedt, 1930), **cold** (Brockmann, 1954)

Biotopes: **littoral** (Foged, 1950, 1964; Gasse, 1987; Hustedt, 1930; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984), **wet subaerial** (Krasske, 1932), **moist subaerial** (Krasske, 1948), **sometimes xerotic** (Bock, 1962, 1970), **various running and standing waters**

Code: **4-14-15-10-9 4-7-7-5-8 3-1-3-4-3**

AULACOSEIRA GRANULATA (Ehr.) Simonsen

Gasse (1986, pl. 1, fig. 5, 8); Germain (1981, pl. 3, fig. 1-3), Hustedt (1930, fig. 104, a-c, e-f)

Synonym: *Melosira granulata* (Ehr.) Ralfs

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Bradbury & Winter, 1976; Brockmann, 1954; Cholnoky, 1968a; Cleve-Euler, 1951-1955; Foged, 1950, 1951, 1964; Gasse, 1986, 1987; Gasse et al., 1987; Germain, 1936, 1981; Godward, 1937; Huber-Pestalozzi, 1942; Hustedt, 1930, 1935, 1938, 1939, 1946, 1950, 1957, 1959; Jørgensen, 1948; Juggins 1988; Kalbe, 1973; König, 1974; Krasske, 1932; Maillard, 1977; Mölder, 1943a; Mölder & Tynni, 1967; Salden, 1978; Schulz, 1928; Symoens, 1957; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974; von der Brelie, 1956; Vos & de Wolf, 1988), **mainly planktonic** (Bradbury, 1975; Foged, 1948), **planktonic-benthic** (Cholnoky, 1970; Van der Werff, 1960), **epiphytic** (Czarnecki & Blinn, 1978)

Salinity: **brackish** (Bakker & De Pauw, 1974), **brackish to fresh** (Florin, 1957; Moreira Filho & Valente Moreira, 1984; Van der Werff & Huls, 1957-1974), **weakly brackish to fresh** (Germain, 1981), **fresh** (Aleem, 1973; Brockmann, 1928, 1932, 1940; Ehrlich, 1975; Gasse, 1986; Gasse et al., 1987; Hustedt, 1925, 1930, 1938; König, 1974; Mölder, 1962; Valente Moreira & Moreira Filho, 1982; von der Brelie, 1956; Vos & de Wolf, 1988), **weakly meso- to oligohalob.** (Van der Werff & Huls, 1957-1974), **oligohalob.** (Ehrlich, 1975; Hustedt, 1939, 1957; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982), **oligohalob. indif.** (Bradler, 1935; Brockmann, 1954; Foged, 1948, 1949, 1954, 1964, 1965, 1968a, 1970, 1981, 1985a, 1985b, 1986a, 1987; Gasse et al., 1987; Kolbe, 1927), **halophob.** (Cleve-Euler, 1951-1955), **FB** (Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **oligohalob. meio-euryhaline** (Pankow, 1976; Simonsen, 1962?), **Sopt. 0-0.5 g/l** (Gasse et al., 1987), **Sopt. 1.2-3.8 g/l** (Mölder, 1943a), **Sopt. 0.8 g/l** (Mölder & Tynni, 1967), **mainly S <0.5 g/l** (Gasse, 1987), **S 0-10 g/l** (Gasse et al., 1987), **S 30-<0.5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **Cl 6000-10000 mg/l** (Bakker & De Pauw, 1974), **Cl 17-159 mg/l** (Foged, 1948), **Cl 0-500 mg/l** (Vos & de Wolf, 1988)

Conductivity: **26-12540 µS/cm** (Bradbury, 1975), **249-340 µS/cm** (Czarnecki & Blinn, 1978), **most at <3000 µS/cm** (Fritz & Battarbee, 1988), **<300->10000 µS/cm, mainly <1000 µS/cm** (Gasse, 1986)

pH: **alkaline** (Cholnoky, 1970; Round, 1964), **alkaliphil.** (Foged, 1948, 1949, 1954, 1965, 1968a, 1970, 1972, 1981, 1985a, 1985b, 1986a, 1987; Hustedt, 1957; Jørgensen, 1948; Maillard, 1977; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **alkaliphil.-alkalibiont.** (Kalbe, 1973), **opt. 7.9-8.2** (Cholnoky, 1968a; Gasse et al. 1987), **mainly 6-<8.5** (Gasse, 1986), **mainly 8-8.6** (Gasse & Tekaia, 1983), **6.4-8.3** (Foged, 1948), **<4->9** (Foged, 1977), **6->9.5** (Gasse, 1986), **6.3->9** (Jørgensen, 1948), **4.5-6.5** (Mölder & Tynni, 1967), **3.5-6** (Niessen, 1956), **3-4** (Terho, 1982), **6.3->9** (Van der Werff & Huls, 1957-1974)

Alkalinity: **very low to very high, mainly low** (Gasse, 1986)

Calcium: **0-140 mg/l** (Niessen, 1956)

Trophic conditions: **oligo- to hypertroph.** (Van der Werff & Huls, 1957-1974), **oligo- to eutroph.** (Mölder & Tynni, 1967), **meso- to eutroph.** (Cleve-Euler, 1957-1974), **mainly**

eutroph. (Foged, 1964; Van der Werff & Huls, 1957-1974), **eutroph.** (Bradbury, 1975; Brockmann, 1939, 1940, 1954; Brugam, 1983; Foged, 1950, 1951; Huber-Pestalozzi, 1942; Hustedt, 1927a, 1930, 1938, 1946, 1957; Jørgensen, 1948; Kalbe, 1973; Krasske, 1932; Salden, 1978), **high P requirement** (Kilham et al., 1986)

Saprobity: **oligosaprob.** (Hustedt, 1957), **oligo- to mesosaprob.** (Van der Werff & Huls, 1957-1974), **mainly mesosaprob.** (Van der Werff & Huls, 1957-1974), **mesosaprob.** (Moreira Filho & Valente Moreira, 1984), **ß-mesosaprob.** (Cleve-Euler, 1951-1955; Kalbe, 1973; Sladecek, 1973)

Current: **rheophil.** (Czarnecki & Blinn, 1978), **limnophil.** (Foged, 1948, 1954)

Temperature: **not too warm** (Bradbury, 1973), **high** (Shear et al., 1976)

Distribution: **cosmopol.** (Foged, 1985a, 1985b, 1986a, 1987)

Light: **high requirement** (Shear et al., 1976)

Biotopes: **sometimes xerotic** (Bock, 1970; Krasske, 1932), **various more permanent waterbodies, both standing and running water**

Note: according to Cholnoky (1968a) the varieties that are distinguished in the literature cannot be kept separate

Code: **2-12-14-9-9 3-4-2-5-6 0-1-2-4-3**

AULACOSEIRA GRANULATA var. ANGUSTISSIMA (Müller) Simonsen

Germain (1981, pl. 3, fig. 4-5); Hustedt (1930, fig. 140 d)

Synonym: *Melosira granulata* var. *angustissima* Müller

Lifeform: **planktonic** (Brander, 1935; Cholnoky, 1958, 1968a; Foged 1951; Gasse, 1986, 1987; Huber-Pestalozzi, 1942; Hustedt, 1938, 1950, 1957, 1959; Jørgensen, 1948; Kalbe, 1973; Maillard, 1977; Symoens, 1957; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974)

Salinity: **brackish to fresh** (Florin, 1957; Moreira-Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **weakly brackish to fresh** (Van der Werff & Huls, 1957-1974), **fresh** (Brander, 1935; Mölder, 1943a), **meso- to oligohalob.** (Van der Werff & Huls, 1957-1974), **oligohalob.** (Hustedt, 1939, 1957), **oligohalob. indif.** (Foged, 1948, 1949, 1954, 1968a, 1970, 1981), **oligohalob. meioeuryhaline** (Pankow, 1976), **FB** (Van der Werff & Huls, 1957-1974), **mainly S <0.5 g/l** (Gasse, 1987), **S 5-<0.5 g/l** (van den Hoek et al., 1979), **Cl 17-159 mg/l** (Foged, 1948)

Conductivity: **opt. 500-1200 µS/cm, <300->10000 µS/cm** (Gasse, 1986)

pH: **mainly acid** (Mölder & Tynni, 1967), **weakly alkaline** (Cholnoky, 1958), **alkaliphil.** (Foged, 1948, 1949, 1954, 1968a, 1970, 1972, 1981; Hustedt, 1957; Jørgensen, 1948; Maillard, 1977; Moreira-Filho & Valente Moreira, 1984; Valente Moreira & Moreira-Filho, 1982; Van der Werff & Huls, 1957-1974), **alkaliphil. to alkalibiont.** (Kalbe, 1973), **opt. 7.9-8.2** (Cholnoky, 1968a), **6->9.5, opt. 8-8.5, abundant at 6-<9.5** (Gasse, 1986), **mainly 7.6->9** (Foged, 1977), **mainly 8-8.6** (Gasse & Tekaia, 1983), **6.4-8.3** (Foged, 1948), **6.2->9** (Jørgensen, 1948), **3-4** (Terho, 1982), **6.3->9** (Van der Werff & Huls, 1957-1974)

Alkalinity: **very low to very high, mainly low** (Gasse, 1986)

Trophic conditions: **oligo- to hypertroph., mainly eutroph.** (Van der Werff & Huls, 1957-1974), **rather eutroph.** (Cholnoky, 1958), **eutroph.** (Bradbury, 1975; Cleve-Euler, 1951-1955; Foged, 1951; Hustedt, 1938, 1957; Jørgensen, 1948; Kalbe, 1973)

Saprobity: **oligosaprob.** (Hustedt, 1957), **oligo- to mesosaprob., mainly mesosaprob.** (Van der Werff & Huls, 1957-174), **ß-mesosaprob.** (Kalbe, 1973; Sladecek, 1973)

Current: **limnobiont.** (Foged, 1948, 1954)

Light: **tolerates high turbidity** (Gasse, 1986)

Biotopes: **sometimes xerotic** (Bock, 1970), **various more permanent waterbodies with not too strong currents**

Code: **2-12-14-9-9 3-4-2-5-6 0-1-2-4-3**

AULACOSEIRA GRANULATA var. MUZZAZENSIS (Meister) Simonsen

Gasse (1986, pl. 1, fig. 7); Huber-Pestalozzi (1942, pl. 110, fig. 454); Hustedt (1930, fig. 105)

Synonym: *Melosira granulata* var. *muzzazensis* (Meister) Bethge

Lifeform: **planktonic** (Cholnoky, 1968a; Huber-Pestalozzi, 1942)

Conductivity: **opt. 40-120 µS/cm, <300-<1000 µS/cm** (Gasse, 1986)

pH: **opt. 7.9-8.2** (Cholnoky, 1968a), **opt. 6.5-6.9, 6-<8.5** (Gasse, 1986)

Alkalinity: **low** (Gasse, 1986)

Trophic conditions: **eutroph.** (Huber-Pestalozzi, 1942)

Biotopes: **various more permanent waterbodies with not too strong currents**

Note: data from Gasse (1986) include *Aulacoseira granulata* var. *jonensis* (Grun.) Simonsen

Code: **2-12-14-9-9 4-3-2-5-0 0-1-2-4-3**

AULACOSEIRA ISLANDICA (Müller) Simonsen
AULACOSEIRA ISLANDICA subsp. HELVETICA (Müller) Simonsen
AULACOSEIRA ISLANDICA subsp. ISLANDICA (Müller) Simonsen

Hustedt (1930, fig. 106, 107)

Synonyms: *Melosira islandica* Müller
Melosira islandica subsp. *islandica* Müller
Melosira islandica subsp. *helvetica* Müller

Lifeform: **planktonic** (Behre, 1956; Brander, 1935; Cleve-Euler, 1951-1955; Huber-Pestalozzi, 1942; Hustedt, 1930, 1946, 1950; Jørgensen, 1948; Kalbe, 1973; Mölder, 1943a; Mölder & Tynni, 1967; Simonsen, 1962), **epontic** (König, 1983)

Salinity: **brackish to fresh** (Florin, 1957), **weakly brackish to fresh** (Mölder & Tynni, 1967), **fresh** (Brander, 1935; Hustedt, 1925, 1930; König, 1983; Mölder, 1962), **oligohalob.** (Simonsen, 1962), **oligohalob. indif.** (Berg, 1952; Brockmann, 1954; Foged, 1949, 1968a, 1970, 1981, 1985a, 1986a; Petersen, 1943?; Schulz 1928), **halophob.** (Cleve-Euler, 1944, 1951-1955), **FB-F** (Van der Werff & Huls, 1957-1974), **oligohalob. meioeuryhaline** (Pankow, 1976), **Sopt. 0 g/l** (Cleve-Euler, 1944), **Sopt. <3 g/l** (Mölder, 1943a), **Sopt. 0.17 g/l** (Mölder & Tynni 1967), **S 0-0.5 g/l** (Cleve-Euler, 1944)

pH: **alkaliphil.** (Foged, 1949, 1968a, 1970, 1972, 1981, 1985a, 1986a), **alkalibiont.** (Jørgensen, 1948), **opt. <7** (Cholnoky, 1968a?), **mainly 3.5-4** (Terho, 1982), **7-9** (Behre, 1956), **7.5-9** (Jørgensen, 1948), **7-7.4** (Louis & Peeters, 1967), **4-8** (Mölder & Tynni, 1967), **3-4.5** (Terho, 1982)

Trophic conditions: **eurytopic** (Bradbury, 1975), **dystroph.** (Earle et al., 1986), **oligotroph.** (Bradbury, 1973; Round, 1960), **oligo- to mesotroph.** (Van der Werff & Huls, 1957-1974), **oligo- to eutroph.** (Huber-Pestalozzi, 1942; Hustedt, 1930; Mölder & Tynni, 1967), **meso- to eutroph.** (Cleve-Euler, 1951-1955), **mainly eutroph.** (Huber-Pestalozzi, 1942; Hustedt, 1930), **eutroph.** (Kalbe, 1973; Pankow, 1976)

Saprobity: **oligosaprob.** (Van der Werff & Huls, 1957-1974), **oligo- to mesosaprob.** (Cleve-Euler, 1951-1955), **ß-mesosaprob.** (Kalbe, 1973; Sladecek, 1973)

Oxygen: **rather high** (Hustedt, 1930?)

Current: **limnophil.** (Schulz, 1928)

Temperature: **cold eurythermal** (Mölder & Tynni, 1967), **cold** (Bradbury, 1973), **rather low** (Hustedt, 1930), **low** (Shear et al., 1976)

Distribution: **cosmopol.** (Foged, 1985a, 1986a)

Light: **low requirement** (Shear et al., 1976)

Biotopes: **various more permanent waters with not too strong currents**

Note: according to Cholnoky (1968a) the infraspecific taxa cannot be separated

Code: **2-13-14-9-9 4-4-10-5-6 3-1-2-4-3**

AULACOSEIRA ITALICA (Ehr.) Simonsen

Germain (1981, pl. 7-8); Hustedt (1930, fig. 109 c-d)

Synonym: *Melosira italica* (Ehr.) Kütz.

Lifeform: **planktonic** (Hustedt, 1946; Juggins, 1988; Mölder, 1943a; Symoens, 1957; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **mainly planktonic** (Bradbury, 1975; Cleve-Euler, 1951-1955), **also planktonic** (Mölder & Tynni, 1967), **benthic** (Huber-Pestalozzi, 1942), **epilithic-epipelic** (Gasse, 1987), **metaphytic** (Behre, 1956)

Salinity: **weakly brackish to fresh** (Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974), **fresh** (Aleem, 1973; Brockmann, 1935, 1940, 1941; Hustedt, 1925, 1927b, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; von der Brelie, 1956; Vos & de Wolf, 1988), **weakly mesohalob. to oligohalob.** (Van der Werff & Huls, 1957-1974), **oligohalob.** (Hustedt, 1939, 1957; Valente Moreira & Moreira Filho, 1982), **oligohalob. indif.** (Brockmann, 1954; Foged, 1954, 1970, 1981; Kolbe, 1927; Schulz, 1928), **rather halophob.** (Hustedt, 1957), **halophob.** (Cleve-Euler, 1951-1955), **FB** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **Sopt. 0.5-3 g/l, S <6 g/l** (Mölder, 1943a), **mainly S <0.5 g/l** (Gasse, 1987), **Cl 4-64 mg/l, opt. 8-32 mg/l** (Leclercq, 1984), **Cl 0-500 mg/l** (Vos & de Wolf, 1988)

Conductivity: **opt. 140-210(-320) µS/cm, 50-320(-510) µS/cm** (Leclercq, 1984), **200-2000 µS/cm, mainly 200-1000 µS/cm** (Niessen, 1956), **26-144 µS/cm** (Bradbury, 1975)

pH: **acid** (Brugam, 1983), **circumneut.** (Foged, 1970), **indif.** (Foged, 1954), **indif. to alkaliphil.** (Hustedt, 1957), **circumneut. to weakly alkaliphil.** (Fabri & Leclercq, 1984), **circumneut. to alkaliphil.** (Foged, 1981; Leclercq, 1984), **weakly alkaliphil.** (Sims, 1978), **alkaliphil.** (Dixit et al., 1988; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira-Filho, 1982), **alkaliphil. to alkalibiont.** (Kalbe, 1973), **opt. >8** (Cholnoky, 1968a), **opt. (6.5-)7.5-8.5** (Leclercq, 1984), **mainly 5.5-7.4** (Foged, 1968b), **mainly 8-8.6** (Gasse & Tekaia, 1983), **5.7-9** (Behre, 1956), **4.5-8.5** (Leclercq, 1984), **3.5-8.5** (Niessen, 1956), **5-8.5** (Van der Werff & Huls, 1957-1974)

Calcium: **opt. 5-20 mg/l, 2.5-40 mg/l** (Leclercq, 1984), **mainly 0-140 mg/l, 0-420 mg/l** (Niessen, 1956), **0-140 mg/l** (Van der Werff & Huls, 1957-1974)

Trophic conditions: **oligo- to eutroph.** (Van der Werff & Huls, 1957-1974), **mainly dys- to oligotroph.** (Mölder & Tynni, 1967), **oligotroph.** (Bradbury, 1973), **mainly mesotroph.** (Sims, 1978; Van der Werff & Huls, 1957-1974), **mesotroph.** (Leclercq, 1984), **eutroph.** (Brockmann, 1935, 1939, 1940; Foged, 1950, 1951; Huber-Pestalozzi, 1942)

Saprobity: **saproxen.** (Hustedt, 1957), **mainly oligosaprob.** (Van der Werff & Huls, 1957-1974), **oligo- to ß-mesosaprob.** (Sladecek, 1973), **oligo- to mesosaprob.** (Cleve-Euler, 1951-1955; Van der Werff & Huls, 1957-1974), **ß-mesosaprob.** (Kalbe, 1973), **saprophil.** (Fabri & Leclercq, 1986; Leclercq, 1984)

Current: **indif.** (Foged, 1948, 1954), **limnophil.** (Schulz, 1928), **mainly running** (Sims, 1978)

Oxygen: **meso-polyoxybiont.** (Fabri & Leclercq, 1986)

Temperature: **cold** (Bradbury, 1973)

Biotopes: **neritic** (Van der Werff & Huls, 1957-1974), **littoral** (Foged, 1950, 1951; Gasse, 1987; Hustedt, 1930; Kalbe, 1973; Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974), **mainly littoral** (Germain, 1981), **periodic waters** (Simonsen, 1953), **sometimes xerotic** (Bock, 1962, 1970), **various waterbodies**

Code: **4-12-14-9-9 4-5-10-5-6 3-1-3-4-3**

AULACOSEIRA ITALICA var. TENUISSIMA (Grun.) Simonsen

Huber-Pestalozzi (1942, pl. 95, fig. 471)

Synonym: *Melosira italica* var. *tenuissima* (Grun.) Müller

Lifeform: **tychoplanktonic** (Huber-Pestalozzi, 1942)

Salinity: **fresh** (Hustedt, 1930), **oligohalob. indif.** (Schulz, 1928)

Conductivity: **<300-<3000 µS/cm** (Gasse, 1986)

pH: **opt. >8** (Cholnoky, 1968a), **6-<8.5** (Gasse, 1986)

Alkalinity: **very low to medium** (Gasse, 1986)

Saprobity: **ß-mesosaprob.** (Sladecek, 1973)

Current: **limnophil.** (Schulz, 1928)

Biotopes: **littoral** (Hustedt, 1930), **various waterbodies**

Note: Cholnoky (1968a) and Hustedt (1930) do not consider this variety separately

Code: **4-12-14-9-9 4-5-0-5-6 0-1-3-4-3**

AULACOSEIRA ITALICA var. VALIDA (Grun.) Simonsen

Hustedt (1930, fig. 109 a)

Synonym: *Melosira italica* var. *valida* Grun.

Lifeform: **planktonic** (Cleve-Euler, 1951-1955), **mainly planktonic** (Huber-Pestalozzi, 1942), **partly planktonic** (Hustedt, 1930)

Salinity: **fresh** (Mölder, 1943a), **oligohalob. indif.** (Foged, 1970, 1981)

pH: **circumneut.** (Foged, 1970), **alkaliphil.** (Foged, 1981)

Trophic conditions: **oligotroph.** (Round, 1960), **oligo- to mesotroph.** (Cleve-Euler, 1951-1955)

Temperature: **mainly cold** (Cleve-Euler, 1951-1955)

Light: **mainly clear water** (Cleve-Euler, 1951-1955)

Distribution: **northern** (Cleve-Euler, 1951-1955; Hustedt, 1930), **alpine** (Hustedt, 1930)

Biotopes: **littoral** (Mölder & Tynni, 1967), **various waterbodies**

Code: **4-12-14-9-9 4-5-5-5-0 0-1-3-4-3**

AULISCUS SCULPTUS (W. Sm.) Ralfs

Hustedt (1930, fig. 290-291); Hendey (1964, pl. 23, fig. 4)

Synonym: *Auliscus coelatus* Bailey

Lifeform: **planktonic** (König, 1959; Körber-Grohne, 1967), **mainly planktonic** (Hustedt, 1957), **rarely planktonic** (Cleve-Euler, 1951-1955; Hustedt, 1930), **tychoplanktonic** (Valente Moreira & Moreira Filho, 1982), **planktonic-benthic** (Pankow, 1976; van den Hoek et al., 1979), **benthic** (Hendey, 1951; Van der Werff, 1960), **mainly benthic, also epontic and planktonic, not sessile** (Wood, 1964), **planktonic-epontic** (König, 1983), **planktonic-epipsammic** (Vos & de Wolf, 1988), **epipsammic** (Rao & Lewin, 1976; von Stosch, 1956), **epontic** (Navarro, 1982)

Salinity: **marine** (Brockmann, 1928, 1930, 1932, 1934; Cleve-Euler, 1951-1955; Grohne, 1959; Heck & Brockmann, 1950; Hustedt, 1930; König, 1974, 1983; Körber-Grohne, 1967; Mölder & Tynni, 1968; von der Brelie, 1956; Vos & de Wolf, 1988), **polyhalob.** (Foged, 1980, 1986a; Hustedt, 1957; Ricard, 1977; Simonsen, 1962), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **mesohalob.** (Moreira Filho & Valente Moreira, 1984), **M** (Munda, 1967; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976), **S 40-30 g/l** (Navarro, 1982), **S 32-18 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 19300-19700 mg/l** (Wood, 1964), **Cl 5000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Ricard, 1977)

Temperature: **thermophil.** (Margalef, 1956), **mesothermal eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1986a; Hustedt, 1955)

Biotopes: **marine-littoral** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Giffen, 1975, 1976; Hustedt, 1930; Mölder & Tynni, 1968; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira-Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **estuarine tidal flat** (Riznyk, 1973), **tidal flat** (König, 1959), **intertidal** (Navarro, 1982; Rao & Lewin, 1976; Vos & de Wolf, 1988), **subtidal** (Navarro, 1982; von Stosch, 1956; Vos & de Wolf, 1988), **sandy substrate** (Vos & de Wolf, 1988)

Code: **3-2-2-2-3 3-1-1-1-1 1-4-2-1-2**

BIDDULPHIA ALTERNANS (Bailey) V. H.

Hustedt (1930, fig. 488); Hendey (1964, pl. 25, fig. 5)

Synonym: *Trigonium alternans* (Bailey) Mann

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Brockmann, 1935; Drebes & Elbrachter, 1976; Ehrlich, 1975; Hustedt, 1939; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **often planktonic** (Hustedt, 1930), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960; von Stosch, 1956), **planktonic-epontic** (Hustedt & Aleem, 1951; Van der Werff & Huls, 1957-1974), **benthic** (Abrantes, 1988), **epontic** (Edsbagge, 1968; Hendey, 1951; Körber-Grohne, 1967; Navarro, 1982; Tanaka et al., 1984), **epipsammic** (Rao & Lewin, 1976)

Salinity: **marine** (Bakker & De Pauw, 1974; Brockmann, 1928; Cleve-Euler, 1951-1955; Ehrlich, 1975; Hustedt, 1930; Körber-Grohne, 1967; Vos & de Wolf, 1988), **polyhalob.** (Foged, 1986a; Hustedt, 1957; Ricard, 1977), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Munda, 1967; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. mesoeuryhaline** (Edsbagge, 1968), **S 40-30 g/l** (Navarro, 1982), **S 32-5 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 10000-14000 mg/l** (Bakker & De

Pauw, 1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **stenohaline** (Ehrlich, 1975; Ricard, 1977)

Temperature: **mesothermal eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1986a; Hustedt, 1955)

Biotopes: **neritic** (Ehrlich, 1975; Hendey, 1964; Van der Werff, 1960), **marine-littoral** (Hustedt, 1930; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **mainly marine-littoral** (Brockmann, 1935), **estuarine tidal flat** (Riznyk, 1973), **tidal flat** (König, 1959), **supratidal** (Navarro, 1982), **intertidal** (Navarro, 1982; Rao & Lewin, 1976), **subtidal** (Navarro, 1982; von Stosch, 1956), **mainly on clean sand** (Riznyk, 1973)

Code: **3-2-2-2-4 3-1-1-1-1 1-4-2-1-2**

BIDDULPHIA RETICULATA Roper

Foged (1986a, pl. 2, fig. 4, pl. 4, fig. 5, pl. 5, fig. 6; as *Biddulphia reticulum* (Ehr.) Boyer); Hustedt (1930, fig. 485-486); Navarro (1981b, fig. 11-12); Navarro (1982, pl. 5, fig. 5); Ross & Sims (1971, pl. 4, fig. 5-6)

Lifeform: **epontic** (Navarro, 1982)

Salinity: **marine** (Cleve-Euler, 1951-1955; Ehrlich, 1975; Navarro, 1981b), **S 26-40 g/l** (Navarro, 1982), **equihalob.** (Ricard, 1977), **stenohaline** (Ehrlich, 1975), **euryhaline** (Ricard, 1977)

Temperature: **euthermal eurythermal** (Ricard, 1977), **mainly temperate warm** (Giffen, 1971)

Distribution: **tropical** (Giffen, 1967?), **temperate-tropical** (Navarro, 1981b)

Biotopes: **neritic** (Navarro, 1981b), **marine-littoral** (Giffen, 1971), **subtidal, intertidal** (Navarro, 1982)

Note: Ross & Sims (1971) leave the generic place of this taxon (*Odontella* Ag. or *Triceratium* Ehr.) open to question

Code: **3-2-2-2-0 3-1-1-1-1 1-0-2-1-2**

BIDDULPHIA RETICULUM (Ehr.) Boyer

Hustedt (1930, fig. 485-486); Hendey (1964, pl. 25, fig. 6)

Synonyms: *Biddulphia sculpta* (Shadb.) V. H.
Triceratium reticulum Ehr.
Trigonium reticulum (Ehr.) Simonsen

Lifeform: **planktonic** (Van der Werff, 1960), **planktonic-epontic** (Van der Werff & Huls, 1957-1974?), **epontic** (Edsbagge, 1968; Navarro, 1982), **epipsammic** (von Stosch, 1956)

Salinity: **marine** (Brockmann, 1928, 1932, 1934; Cleve-Euler, 1951-1955; Hustedt, 1930; Navarro, 1981b), **polyhalob.** (Foged, 1986a, 1987; Hustedt, 1959), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Edsbagge, 1968), **S 26-40 g/l** (Navarro, 1982), **equihalob.** (Ricard, 1977)

Temperature: **euthermal eurythermal** (Ricard, 1977)

Distribution: **tropical** (Foged, 1987), **mainly tropical-subtropical** (Hendey, 1964), **cosmopol.** (Hustedt, 1955), **temperate-tropical** (Navarro, 1981b)

Biotopes: **neritic** (Navarro, 1981b; Van der Werff, 1960), **marine-littoral** (Hendey, 1964; Hustedt, 1930; Van der Werff & Huls, 1957-1974), **subtidal** (Navarro, 1982)

Code: **3-2-2-2-3 3-1-1-1-1 1-0-2-1-2**

BIDDULPHIA ROSTRATA Hust.

Foged (1986a, pl. 3, fig. 4); Hustedt (1939, fig. 5-7)

Lifeform: **planktonic** (van den Hoek et al., 1979; Van der Werff, 1960)

Salinity: **polyhalob.** (Foged, 1986a; Van der Werff & Huls, 1957-1974), **MB** (Van der Werff & Huls, 1957-1974), **BM** (Van der Werff, 1960), **mesohalob.** (Hustedt, 1939?, 1955?), **S 32-30 g/l** (van den Hoek, 1979), **euryhaline** (Hustedt, 1939?, 1955?; Van der Werff & Huls, 1957-1974)

Distribution: **cosmopol.** (Foged, 1986a?; Hustedt, 1955?)

Biotopes: **neritic** (Van der Werff, 1960), **marine-littoral** (Van der Werff & Huls, 1957-1974)

Note: most probably this species belongs to *Odontella* Ag.

Code: **5-5-3-3-0 2-1-1-1-1 1-0-2-1-3**

BIDDULPHIA SUBAEQUA (Kütz.) Ralfs

Hustedt (1930, fig. 503-504)

Lifeform: **planktonic** (König, 1983), **tychoplanktonic** (Vos & de Wolf, 1988), **benthic** (Pankow, 1976)

Salinity: **marine to brackish** (König, 1983), **brackish** (Brockmann, 1954; Cleve-Euler, 1951-1955; Vos & de Wolf, 1988), **mainly brackish** (Hustedt, 1930?), **euhalob.** (Møller, 1950), **mesohalob.** (Brockmann, 1954; Van der Werff & Huls, 1957-1974), **BM** (Van der Werff & Huls, 1957-1974), **Cl 1000-17000 mg/l** (Vos & de Wolf, 1988), **polyhalob. meio- to meso-euryhaline** (Pankow, 1976), **strongly euryhaline** (Brockmann, 1954)

Distribution: **cosmopol.** (Hustedt, 1955?), **Meditterranean** (Van der Werff & Huls, 1957-1974)

Biotopes: **marine-littoral** (Cleve-Euler, 1951-1955; Hustedt, 1930)

Note: the generic status needs further examination

Code: **4-6-3-3-4 2-1-1-1-1 1-0-2-1-2**

BROCKMANNIELLA BROCKMANNII (Hust.) Hasle, von Stosch & Syvertsen

Hasle et al. (1983, fig. 132-155); Hustedt (1939, fig. 11-12)

Synonym: *Plagiogramma brockmannii* Hust.

Lifeform: **planktonic** (Colijn & Koeman, 1975; Hustedt, 1939, 1957), **tychoplanktonic** (Juggins, 1988; Vos & de Wolf, 1988), **planktonic-benthic** (Hasle et al., 1983; Ricard, 1987; van den Hoek et al., 1979), **epipsammic** (Vos, 1986)

Salinity: **marine** (Vos & de Wolf, 1988), **polyhalob.** (Hustedt, 1957), **euhalob.** (Hustedt, 1939; Salah, 1952; Van der Werff & Huls, 1957-1974), **M** (Van der Werff & Huls, 1957-1-74), **S 30-32 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988)

Biotopes: **marine-littoral** (Drebes & Elbrachter, 1976?; Hasle et al., 1983; Vos & de Wolf, 1988), **intertidal** (Van der Werff & Huls, 1957-1974), **lower and middle intertidal** (Riznyk, 1973), **tidal flat** (Colijn & Nienhuis, 1977; De Jonge, 1985), **estuarine sand flat** (Riznyk, 1973), **sand flat** (Hustedt, 1939), **mainly sand and silt flats** (Van der Werff & Huls, 1957-1974), **salt-marsh** (Salah, 1952), **optimum in water of 3-10 m deep** (Vos & de Wolf, 1988?)

Code: **4-2-2-2-3 4-1-1-1-1 1-4-2-1-4**

CAMPYLOSIRA CYMBELLIFORMIS (A. Schmidt) Grun.

Hustedt (1931-1959, fig. 650); Hustedt (1939, fig. 13); Salah (1955, pl. 1, fig. 17; as *C. alexandrica*)

Synonyms: *Campylosira alexandrica* Salah
Campylosira inane Giffen

Lifeform: **planktonic** (Van der Werff & Huls, 1957-1974), **tychoplanktonic** (Hasle et al., 1983?; Ricard, 1987; Vos & de Wolf, 1988), **planktonic-benthic** (van den Hoek et al., 1979), **benthic** (Hasle et al., 1983?; König, 1974; Ricard, 1987; Van der Werff, 1960), **associated to detritus** (Hasle et al., 1983)

Salinity: **marine** (Brockmann, 1928; König, 1974; Ricard, 1987; Vos & de Wolf, 1988), **polyhalob.** (Hustedt, 1957), **euhalob.** (Hustedt, 1939; Salah, 1952; Van der Werff & Huls, 1957-1974), **mesohalob.** (*alexandrica* form, Salah, 1955), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **32-5 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Hustedt, 1957)

Distribution: **more common along warmer coasts** (Hustedt, 1955; Ricard, 1987), **cosmopol.** (Hustedt, 1955; Ricard, 1987)

Biotopes: **marine-littoral** (Drebes & Elbrachter, 1976; Giffen, 1975; Hendey, 1964; Hustedt, 1931-1959; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **intertidal** (Van der Werff & Huls, 1957-1974), **tidal flat** (Colijn & Koeman, 1975; Hustedt, 1939; König, 1959), **estuarine tidal**

flat (Riznyk, 1973), **sand flat** (Hustedt, 1939), **salt-marsh** (Salah, 1952, 1955), **mainly near MHW neap tides** (*alexandrica* form, Salah, 1955), **optimum in water of 3-10 m deep** (Vos & de Wolf, 1988?)

Code: **4-2-2-2-4 2-1-1-1-1 1-4-2-1-3**

CERATAULUS RADIATUS (Roper) Ross

Cleve-Euler (1951-1955, Part 1, fig. 262); Hustedt (1930, fig. 513)

Synonym: *Cerataulus smithii* Ralfs

Lifeform: **planktonic** (Ehrlich, 1975; Hendey, 1974; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **often planktonic** (Ricard, 1987), **not rarely planktonic** (Hustedt, 1930), **rarely planktonic** (Cleve-Euler, 1951-1955), **meroplanktonic** (Moreira Filho & Valente Moreira, 1984), **planktonic-benthic** (van den Hoek et al., 1979), **benthic** (Van der Werff, 1960), **planktonic-epontic** (König, 1974), **epontic** (Navarro, 1982; von Stosch, 1956)

Salinity: **marine** (Brockmann, 1928, 1930, 1934; Cleve-Euler, 1951-1955; Ehrlich, 1975; König, 1974; Vos & de Wolf, 1988), **polyhalob.** (Foged, 1986a; Hustedt, 1957), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **S 30-40 g/l** (Navarro, 1982), **S 18-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **stenohaline** (Ehrlich, 1975), **euryhaline** (Moreira Filho & Valente Moreira, 1984)

Distribution: **southern** (Cleve-Euler, 1951-1955), **temperate-tropical** (Ricard, 1987), **cosmopol.** (Foged, 1986a?; Hustedt, 1955)

Biotopes: **marine-littoral** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **tidal flat** (Hustedt, 1939; König, 1959), **subtidal, intertidal, supratidal** (Navarro, 1982)

Code: **3-2-2-2-3 3-1-1-1-1 1-4-2-1-2**

CERATAULUS TURGIDUS (Ehr.) Ehr.

Cleve-Euler (1951-1955, Part 1, fig. 261); Hustedt (1930, fig. 512); Hendey (1964, pl. 20, fig. 4-4a); John (1983, pl. 11, fig. 6-7)

Lifeform: **planktonic** (König, 1983; van den Hoek et al., 1979), **often planktonic** (Ricard, 1987), **rarely planktonic** (Cleve-Euler, 1951-1955), **planktonic-benthic** (Pankow, 1976), **epontic** (von Stosch, 1956)

Salinity: **marine** (Brockmann, 1928, 1930, 1932, 1934; Cleve-Euler, 1951-1955; Hustedt, 1930; König, 1983; Moreira Filho & Valente Moreira, 1984), **polyhalob.** (Hustedt, 1957; Moreira Filho & Valente Moreira, 1984; Ricard, 1977; Tynni, 1980), **euhalob., M** (Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976; Simonsen, 1962), **S 32-30 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **stenohaline** (Hustedt, 1957; Moreira Filho & Valente Moreira, 1984; Ricard, 1977)

Tides: **ampotixen.** (Simonsen, 1962)

Temperature: **thermophil.** (Margalef, 1956; Van der Werff & Huls, 1957-1974), **stenothermal mesothermal** (Ricard, 1977)

Distribution: **southern** (Cleve-Euler, 1951-1955), **mainly in warmer seas** (Hustedt, 1930), **temperate-tropical** (Ricard, 1987), **cosmopol.** (Hustedt, 1955)

Biotopes: **neritic** (Moreira Filho & Valente Moreira, 1984), **marine-littoral** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964; Hustedt, 1930; Ricard, 1987; Van der Werff & Huls, 1957-1974), **tidal flat** (König, 1959), **estuarine tidal flat** (Riznyk, 1973)

Code: **3-2-2-2-3 3-1-1-1-1 1-6-2-1-2**

COSCINODISCUS APICULATUS Ehr. **var. AMBIGUUS** Grun.

Hustedt (1930, fig. 249)

Lifeform: **planktonic** (Van der Werff & Huls, 1957-1974)

Salinity: **marine** (Cleve-Euler, 1951-1955; Hustedt, 1930), **euhalob., M** (Van der Werff & Huls, 1957-1974)

Biotopes: **marine-littoral**

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-3**

COSCINODISCUS ARGUS Ehr.

Hustedt (1930, fig. 226)

Lifeform: **planktonic** (Rao & Lewin, 1976?), **mainly planktonic** (Hustedt, 1957), **planktonic-benthic** (Crosby & Wood, 1959)

Salinity: **saline** (Mölder, 1943a), **marine** (Cleve-Euler, 1951-1955; Hustedt, 1930; Mölder & Tynni, 1968), **polyhalob.** (Foged, 1986a; Hustedt, 1957), **M** (Van der Werff, 1960)

Biotopes: **neritic** (Van der Werff, 1960), **only marine-littoral** (Hustedt, 1930?)

Code: **4-2-2-2-3 3-1-1-1-1 1-0-2-1-2**

COSCINODISCUS ASTEROMPHALUS Ehr.

Hustedt (1930, fig. 250); Hendey (1964, pl. 24, fig. 2); John (1983, pl. 7, fig. 1-3)

Lifeform: **planktonic** (Brockmann, 1954; Hendey, 1964, 1974; John, 1983; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979), **tychoplanktonic** (Uherkovich, 1970), **not planktonic** (Cleve-Euler, 1951-1955)

Moreira & Moreira Filho, 1982; von der Brelie, 1956), **marine to brackish** (John, 1983), **polyhalob.** (Foged, 1986a), **eu- to mesohalob.** (Brockmann, 1954), **polyhalob. meioeuryhaline** (Pankow, 1976), **S 18-30 g/l** (van den Hoek et al., 1979), **euryhaline** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982)

Distribution: **mainly temperate and colder** (Hendey, 1970), **cosmopol.** (Foged, 1986a; Hustedt, 1955)

Biotopes: **oceanic-neritic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **marine-littoral, estuarine**

Code: **4-2-2-2-3 3-1-1-1-1 1-0-2-1-3**

COSCINODISCUS CENTRALIS Ehr.

Hustedt (1930, fig. 243); John (1983, pl. 7, fig. 4-7)

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Cleve-Euler, 1951-1955; Hendey, 1964, 1974; Hustedt, 1930; Hustedt & Aleem, 1951; John, 1983; Moreira Filho & Valente Moreira, 1984; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974), **mainly planktonic** (Hustedt, 1957), **benthic** (Wood, 1964)

Salinity: **marine** (Bakker & De Pauw, 1974; Brockmann, 1934; Cleve-Euler, 1951-1955; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; von der Brelie, 1956), **marine to brackish** (John, 1983), **polyhalob.** (Foged, 1986a; Hustedt, 1957; Ricard, 1977), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff & Huls, 1957-1974), **S 18-32 g/l** (van den Hoek et al., 1979), **Cl 10000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 12000-20000 mg/l** (Wood, 1964), **slightly euryhaline** (Van der Werff & Huls, 1957-1974), **euryhaline** (Ricard, 1977)

Temperature: **mesothermal** (Ricard, 1977)

Distribution: **Atlantic Ocean, Mediterranean** (Foged, 1986a), **cosmopol.** (Navarro, 1981a)

Biotopes: **oceanic** (Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Wood, 1964), **neritic** (Moreira Filho & Valente Moreira, 1984; Wood, 1964), **estuarine** (Wood, 1964)

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-3**

COSCINODISCUS CURVATULUS Grun.

Hustedt (1930, fig. 214)

Lifeform: **planktonic** (Berg & Hessland, 1950; Hendey, 1974; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **planktonic-epipelic** (Rao & Lewin, 1976), **hardly planktonic** (Cleve-Euler, 1951-1955)

Salinity: **saline** (Berg, 1945), **marine** (Brockmann, 1930; Cleve-Euler, 1951-1955; Ehrlich, 1975; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **polyhalob.** (Foged, 1987), **euhalob.** (Hustedt, 1939), **stenohaline** (Ehrlich, 1975)

Distribution: **arctic** (Cleve-Euler, 1951-1955), **boreal** (Hendey, 1964), **more frequent in warmer seas** (Hustedt, 1955)

Biotopes: **neritic** (Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **marine-littoral** (Giffen, 1975), **intertidal** (Rao & Lewin, 1976)

Code: **4-2-2-2-2 4-1-1-1-1 1-0-2-1-3**

COSCINODISCUS DECRESCENS Grun.

Hustedt (1930, fig. 233)

Lifeform: **planktonic** (Hustedt, 1930?; Valente Moreira & Moreira Filho, 1982)

Salinity: **marine** (Cleve-Euler, 1951-1955; Valente Moreira & Moreira Filho, 1982)

Distribution: **mainly northern** (Cleve-Euler, 1951-1955; Hustedt, 1930)

Biotopes: **marine-littoral** (Hustedt, 1930; Moreira Filho & Valente Moreira, 1984)

Code: **2-2-2-2-0 4-1-1-1-1 1-1-2-1-2**

COSCINODISCUS FIMBRIATUS Ehr.

Hustedt (1930, fig. 227)

Lifeform: **planktonic** (Hendey, 1974)

Salinity: **marine** (Hustedt, 1930)

Biotopes: **oceanic and neritic**

Code: **2-2-2-2-0 0-1-1-1-1 1-1-2-1-3**

COSCINODISCUS GRANII Gough

Hustedt (1930, fig. 237)

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964, 1974; Moreira Filho & Valente Moreira, 1984; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960)

Salinity: **marine** (Bakker & De Pauw, 1974; Cleve-Euler, 1951-1955; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1982), **polyhalob.** (Moreira Filho & Valente Moreira, 1984), **euhalob.** (Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls 1957-1974), **polyhalob. meio- to mesoeuryhaline** (Pankow, 1976), **S 32-5 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 10000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 14000-20000 mg/l** (Wood, 1964), **equihalob.** (Ricard, 1977), **stenohaline** (Ricard, 1977), **slightly euryhaline** (Van der Werff & Huls, 1957-1974)

Werff & Huls, 1957-1974), **Cl 10000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 14000-20000 mg/l** (Wood, 1964), **equihalob.** (Ricard, 1977), **stenohaline** (Ricard, 1977), **slightly euryhaline** (Van der Werff & Huls, 1957-1974)

Temperature: **warm meso-eurythermal** (Baars, 1979), **mesothermal** (Ricard, 1977), **rather thermophil.** (Van der Werff & Huls, 1957-1974)

Biotopes: **neritic** (Cleve-Euler, 1951-1955; Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira-Filho, 1982; Van der Werff, 1960; Wood, 1964), **estuarine** (Wood, 1964)

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-3**

COSCINODISCUS GRANULOSUS Grun.

Hustedt (1930, fig. 198)

Lifeform: **planktonic-benthic** (Pankow, 1976), **planktonic-epipsammic** (von Stosch, 1956)

Salinity: **marine** (Cleve-Euler, 1951-1955; Hustedt, 1930), **polyhalob.** (Hustedt, 1959), **euhalob.** (Hustedt, 1939), **polyhalob. pleioeuryhaline** (Pankow, 1976)

Distribution: **warmer regions** (Hustedt, 1955)

Biotopes: **marine-littoral** (Hustedt, 1930?), **subtidal** (von Stosch, 1956)

Code: **3-3-2-2-5 2-1-1-1-1 1-5-2-1-3**

COSCINODICUS MARGINATUS Ehr.

Hustedt (1930, fig. 223); Hendey (1964, pl. 22, fig. 2)

Lifeform: **euplanktonic** (Abrantes, 1988), **planktonic** (Hendey, 1974; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **benthic, also planktonic** (Wood, 1964)

Salinity: **saline** (Mölder, 1943b, 1962), **marine** (Brockmann, 1928; Cleve-Euler, 1944, 1951-1955; Hustedt, 1930; Mölder & Tynni, 1968; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1981), **polyhalob.** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **euhalob.** (Hustedt, 1939), **Cl 12500-19600 mg/l** (Wood, 1964), **equihalob., stenohaline** (Ricard, 1977)

Temperature: **cold** (Abrantes, 1988), **thermophil.** (Margalef, 1956), **eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Navarro, 1981a)

Biotopes: **oceanic** (Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982), **neritic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982)

Code: **2-2-2-2-0 3-1-1-1-1 1-1-2-1-2**

COSCINODICUS OBSCURUS A. Schmidt

Hustedt (1930, fig. 224)

Lifeform: **planktonic** (Brockmann, 1954; Hendey, 1957, 1974; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **mainly planktonic** (Hustedt, 1957)

Salinity: **marine** (Brockmann, 1932, 1954; Cleve-Euler, 1951-1955; Heck & Brockmann, 1950; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; von der Brelie, 1956), **polyhalob.** (Hustedt, 1957), **euhalob.** (Hustedt, 1939; Salah, 1952), **M** (Van der Werff, 1954)

Biotopes: **oceanic** (Hendey, 1957?; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982)

Code: **2-2-2-2-2 4-1-1-1-1 1-1-2-1-2**

COSCINODISCUS OCULUS-IRIDIS Ehr.

Hustedt (1930, fig. 252); Hendey (1964, pl. 24, fig. 1); John (1983, pl. 9, fig. 3-4)

Lifeform: **planktonic** (Berg & Hessland, 1949; Cleve-Euler, 1944, 1951-1955; Giffen, 1971, 1975; Hendey, 1964, 1974; Hustedt, 1930; John, 1983; Mölder, 1943a; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **planktonic-benthic** (Van der Werff & Huls, 1957-1974; von Stosch, 1956), **epontic** (Navarro, 1982)

Salinity: **saline** (Mölder, 1943a, 1962), **marine** (Brockmann, 1930, 1932, 1934; Cleve-Euler, 1944, 1951-1955; Hustedt, 1930; Mölder & Tynni, 1968; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **marine to brackish** (John, 1983), **polyhalob.** (Foged, 1986a; Moreira Filho & Valente Moreira, 1984; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982), **euhalob.** (Brockmann, 1954; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **eu- to mesohalob.** (Berg, 1952), **M** (Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976), **Sopt. about 6 g/l** (Mölder, 1943a), **S 34-35 g/l** (Navarro, 1982), **S >30 g/l** (Van der Werff & Huls, 1957-1974)

Distribution: **arctic** (Cleve-Euler, 1951-1955), **cosmopol.** (Foged, 1986a)

Biotopes: **oceanic** (Hendey, 1964, 1970?; Cleve-Euler, 1951-1955; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **neritic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira-Filho, 1982), **often near the coast** (Hendey, 1970), **subtidal** (Navarro, 1982)

Code: **4-2-2-2-5 2-1-1-1-1 1-0-2-1-2**

COSCINODISCUS PERFORATUS Ehr.

Hustedt (1930, fig. 245)

Lifeform: **planktonic** (Hendey, 1964, 1974; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984), **mainly planktonic** (Hustedt, 1957)

Salinity: **saline** (Mölder, 1943a, 1962), **marine** (Brockmann, 1928, 1932; Cleve-Euler, 1951-1955; Heck & Brockmann, 1950; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; von der Brelie, 1956), **polyhalob.** (Hustedt, 1957; Moreira Filho & Valente Moreira, 1984), **euhalob.** (Hustedt, 1939)

Biotopes: **oceanic-neritic** (Moreira Filho & Valente Moreira, 1984)

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-2**

COSCINODISCUS PERFORATUS var. CELLULOSUS Grun.

Hustedt (1930, fig. 246)

Lifeform: **planktonic** (Hustedt, 1930; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974)

Salinity: **marine** (Hustedt, 1930), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **S 32-5 g/l, mainly 30-18 g/l** (van den Hoek et al., 1979)

Biotopes: **oceanic-neritic, estuarine**

Note: Hustedt (1930) does not consider this taxon as a separate variety

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-2**

COSCINODISCUS PERFORATUS var. PAVILLARDII (Forti) Hust.

Hustedt (1930, fig. 247)

Synonym: *Coscinodiscus pavillardii* Forti

Lifeform: **planktonic** (Drebes & Elbrachter, 1976; Hendey, 1974; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974)

Salinity: **polyhalob.** (Foged, 1986a), **euhalob.** (Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **S 32-30 g/l** (van den Hoek et al., 1979)

Temperature: **warm meso-eurythermal** (Baars, 1979)

Biotopes: **marine-littoral** (Moreira Filho & Valente Moreira, 1984)

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-2**

COSCINODISCUS RADIATUS Ehr.

Hustedt (1930, fig. 225); Hendey (1964, pl. 22, fig. 7)

Lifeform: **planktonic** (Abrantes, 1988; Bakker & De Pauw, 1974; Berg & Hessland, 1949; Brockmann, 1935, 1954; Drebes & Elbrachter, 1976; Hendey, 1974; Hustedt, 1930; Hustedt & Aleem, 1951; Moreira Filho & Valente Moreira, 1984; Shaffer & Sullivan, 1988; Uherkovich,

1970?; Valente Moreira & Moreira Filho, 1982), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960; Van der Werff & Huls, 1957-1974; Wood, 1964)

Salinity: **saline** (Mölder, 1943a, 1962), **marine** (Brockmann, 1928, 1930, 1932, 1934; Cleve-Euler, 1944, 1951-1955; Conrad & Kufferath, 1954; Ehrlich, 1975; Hustedt, 1930; Mölder & Tynnni, 1968; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1982; von der Brelie, 1956; Van der Werff & Huls, 1957-1974; Van Meel, 1965), **not in brackish** (Van Meel, 1965), **marine-brackish** (Bakker & De Pauw, 1974; John, 1983), **polyhalob.** (Foged, 1986a; Hustedt, 1959; Simonsen, 1962), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **eu- to mesohalob.** (Brockmann, 1954), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. pleioeuryhaline** (Pankow, 1976), **S >4 g/l** (Mölder, 1943a), **S 32-18 g/l** (van den Hoek et al., 1979), **Cl 6000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 19000-19300 mg/l** (Wood, 1964), **stenohaline** (Ehrlich, 1975), **euryhaline** (Hustedt, 1939; Moreira Filho & Valente Moreira, 1984; Ricard, 1977), **euryhalinity variable (different strains?)** (Conrad & Kufferath, 1954)

Temperature: **warm meso-eurythermal** (Baars, 1979), **cryophil.** (Margalef, 1956), **cold** (Abrantes, 1988), **eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1986a; Hustedt, 1955; Navarro, 1981a)

Biotopes: **oceanic** (Navarro, 1981a), **neritic** (Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982; Van der Werff, 1960), **estuarine** (Van Meel, 1965), **marine-littoral**

Code: **4-3-3-3-5 2-1-1-1-1 1-0-2-1-2**

COSCINODISCUS ROTHII (Ehr.) Grun.

Hustedt (1930, fig. 211)

Lifeform: **planktonic** (Abrantes, 1988; Hendey, 1974; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979), **not planktonic** (Cleve-Euler, 1951-1955)

Salinity: **marine** (Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982), **marine to brackish** (Brockmann, 1954; Cleve-Euler, 1951-1955), **fresh** (Salden, 1978), **eu- to mesohalob.** (Hustedt, 1939), **B** (Van der Werff, 1954), **polyhalob. meioeuryhaline** (Pankow, 1976), **S 32-30 g/l** (van den Hoek et al., 1979), **euryhaline** (Hustedt, 1939; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982)

Temperature: **mainly moderately warm** (Hustedt, 1938)

Distribution: **cosmopol.** (Hustedt, 1955; Navarro, 1981a)

Biotopes: **neritic** (Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982), **marine-littoral** (Hustedt, 1938), **estuarine** (Cleve-Euler, 1951-1955)

Code: **2-8-4-3-5 2-1-1-1-1 1-1-2-1-3**

CYCLOSTEPHANOS DUBIUS (Fricke) Round

Germain (1981, pl. 10, fig. 1-12); Hustedt (1930, fig. 192)

Synonym: *Stephanodiscus dubius* (Fricke) Hust.

Lifeform: **euplanktonic** (Huber-Pestalozzi, 1942; Hustedt, 1957, 1959), **planktonic** (Behre, 1956; Cleve-Euler, 1951-1955; Foged, 1950, 1951; Germain, 1981; Hendey, 1974; Hustedt, 1930, 1946, 1950; Jørgensen, 1948; Juggins, 1988; Kalbe, 1973; Mölder & Tynni, 1968; van den Hoek et al. 1979; Van der Werff & Huls, 1957-1974), **meroplanktonic** (Abrantes, 1988)

Salinity: **brackish** (Cholnoky, 1968a; Mölder, 1943a), **weakly brackish to fresh** (Mölder & Tynni, 1968), **fresh** (Cleve-Euler, 1951-1955), **halophil.** (Budde, 1930?; Foged, 1970; Huber-Pestalozzi, 1942?; Hustedt, 1930?, 1957; Kalbe, 1973), **oligohalob. indif.** (Foged, 1948, 1949, 1954; Kolbe, 1927; Møller, 1950), **BF** (Van der Werff & Huls, 1957-1974), **oligohalob. meio- to mesoeuryhaline** (Pankow, 1976), **Sopt. 0.5-3.5 g/l, Smax. 4.5 g/l** (Mölder, 1943a), **S 5-<0.5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **Cl mainly <100 mg/l, Cl 300-1000 mg/l probably limiting after some time, tolerant to occasional increases of the salinity** (Clark, 1989), **Cl 17-5930 mg/l** (Foged, 1948), **often in water with some salt** (Foged, 1950)

Conductivity: **300-800 µS/cm** (Clark, 1989), **most <3000 µS/cm** (Fritz & Battarbee, 1988), **65-200 µS/cm** (Niessen, 1956)

pH: **neutral to alkaline** (Fabri & Leclercq, 1984), **alkaliphil. to alkalibiont.** (Kalbe, 1973), **alkalibiont.** (Foged, 1948, 1949, 1954, 1970; Hustedt, 1957; Jørgensen, 1948; Van der Werff & Huls, 1957-1974), **mainly 7.6-8.9** (Foged, 1977), **7-9** (Behre, 1956), **7.3-8.8** (Clark, 1989), **6.4-8** (Foged, 1948), **4->9** (Foged, 1977), **6.9-9** (Jørgensen, 1948; Van der Werff & Huls, 1957-1974), **5-6** (Niessen, 1956)

Alkalinity: **100-200 mg/l $CaCO_3$** (Clark, 1989)

Calcium: **0-140 mg/l** (Niessen, 1956)

Trophic conditions: **eutroph.** (Clark, 1989; Foged, 1950; Hustedt, 1954; Jørgensen, 1948; Mölder & Tynni, 1968; Van der Werff & Huls, 1957-1974)

Saprobity: **oligosaprob.** (Hustedt, 1957), **mesosaprob.** (Cleve-Euler, 1951-1955), **ß-mesosaprob.** (Sladecek, 1973), **saprophyt.** (Hustedt, 1954)

Current: **limnobiont.** (Foged, 1948, 1954)

Biotopes: **salt-marsh** (Salah, 1952; cf. note), **various, mostly permanent, waters without or with not too strong currents**

Note: records by Salah (1952) probably refer to another taxon (Clark, 1989)

Code: **2-10-12-7-9 3-4-2-5-4 0-1-2-5-3**

CYCLOTELLA ATOMUS Hust.

Germain (1981, pl. 8, fig. 22-23); Hasle (1962, pl. 3, fig. 17-19, pl. 4, fig. 20-22, pl. 5, fig. 23-28, pl. 6, fig. 32); Hustedt (1938, pl. 9, fig. 1-4)

Lifeform: **euplanktonic** (Hustedt, 1959), **planktonic** (Belcher & Swale, 1978; Germain, 1981; Hustedt, 1957; Jackson et al., 1987; Juggins, 1988; Pankow, 1976; Shaffer & Sullivan, 1988; van den Hoek et al., 1979)

Salinity: **brackish** (John, 1983), **fresh** (Belcher & Swale, 1978), **mainly weakly brackish** (Jackson et al., 1987), **mainly fresh** (Hasle, 1962?), **oligohalob.** (Hustedt, 1957), **halophil.** (Hustedt, 1957?; Pankow, 1976), **rather halophil.** (Belcher & Swale, 1978), **oligohalob. indif.** (Foged, 1981, 1986a), **most at S 0.1-4 g/l, mainly 0-8 g/l** (Jackson et al., 1987), **S up to 10 g/l** (Belcher & Swale, 1978), **S 15-30 g/l** (Hasle, 1962), **S 0-12 g/l** (Jackson et al., 1987), **common at S <0.5 g/l** (van den Hoek et al., 1979)

Conductivity: **high** (Czarnecki & Blinn, 1978)

pH: **indif.** (Hustedt, 1957), **circumneut.** (Foged, 1981)

Alkalinity: **mainly high** (Czarnecki & Blinn, 1978)

Oxygen: **mainly high** (Czarnecki & Blinn, 1978), **mesooxybiont.** (Hustedt, 1957)

Distribution: **cosmopol.** (Foged, 1986a?)

Biotopes: **mainly rivers** (Bradbury, 1973?), **travertine seeps** (Czarnecki & Blinn, 1978), **various permanent waters with not too strong currents, especially lower river reaches**

Code: **2-11-12-7-10 2-6-0-5-0 3-1-2-4-4**

CYCLOTELLA CASPIA Grun.

Hustedt (1930, fig. 177)

Lifeform: **planktonic** (Gasse et al., 1987; Shaffer & Sullivan, 1988; Wilderman, 1987), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960)

Salinity: **mainly marine to brackish** (Gasse et al., 1987), **brackish** (Cleve-Euler, 1951-1955; Hendey, 1964; Hustedt, 1930, 1955), **mesohalob.** (Foged, 1981; Gasse et al., 1987; Hustedt, 1939), **B** (Van der Werff, 1960), **Sopt. 5-30 g/l** (Gasse et al., 1987), **S mainly 24-80 g/l** (Cook & Whipple, 1982), **common at S 5-6 g/l** (Snoeijs, 1989), **S 3-34 g/l** (Gasse et al., 1987), **S (5-)15-38(-143.5) g/l** (Hasle, 1962), **S up to 30 g/l** (Hendey, 1964), **S 32-30 g/l** (van den Hoek et al., 1979), **euryhaline** (Hustedt, 1939)

Conductivity: **most 14000-20000 µS/cm** (Fritz & Battarbee, 1988)

Distribution: **Atlantic region, Europe** (Hustedt, 1955)

Biotopes: **neritic** (Van der Werff, 1960), **estuarine** (Wilderman, 1987), **salt-marsh** (Cook & Whipple, 1982), **marine-littoral and estuaries, brackish lakes**

Code: **2-8-6-4-5 2-1-1-1-1 1-1-2-1-3**

CYCLOTELLA IRIS Brun & Hérib.

Cleve-Euler (1951-1955, Part 1, fig. 67); Gasse (1986, pl. 3, fig. 10); Schimanski (1973, pl. 3, fig. 1-3)

Lifeform: **planktonic** (Pierre, 1969), **planktonic-benthic** (Gasse, 1986)

Conductivity: **1000->10000 µS/cm, abundant at 16300 µS/cm** (Gasse, 1986)

pH: **alkaline** (Gasse, 1986), **opt. >7** (Cholnoky, 1968a?), **mainly 8.6-10.9** (Gasse & Tekaia, 1983), **8.5->9.5, abundant at 9.4** (Gasse, 1986)

Alkalinity: **moderate to very high** (Gasse, 1986)

Trophic conditions: **oligotroph.** (Mölder & Tynni, 1968)

Saprobity: **tolerates rather strong pollution** (Fabri & Leclercq, 1984)

Temperature: **cold** (Mölder & Tynni, 1968)

Biotopes: **various more permanent waterbodies, mainly rivers and lakes**

Code: **4-0-11-6-0 3-4-0-5-0 0-1-2-4-3**

CYCLOTELLA KUETZINGIANA Thwaites

Germain (1981, pl. 7, fig. 10-12); Hustedt (1930, fig. 171 a)

Cyclotella krammeri Håkansson

Lifeform: **planktonic** (Cholnoky, 1970; Foged, 1951; Hustedt, 1942c, 1946, 1950, 1954; Kalbe, 1973; König, 1974; Patrick & Reimer, 1966; Salden, 1978; Sims, 1978; von der Brelie, 1956), **tychoplanktonic** (Gasse, 1987; Symoens, 1957), **less often planktonic** (Huber-Pestalozzi, 1942; Hustedt, 1930), **rarely planktonic** (Cleve-Euler, 1951-1955; Mölder & Tynni, 1968), **planktonic-benthic** (Germain, 1981; Pankow, 1976), **mainly benthic** (Gasse, 1986), **epontic** (Germain, 1936)

Salinity: **fresh** (Aleem, 1973; Brockmann, 1954; Cleve-Euler, 1951-1955; Ehrlich, 1975; Huber-Pestalozzi, 1942; Hustedt, 1930, 1942a; König, 1974; Mölder, 1943a, 1943b, 1962; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **brackish** (Giffen, 1963), **oligohalob.** (Ehrlich, 1975; Hustedt, 1957; Schulz, 1928; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **oligohalob. indif.** (Brockmann, 1954; Foged, 1948?, 1949, 1954, 1964, 1965, 1968a, 1970, 1981, 1985a; Petersen, 1943?), **F** (Van der Werff & Huls, 1957-1974), **oligohalob. meioeuryhaline** (Pankow, 1976), **mainly S <0.5 g/l** (Gasse, 1987)

Conductivity: **<300->10000 µS/cm, mainly 1000->10000 µS/cm** (Gasse, 1986), **65-200 µS/cm** (Niessen, 1956)

pH: **acid to neutral** (Sims, 1978), **indif.** (Foged, 1964, 1965, 1968a, 1970), **alkaliphil.** (Foged, 1954, 1972, 1985a), **circumneutr.** (Foged, 1981), **opt. about 8** (Cholnoky, 1968a, 1970), **6->9.5, mainly 8.5->9.5, most 9.2-10.3** (Gasse, 1986), **up to 9.3, opt. 7.4-7.6** (Salden,

1978), **4-8.9** (Foged, 1977), **6.2-7.4** (Louis & Peeters, 1967), **6-7** (Niessen, 1956), **4.1-7** (Taylor, et al. 1987)

Alkalinity: **mainly moderate to very high** (Gasse, 1986)

Calcium: **calciphil.** (Germain, 1936), **rich** (Germain, 1981)
0-140 mg/l (Niessen, 1956)

Trophic conditions: **very oligotroph.** (Bradbury, 1975), **oligotroph.** (Foged, 1951), **mainly oligotroph.** (Mölder & Tynni, 1968), **oligo- to mesotroph.** (Sims, 1978), **mainly eutroph.** (Gasse, 1986), **eutroph.** (Salden, 1978)

Saprobity: **saproxen.** (Hustedt, 1957; Kalbe, 1973), **ß-mesosaprob.** (Salden, 1978; Sladecek, 1973)

Current: **indif.** (Foged, 1948, 1954)

Biotopes: **littoral** (Gasse, 1986; Huber-Pestalozzi, 1942; Hustedt, 1930; Mölder & Tynni, 1968; Moreira Filho & Valente Moreira, 1984; Salden, 1978; Sims, 1978; Van der Werff & Huls, 1957-1974), **in various rather permanent waterbodies with not too strong currents**

Note: Data from Gasse (1986) include var. *parva* Fricke and var. *planetophora* Fricke, those from Cholnoky (1968a) var. *planetophora*. Håkansson (1990) has shown that a new name, *C. krammeri*, is necessary for the taxon commonly known as *C. kuetzingiana*

Code: **4-13-14-9-9 4-4-9-5-6 0-1-2-4-3**

CYCLOTELLA KUETZINGIANA var. PLANETOPHORA Fricke

Hustedt (1930, fig. 171 c)

Lifeform: **planktonic** (Gasse et al., 1987; Hustedt, 1954), **also planktonic** (Foged, 1950), **tychoplanktonic** (Gasse, 1987)

Salinity: **fresh** (Gasse et al., 1987), **oligohalob. indif.** (Foged, 1948?, 1949, 1954, 1964, 1968a, 1970, 1981, 1987; Gasse et al., 1987), **mainly S <0.5 g/l** (Gasse, 1987), **S 0-18 g/l, Sopt. 0-0.5 g/l** (Gasse et al., 1987)

Conductivity: **200-1000 µS/cm** (Niessen, 1956)

pH: **indif.** (Foged, 1964, 1968, 1970), **alkaliphil.** (Foged, 1954, 1972, 1987), **circumneutr.** (Foged, 1981), **opt. >8** (Gasse et al., 1987), **4-8.9** (Foged, 1977), **7-8.5** (Niessen, 1956)

Calcium: **280-420 mg/l** (Niessen, 1956)

Current: **indif.** (Foged, 1948, 1954)

Distribution: **cosmopol.** (Foged, 1987)

Biotopes: **littoral** (Foged, 1950; Gasse et al., 1987), **various rather permanent waterbodies with not too strong currents**

Code: **4-13-14-9-11 3-4-0-5-0 0-1-2-4-3**

CYCLOTELLA MENEGHINIANA Kütz.

Germain (1981, pl. 7, fig. 1-9); Hustedt (1930, fig. 174)

Lifeform: **planktonic** (Behre, 1956; Brockmann, 1940; Cholnoky, 1968a, 1970; Cleve-Euler, 1951-1955; Gasse et al., 1987; Hecky & Kilham, 1973; Hustedt, 1946, 1954, 1957, 1959; Jørgensen, 1948; Juggins, 1988; Kalbe, 1973; König, 1974; Körber-Grohne, 1967; Patrick & Reimer, 1966; Round, 1957; Shaffer & Sullivan, 1988; Vos & de Wolf, 1988), **not truly planktonic** (Hustedt, 1927b, 1930), **also planktonic** (Huber-Pestalozzi, 1942; Hustedt, 1938), **tychoplanktonic** (Gasse, 1987; Symoens, 1957), **planktonic-benthic** (Germain, 1981; Pankow, 1976; van den Hoek et al., 1979; Van der Werff, 1960), **benthic** (König, 1983), **epipelic** (Aykulu, 1982), **mainly epiphytic** (Germain, 1936, 1981)

Salinity: **marine to brackish** (Brockmann, 1928), **brackish** (Brockmann, 1941; John, 1983), **brackish to fresh** (Brockmann, 1930, 1954; Florin, 1957; Grohne, 1959; König, 1983; Mölder, 1962), **mainly weakly brackish** (Grohne, 1959; Hecky & Kilham, 1973), **opt. fresh, also brackish** (Cholnoky, 1968a), **fresh to weakly brackish** (Cholnoky, 1968b; Cleve-Euler, 1951-1955; Mölder & Tynni, 1968), **often at increased salt load** (Grimes & Rushforth, 1983), **fresh** (Brockmann, 1928, 1935; Ehrlich, 1975; Hustedt, 1942a; König, 1974; Körber--Grohne, 1967; Mölder, 1943b; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **upper brackish** (Brockmann, 1940, 1954), **eu- to oligohalob.** (Carpelan, 1978), **oligo- to mesohalob.** (Van der Werff & Huls, 1957-1974), **meshohalob. to halophil.** (Gasse et al., 1987), **oligohalob.** (Ehrlich, 1975), **rather halophil** (Cleve-Euler, 1951-1955), **halophil.** (Bradler, 1935; Brockmann, 1928, 1935, 1954; Budde, 1930, 1931; Foged, 1948, 1949, 1954, 1960, 1965, 1970, 1976, 1978, 1980, 1981, 1985a, 1985b, 1986a, 1986c, 1987; Gotoh, 1978; Huber-Pestalozzi, 1942; Hustedt, 1925, 1927b, 1930, 1935, 1938, 1939, 1942a, 1945, 1950, 1953, 1957; Kalbe, 1973; Kolbe, 1927, 1930; Kolbe & Tiegs, 1929; Møller, 1950; Moreira Filho & Valente Moreira, 1984; Petersen, 1943; Scheele, 1952, 1956; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **hardly halophil.** (Cholnoky, 1958), **oligohal. indif. to halophil.** (Berg, 1952; Schulz, 1928), **anhalophob.** (Sims, 1978), **BF** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **FB** (Van der Werff, 1954), **mesohalob. holoeuryhaline** (Carpelan, 1978), **oligohalob. holoeuryhaline** (Ziemann, 1970), **oligohalob. pleioeuryhaline** (Pankow, 1976; Simonsen, 1962), **S 3-29 g/l, mainly S 3-6 g/l** (Carpelan, 1978), **S 0-30 g/l, mainly 10-20 g/l** (Desikachary & Rao, 1972), **mainly S 5-30 g/l** (Gasse, 1987), **S 0.1-40 g/l, Sopt. 0.5-30 g/l** (Gasse et al., 1987), **opt. S 1-6 g/l** (Mölder, 1943a), **abundant at S about 9 g/l** (Brockmann, 1935), **abundant at 10 g/l** (Brockmann, 1954), **S 0-24 g/l** (Cook & Whipple, 1982), **up to S 100 g/l** (Germain, 1981), **S 32-<0.5 g/l, mainly 5-<0.5 g/l** (van den Hoek et al., 1979), **abundant up to Cl 3000 mg/l, less when higher** (Budde, 1930), **Cl 18-4000 mg/l, mainly Cl 660-4000 mg/l** (Tuchman et al., 1984), **Clmax. 20000 mg/l** (Ziemann, 1970), **abundant at Cl 1400-1700 mg/l** (Budde, 1933), **Cl** <500-6000 mg/l (Budde, 1931), **Cl 6-740 mg/l, opt. 15-20 mg/l** (Descy, 1984), **Cl 17-5930 mg/l** (Foged, 1948), **Cl 8-90 mg/l** (Scheele, 1952), **Cl 1000-17000 mg/l** (Vos & de Wolf, 1988), **tolerates temporary higher osmotic pressure** (Cholnoky, 1958), **tolerates mild osmotic pressure changes** (Cholnoky, 1970), **equihalob.** (Ricard, 1977), **euryhaline** (Germain, 1981; Maillard, 1977; Ricard, 1977)

Conductivity: **mainly high** (Brugam & Lusk, 1986), **26-12540 µS/cm** (Bradbury, 1975), **<3000-74000 µS/cm** (Fritz & Battarbee, 1988), **<300->10000 µS/cm, mainly 300->10000 µS/cm, most at >2000 µS/cm** (Gasse, 1986), **65-2000 µS/cm, mainly 200-1000 µS/cm** (Niessen, 1956), **69-2481 µS/cm, opt. 100-200 µS/cm** (Descy, 1984), **mainly higher ion concentrations** (Evenson et al., 1981; Niessen, 1956), **mainly rather high to high mineral content** (Gasse, 1986)

pH: **not in strongly acid** (Fabri & Leclercq, 1984), **alkaline** (Brugam, 1983), **alkalibiont. to alkaliphil.** (Kalbe, 1973), **alkaliphil.** (Budde, 1942; Cholnoky, 1958; Foged, 1948, 1949, 1954, 1965, 1970, 1976, 1981, 1985a, 1985b, 1986a, 1986c, 1987; Hustedt, 1957; Jørgensen, 1948; Maillard, 1977; Scheele, 1952, 1956; Sims, 1978; Van der Werff & Huls, 1957-1974), **weakly alkaliphil. to circumneutr.** (Fabri & Leclercq, 1984), **mainly >6** (Brugam & Lusk, 1986), **mainly 6-8** (Budde, 1942), **opt. >8** (Cholnoky, 1968a, 1970), **opt. about 8.5** (Cholnoky, 1968a?), **6.2-10, opt. 7.5-8** (Descy, 1984), **mainly 6.6->9** (Foged, 1977), **6->9.5, mainly 7->9.5** (Gasse, 1986), **opt. 8-9** (Gasse et al., 1987), **mainly about 8.6** (Gasse & Tekaia, 1983), **5->8.5, opt. 7-8.5** (Niessen, 1956), **7-9** (Behre, 1956), **6.4-8.3** (Foged, 1948), **6.7->9** (Jørgensen, 1948), **5.1-7.4** (Louis & Peeters, 1967), **6.9-8.1** (Scheele, 1952), **6->9** (Van der Werff & Huls, 1957-1974)

Alkalinity: **mainly at higher hardness** (Evenson et al., 1981), **low to very high, mainly low to high** (Gasse, 1986)

Calcium: **indif., 0->560 mg/l** (Niessen, 1956), **5.6-199 mg/l, opt. 80-90 mg/l** (Descy, 1984), **opt. 0-560 mg/l** (Van der Werff & Huls, 1957-1974), **mainly higher Ca concentrations** (Evenson et al., 1981)

Trophic conditions: **not in dystroph.** (Fabri & Leclercq, 1984), **oligo- to eutroph.** (Van der Werff & Huls, 1957-1974), **meso- to eutroph.** (Cleve-Euler, 1951-1955), **mainly weakly eutroph.** (Mölder & Tynni, 1968), **mainly eutroph.** (Van der Werff & Huls, 1957-1974), **eutroph.** (Brugam, 1983; Brugam & Lusk, 1986; Cholnoky, 1958, 1968b; Jørgensen, 1948; Salden, 1978; Symoens, 1957), **opt. in N rich** (Cholnoky, 1968a), **at least facultative N heterotroph.** (Cholnoky, 1968a), **facultative N heterotroph.** (Cholnoky, 1970), **N heterotroph.** (Cholnoky, 1968b), **rather N rich** (Cholnoky, 1958), **mainly higher N and P concentrations** (Evenson et al., 1981)

Saprobity: **oligo- to ß-mesosaprob.** (Van der Werff & Huls, 1957-1974), **weakly mesosaprob.** (Cholnoky, 1958), **mesosaprob.** (Cleve-Euler, 1951-1955), **ß- to α-mesosaprob.** (Kalbe, 1973; Podelleck & Pankow, 1986; Sladecek, 1973; Zelinka & Marvan, 1961), **α-mesosaprob.** (Möller & Pankow, 1981), **saprophil.** (Fabri & Leclercq, 1984, 1986), **saprophyt.** (Hustedt, 1954), **rich in organic matter** (Bradbury, 1973)

Oxygen: **meso-polyoxybiont.** (Fabri & Leclercq, 1986), **euryoxybiont.** (Hustedt, 1957), **tolerates mild deficiency** (Cholnoky, 1970)

Current: **mainly running** (Czarnecki & Blinn, 1978), **indif.** (Foged, 1948, 1954)

Temperature: **preferably higher** (Bradbury, 1973), **mesothermal** (Ricard, 1977), **eurythermal** (Gasse, 1986; Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1985a, 1985b, 1986a, 1987)

Biotopes: **eurytopic** (Gasse et al., 1987), **littoral** (Huber-Pestalozzi, 1942; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; von der Brelie, 1956), **mainly littoral** (Germain, 1981; Hustedt, 1927b, 1935, 1938), **mainly in rivers** (Bradbury, 1973?), **coastal lakes** (Simonsen, 1962), **estuarine** (Vos & de Wolf, 1988), **salt-marsh** (Cook & Whipple, 1982), **intertidal** (Grohne, 1959), **aerophil.** (Hustedt, 1942e), **moist subaerial** (Cleve-Euler, 1951-1955), **soils, mainly wet** (Brendemuhl, 1947), **intolerant of stable conditions** (Hancock, 1973), **tolerates reducing conditions** (Kolbe, 1932), **various permanent or periodic waterbodies with not too strong currents**

Code: **4-10-9-5-7 2-4-2-3-4 3-1-3-4-3**

CYCLOTELLA OCELLATA Pant.

Germain (1981, pl. 8, fig. 8-13); Hustedt (1930, fig. 173)

Lifeform: **planktonic** (Gasse, 1986; Hustedt, 1954; König, 1974; van den Hoek et al., 1979), **sometimes planktonic** (Huber-Pestalozzi, 1942), **tychoplanktonic** (Gasse, 1987)

Salinity: **fresh** (Brockmann, 1954; Ehrlich, 1975; Huber-Pestalozzi, 1942; Hustedt, 1930; König, 1974; Mölder, 1962), **oligohalob.** (Ehrlich, 1975; Van der Werff & Huls, 1957-1974), **oligohalob. indif.** (Brockmann, 1954; Foged, 1965, 1968a, 1981, 1985b, 1986a), **F** (Van der Werff & Huls, 1957-1974), **mainly S <0.5 g/l** (Gasse, 1987), **18-<0.5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979)

Conductivity: **300->10000 µS/cm, most >10000 µS/cm** (Gasse, 1986)

pH: **indif.** (Foged, 1968a), **alkaliphil.** (Foged, 1965, 1972, 1981, 1985b, 1986a), **circumneutr.** (Foged, 1985b?), **opt. 8.4-8.8** (Cholnoky, 1968a), **mainly 7.6-8.9** (Foged, 1977), **7->9.5, mainly 9.5-10.3** (Gasse, 1986), **mainly 8.6-10.9** (Gasse & Tekaia, 1983)

Alkalinity: **low to very high, most at very high** (Gasse, 1986)

Trophic conditions: **very oligotroph.** (Bradbury, 1975), **oligotroph.** (Bradbury, 1973; Earle et al., 1986)

Current: **limnobiont.** (Foged, 1948, 1954)

Temperature: **cold** (Bradbury, 1973)

Distribution: **cosmopol.** (Foged, 1985b?, 1986a)

Biotopes: **littoral** (Gasse, 1986; Hustedt 1930, 1942e; Mölder & Tynni 1968; Van der Werff & Huls, 1957-1974; von der Brelie, 1956), **peaty waters** (Germain, 1981), **various waterbodies with not too strong currents**

Note: *Cyclotella ocellata* is considered synonymous with *C. kuetzingiana* var. *planetophora* by Hartley (1986)

Code: **4-14-14-9-0 0-4-6-5-0 0-1-2-4-3**

CYCLOTELLA RADIOSA (Grun.) Lemmermann

Germain (1981, pl. 8, fig. 1-7); Håkansson (1988, fig. 12, 42-54, 58-61); Hustedt (1930, fig. 183 a-d)

Synonym: *Cyclotella comta* (Ehr.) Kütz.

Lifeform: **planktonic** (Brockmann, 1954; Conrad & Kufferath, 1954; Foged, 1948, 1951; Huber-Pestalozzi, 1942; Hustedt, 1927a, 1930, 1938, 1934, 1946, 1950, 1954, 1957, 1959; Jørgensen, 1948; Juggins, 1988; Kalbe, 1973; König, 1974; Mölder, 1943a; Mölder & Tynni, 1968; Patrick & Reimer, 1966; Scheele, 1952; Sims, 1978; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974; von der Brelie, 1956), **mainly planktonic** (Bradbury, 1975), **often planktonic** (Cleve-Euler, 1951-1955), **rarely planktonic** (Germain, 1981), **often epiphytic** (Germain, 1936)

Salinity: **fresh to brackish** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **fresh to weakly brackish** (Mölder, 1943a), **occasionaly brackish** (Hustedt, 1925), **fresh** (Aleem, 1973; Brockmann, 1954; Conrad & Kufferath, 1954; Grohne, 1959; Hustedt, 1925, 1942a; König, 1974), **oligo- to weakly mesohalob.** (Van der Werff & Huls, 1957-1974), **oligohalob.** (Conrad & Kufferath, 1954; Hustedt, 1939, 1957; Ricard, 1977; Simonsen, 1962), **oligohalob. indif. to halophil.** (Berg, 1952), **oligohalob. indif.** (Bradler, 1935; Brockmann, 1954; Foged, 1948, 1949, 1954, 1964, 1965, 1968a, 1970, 1981, 1985a, 1985b, 1986c, 1987; Kolbe, 1927; Møller, 1950; Petersen, 1943; Schulz, 1928), **strongly halophob.** (Cleve-Euler, 1951-1955), **FB** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **F** (Van der Werff, 1954), **oligohalob. meioeuryhaline** (Pankow, 1976), **mainly S 8-24 g/l** (Cook & Whipple, 1982), **S <3 g/l** (Mölder, 1943a), **S 5-<0.5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **Cl 17-159 mg/l** (Foged, 1948), **euryhaline** (Conrad & Kufferath, 1954; Ricard, 1977)

Conductivity: **26-93 µS/cm** (Bradbury, 1973), **200-1000 µS/cm** (Niessen, 1956)

pH: **indif.** (Charles, 1985; Foged, 1968a, 1970; Sims, 1978), **alkalibiont. to alkaliphil.** (Kalbe, 1973), **alkaliphil.** (Budde, 1942; Foged 1948, 1949, 1954, 1964, 1965, 1972, 1981, 1985a, 1985b, 1986c, 1987; Hustedt, 1957; Jørgensen, 1948; Mölder & Tynni, 1968?), **opt. rather high** (Cholnoky, 1968a), **mainly 7-8** (Budde, 1942), **4.3-8.5, mainly >7** (Jørgensen, 1948), **4.1-7, mainly >6** (Taylor et al., 1987), **4.3-8.5, opt. about 7** (Van der Werff & Huls, 1957-1974), **6-7.8** (Charles, 1985), **6.4-8.3** (Foged, 1948), **4->9** (Foged, 1977), **6.2-8.4** (Hustedt, 1942b), **7-8.5** (Niessen, 1956)

Calcium: **280-420 mg/l** (Niessen, 1956)

Trophic conditions: **dys- to eutroph.** (Cleve-Euler, 1951-1955; Jørgensen, 1948), **very oligotroph.** (Bradbury, 1975), **oligotroph.** (Earle et al., 1986), **oligo- to mesotroph.** (Van der Werff & Huls, 1957-1975), **oligo- to eutroph.** (Hustedt, 1927a), **eutroph.** (Foged, 1950, 1951; Symoens, 1957; Van der Werff & Huls, 1957-1974), **eurytopic** (Bradbury, 1975?; Mölder & Tynni, 1968)

Saprobity: **saproxen.** (Hustedt, 1957), **oligosaprob.** (Kalbe, 1973; Sladecek, 1973), **oligo- to mesosaprob.** (Van der Werff & Huls, 1957-1974), **ß-mesosaprob.** (Salden, 1978)

Current: **limnophil.** (Foged, 1948, 1954; Schulz, 1928)

Temperature: **eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1985a, 1985b, 1987)

Biotopes: **littoral** (Moreira Filho & Valente Moreira, 1984; Sims, 1978), **often in peaty waters** (Germain, 1981), **salt-marsh** (Cook & Whipple, 1982), **various permanent waterbodies with not too strong currents**

Note: This species appears under the name *Cyclotella comta* (Ehr.) Kütz. in most studies. Håkansson (1986, 1988) revised the taxonomy. Håkansson (1989) further comments upon the confusion between *Cyclotella bodanica* Grun., a diatom from oligotrophic waters, and the more eutraphentic *C. radiosa*.

Code: **2-12-14-9-9 3-4-10-5-6 0-1-2-4-3**

CYCLOTELLA STELLIGERA (Cl. & Grun.) V. H.

Germain (1981, pl. 8, fig. 14-18); Hustedt (1930, fig. 172)

Lifeform: **planktonic** (Cholnoky, 1958, 1970; Germain, 1981; Hustedt, 1945, 1950, 1954; John, 1983; Jørgensen 1948; Salden, 1978; Van der Werff & Huls, 1957-1974), **sometimes planktonic** (Huber-Pestalozzi, 1942), **tychoplanktonic** (Gasse, 1987), **planktonic-benthic** (Gasse, 1986), **metaphytic** (Behre, 1956), **epontic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982)

Salinity: **brackish** (John, 1983), **fresh to slightly brackish** (Germain, 1981), **fresh** (Cleve-Euler, 1951-1955; Giffen, 1970a, 1970b; Hustedt, 1930, 1942a; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **oligohalob.** (Hustedt, 1957; Van der Werff & Huls, 1957-1974), **oligohalob. indif.** (Foged, 1948?, 1954, 1968a, 1981, 1987; Gotoh, 1978), **FB** (Van der Werff & Huls, 1957-1974), **mainly S <0.5 g/l** (Gasse, 1987), **Smax. 2.5 g/l** (Mölder, 1943a)

Conductivity: **<300-456 µS/cm** (Gasse, 1986)

pH: **weakly alkaline** (Cholnoky, 1958), **acid** (Brugam, 1983), **indif.** (Charles, 1985; Foged, 1968a; Hustedt, 1957), **alkaliphil.** (Foged, 1987), **circumneutr.** (Foged, 1981), **mainly >6** (Brugam & Lusk, 1986), **opt. >8.5** (Cholnoky, 1968a?), **mainly 4-6.5** (Foged, 1977), **mainly 7-7.9** (Gasse & Tekaia, 1983), **6-7.5** (Behre, 1956), **5.1-7.8** (Charles, 1985), **6-8.5** (Gasse, 1986), **4.1-7** (Taylor et al., 1987)

Alkalinity: **soft water** (Bradbury, 1973), **low** (Gasse, 1986)

Trophic conditions: **oligo- to eutroph.** (Mölder & Tynni, 1968), **oligotroph.** (Cleve-Euler, 1951-1955), **rather eutroph.** (Cholnoky, 1958), **eutroph.** (Cholnoky, 1968a, 1970; Salden, 1978)

Saprobity: **saproxen.** (Hustedt, 1957)

Current: **limnobiont.** (Foged, 1948, 1954)

Temperature: **stenothermal mesothermal** (Gasse, 1986?)

Biotopes: **eurytopic** (Foged, 1948), **marine-littoral** (Giffen, 1976), **littoral** (Behre, 1956; Huber-Pestalozzi, 1942; Moreira Filho & Valente Moreira, 1984; Salden, 1978; Valente Moreira & Moreira Filho, 1982), **mainly shallow lakes** (Gasse, 1986), **various permanent waters with not too strong currents**

Code: **4-12-14-9-9 3-6-9-5-9 0-1-2-4-3**

CYCLOTELLA STELLIGERA var. PSEUDOSTELLIGERA (Hust.) Haworth & Hurley

Germain (1981, pl. 8, fig. 19-21); Hustedt (1939, fig. 1-2)

Synonym: *Cyclotella pseudostelligera* Hust.

Lifeform: **planktonic** (Hustedt, 1957, 1959; Juggins, 1988; Kalbe, 1973; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974), **tychoplanktonic** (Gasse, 1987), **planktonic-periphytic** (Gasse, 1986)

Salinity: **fresh** (Tynni, 1980), **mainly fresh** (Gasse, 1986), **oligohalob. indif.** (Foged, 1954, 1964, 1968a, 1981, 1986c; Hustedt, 1957), **BF-B** (Van der Werff & Huls, 1957-1974), **mainly S <0.5 g/l** (Gasse, 1987), **common at 30-<0.5 g/l** (van den Hoek et al., 1979), **tolerates some salt** (Germain, 1981), **euryhaline** (Van der Werff & Huls, 1957-1974)

Conductivity: **294-12540 µS/cm** (Bradbury, 1975), **<300->10000 µS/cm, mainly <1000 µS/cm, tolerates high mineral content** (Gasse, 1986)

pH: **indif.** (Foged, 1964, 1968a; Hustedt, 1957), **alkaliphil.** (Foged, 1954), **circumneutr.** (Foged, 1981, 1986c), **6->9.5, mainly 6-<8.5, most 7-8.5** (Gasse, 1986), **<7** (Hustedt, 1957?), **4->9** (Foged, 1977)

Alkalinity: **low to very high, mainly low to moderately high** (Gasse, 1986)

Trophic conditions: **eutroph.** (Bradbury, 1975; Haworth & Hurley, 1986)

Saprobity: **oligosaprob.** (Hustedt, 1957; Kalbe, 1973)

Oxygen: **mesooxybiont.** (Hustedt, 1957)

Current: **limnophil.** (Foged, 1954)

Light: **mainly high turbidity** (Gasse, 1986)

Biotopes: **littoral** (Kalbe, 1973), **various mainly permanent waterbodies with not too strong currents**

Note: according to Van der Werff & Huls (1957-1974) their specimens differ from the type

Code: **4-11-14-9-0 2-6-2-5-6 3-1-2-4-4**

CYCLOTELLA STRIATA (Kütz.) Grun.
CYCLOTELLA STRIATA var. AMBIGUA Grun.

Hustedt (1930, fig.176 a-b, d-e); John (1983, pl. 5, fig. 10-12)

Lifeform: **planktonic** (Brockmann, 1940; Hustedt, 1957, 1959; Jackson et al., 1987; Juggins, 1988; König, 1974; Körber-Grohne, 1967; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **planktonic-benthic** (John, 1983; Pankow, 1976; van den Hoek et al., 1979; Van der Werff, 1960), **not planktonic** (Cleve-Euler, 1951-1955), **benthic** (König, 1983), **epontic** (Ramm, 1977; Stowe, 1982)

Salinity: **saline** (Hustedt, 1942a), **marine** (Cleve-Euler 1951-1955; Conrad & Kufferath, 1954; Van Meel, 1965), **marine to brackish** (Brockmann, 1932; Hendey, 1957, 1964; Hustedt, 1930; von der Brelie, 1956), **marine to brackish, mainly weakly brackish** (Brockmann, 1928), **also in brackish** (Florin, 1957), **rarely brackish** (Cleve-Euler, 1951-1955), **brackish** (Brockmann, 1930, 1941; Giffen, 1971; Grohne, 1959; Huber-Pestalozzi, 1942; John, 1983; König, 1983; Mölder & Tynni, 1968; Valente Moreira & Moreira Filho, 1982), **weakly brackish** (Brockmann, 1939, 1954), **brackish to fresh** (König, 1974; Korber-Grohne, 1967; Van der Werff & Huls, 1957-1974), **upper brackish** (Brockmann, 1935, 1940; Grohne, 1959), **euhalob.** (Foged, 1964), **mesohalob.** (Foged, 1948, 1949, 1977, 1980, 1981, 1985a, 1986a, 1987; Gotoh, 1978; Hustedt, 1939; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **ß-mesohalob.** (Hustedt, 1957),

halophil. (Huber-Pestalozzi, 1942), **B** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **mesohalob. holoeuryhaline** (Carpelan, 1978), **mainly low salinity** (Hustedt, 1955), **S 1 g/l or more** (Bradbury, 1973), **S 0-8 g/l, mainly <2 g/l** (Jackson et al., 1987), **S 1.3-35 g/l** (Carpelan, 1978), **S 1.3-1.6 g/l** (Ramm, 1977), **S 32-<0.5 g/l, mainly 5-0.5 g/l** (van den Hoek et al., 1979), **Cl 1000-17000 mg/l** (Vos & de Wolf, 1988), **tolerates weak osmotic pressure changes** (Cholnoky, 1968a), **euryhaline** (Brockmann, 1940; Florin, 1957; Foged, 1948; Hustedt, 1939, 1942a, 1942c; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **extremely euryhaline** (Conrad & Kufferath, 1954; Van Meel, 1965)

Conductivity: **high** (Bradbury, 1973)

pH: **indif.** (Hustedt, 1957), **7.6->9** (Foged, 1977)

Oxygen: **mesooxybiont.** (Hustedt, 1957)

Distribution: **cosmopol.** (Foged, 1986a?, 1987; Hustedt, 1955)

Biotopes: **marine-littoral** (Cholnoky, 1968a; Huber-Pestalozzi, 1942; Hustedt, 1930, 1955; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **neritic** (Van der Werff & Huls, 1957-1974), **estuarine** (Vos & de Wolf, 1988), **intertidal, subtidal** (Ramm, 1977), **tidal flat** (Grohne, 1959; König, 1959), **salt-marsh** (Stowe, 1982)

Code: **4-8-7-4-7 2-4-0-5-0 3-4-3-4-3**

CYCLOTELLA STRIATA var. BIPUNCTATA Fricke

Hustedt (1930, fig. 176c)

Lifeform: **planktonic** (van den Hoek et al., 1979)

Salinity: **mesohalob.** (Foged, 1977), **S 30-<0.5 g/l, mainly S 5-0.5 g/l** (van den Hoek et al., 1979)

Biotopes: **marine-littoral and estuarine**

Code: **4-8-7-4-7 2-4-0-5-0 3-4-2-4-3**

CYCLOTELLA STRIATA var. SUBSALINA Grun.

Gotoh (1978, pl. 1, fig. 3-4); Van Heurck (1880-1885, pl. 92, fig. 11)

Lifeform: **planktonic** (Shaffer & Sullivan, 1988)

Salinity: **mesohalob.** (Gotoh, 1978)

Biotopes: **marine-littoral and estuarine**

Code: **4-8-7-4-7 2-4-0-5-0 3-4-2-4-3**

CYCLOTELLA STYLORUM Brightw.

Foged (1986a, pl. 1, fig. 4-5); Hendey (1970, pl. 6, fig. 68); Hustedt (1930, fig. 179)

Lifeform: **planktonic** (Shaffer & Sullivan, 1988), **epontic** (Navarro, 1982),

Salinity: **saline** (Berg, 1945), **marine** (Gasse et al., 1987), **polyhalob.** (Foged, 1986a; Gasse et al., 1987), **mesohalob.** (Gasse, et al. 1987?; Valente Moreira & Moreira Filho, 1982), **Sopt. 30-40 g/l** (Gasse et al., 1987), **S 0-24 g/l** (Cook & Whipple, 1982), **S 30-40 g/l** (Navarro, 1982)

pH: **opt. 8-8.5** (Gasse et al., 1987)

Distribution: **mainly tropical** (Hustedt, 1930), **tropical-subtropical** (Hendey, 1957), **warmer coasts** (Hustedt, 1938, 1955), **cosmopol.** (Foged, 1986a)

Biotopes: **marine-littoral** (Hendey, 1957; Hustedt, 1930, 1938; Valente Moreira & Moreira Filho, 1982), **salt-marsh** (Cook & Whipple, 1982), **subtidal, intertidal, supratidal** (Navarro, 1982)

Code: **2-5-3-3-0 2-1-1-1-1 1-0-2-1-3**

CYMATOSIRA BELGICA Grun.

Hustedt (1931-1959, fig. 649); Salah (1955, pl. 1, fig. 18-21, as *C. elliptica*); Navarro (1982, pl. 6, fig. 1-5)

Synonym: *Cymatosira elliptica* Salah

Lifeform: **planktonic** (Van der Werff & Huls, 1957-1974), **tychoplanktonic** (Brockmann, 1935; Hasle et al., 1983?; Juggins, 1988; Ricard, 1987; Vos & de Wolf, 1988), **planktonic-benthic** (Hustedt, 1957; van den Hoek et al., 1979; Van der Werff, 1960), **benthic** (Hasle et al., 1983?; König, 1974; Pankow, 1976; Ricard, 1987; Shaffer & Sullivan, 1988), **epipelic** (van den Hoek et al., 1979), **epipsammic** (van den Hoek et al., 1979; Vos, 1986), **epontic** (Körber-Grohne, 1967; Navarro, 1982), **associated with detritus** (Hasle et al., 1983)

Salinity: **marine** (Brockmann, 1928, 1930, 1932; Cleve-Euler, 1951-1955; Grohne, 1959; Hustedt, 1931-1959; König, 1974; Körber-Grohne, 1967; Vos & de Wolf, 1988), **polyhalob.** (Hustedt, 1957?), **euhalob.** (Hustedt, 1939; Salah, 1952; Van der Werff & Huls, 1957-1974), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Edsbagge, 1968; Pankow, 1976; Simonsen, 1962), **S 40-26 g/l** (Navarro, 1982), **S 32-0.5 g/l, mainly 32-5 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Hustedt, 1957)

Tides: **indif.** (Edsbagge, 1968; Simonsen, 1962)

Distribution: **cosmopol.** (Hustedt, 1955)

Biotopes: **marine-littoral** (Brockmann, 1935; Cleve-Euler, 1951-1955; Hendey, 1964; Hustedt, 1931-1959, 1957; Ricard, 1987; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **tidal flat** (Colijn & Dijkema, 1981; Colijn & Koeman, 1975; De Jonge, 1985; König, 1959), **mainly middle tidal flat** (Colijn & Nienhuis, 1977), **sand flat** (Hustedt, 1939), **salt-marsh** (Sullivan, 1975), **mainly lower salt-marsh** (Salah, 1955), **subtidal** (Navarro, 1982), **intertidal** (Navarro, 1982; Van der Werff & Huls, 1957-1974), **supratidal** (Navarro, 1982),

mainly clean sandy beaches (Hendey, 1964), **mainly on muddy sand and sandy mud** (Colijn & Dijkema, 1981), **mainly on muddy fine sand** (Colijn & Nienhuis, 1977), **optimum in water of 3-10 m deep** (Vos & de Wolf, 1988?)

Code: **4-2-2-2-3 3-1-1-1-1 1-4-2-1-3**

ELLERBECKIA ARENARIA Crawford

Cleve-Euler (1951-1955, Part 1, fig. 8 a-d); Germain (1981, pl. 5, fig. 1-3); Hustedt (1930, fig. 114)

Synonym: *Melosira arenaria* Moore

Lifeform: **planktonic** (Cleve-Euler, 1951-1955; van den Hoek et al., 1979), **tychoplanktonic** (Symoens, 1957), **not planktonic** (Mölder & Tynni, 1967), **benthic** (Foged, 1948, 1951)

Salinity: **brackish to fresh** (Brockmann, 1928, 1930, 1932, 1954; Florin, 1957), **fresh** (Brander, 1935; Cleve-Euler, 1951-1955; Hustedt, 1925; Mölder, 1943a), **oligohalob.** (Foged, 1978; Hustedt, 1939, 1957; Van der Werff & Huls, 1957-1974), **halophil.** (Brockmann, 1940?), **oligohalob. halophil. to indif.** (Brockmann, 1954), **oligohalob. indif.** (Berg, 1952; Foged, 1948, 1949, 1954, 1965, 1968a, 1970, 1985a, 1985b; Kolbe, 1927; Petersen, 1943; Schulz, 1928), **F** (Van der Werff & Huls, 1957-1974), **Sopt. 1-3 g/l, Smax. 4 g/l** (Mölder, 1943a), **S <0.5 g/l** (van den Hoek et al., 1979)

pH: **indif.** (Foged, 1948, 1949, 1954), **alkaliphil.** (Foged 1965, 1968a, 1970, 1978, 1985a, 1985b; Hustedt, 1957; Van der Werff & Huls, 1957-1974), **alkalibiont.-alkaliphil.** (Kalbe, 1973), **mainly 6.5-7.4** (Foged, 1968b), **7.6->9** (Foged, 1977)

Calcium: **calciphil.** (Symoens, 1957), **calcareous** (Krasske, 1932), **strongly calcareous** (Round, 1957)

Trophic conditions: **oligotroph.** (Van der Werff & Huls, 1957-1974), **mesotroph.** (Cleve-Euler, 1951-1955), **eutroph.** (Brockmann, 1939)

Saprobity: **extremely saproxen.** (Hustedt, 1957), **saproxen.** (Kalbe, 1973; Sladecek, 1973), **ß- to α-oligosaprob.** (Zelinka & Marvan, 1961)

Oxygen: **rich** (Hustedt, 1957; Van der Werff & Huls, 1957-1974)

Current: **limnobiont.** (Foged, 1954), **running** (Germain, 1981; Krasske, 1932)

Temperature: **rather cryophil., cool** (Van der Werff & Huls, 1957-1974)

Distribution: **Eurasia** (Foged, 1985a), **cosmopol.** (Foged, 1985b)

Biotopes: **eurytopic** (Brockmann, 1940), **littoral** (Cleve-Euler, 1951-1955; Foged, 1948, 1951; Hustedt, 1930; Kalbe, 1973; Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974; von der Brelie 1956), **aerophil.** (Kalbe, 1973), **wet subaerial** (Hustedt, 1930; Krasske, 1932), **moist subaerial** (Cleve-Euler, 1951-1955; Van der Werff & Huls, 1957-1974), **sandy substrate** (Brockmann, 1954; Cleve-Euler, 1951-1955; Hustedt, 1930; Van der Werff & Huls, 1957-1974), **various waterbodies and seeps, often in rather turbulent water**

Code: **4-12-14-9-9 3-4-9-5-8 2-1-3-4-2**

EUNOTOGRAMMA DUBIUM Hust.

Hustedt (1939, fig. 8-10)

Lifeform: **benthic** (König, 1974; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974), **epipsammic** (van den Hoek et al., 1979; Vos & de Wolf, 1988)

Salinity: **marine** (König, 1974), **polyhalob.** (Hustedt, 1959), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff & Huls, 1957-1974), **S 32-5 g/l, mainly 32-30 g/l** (van den Hoek et al., 1979), **Cl 5000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Hustedt, 1959)

Biotopes: **marine-littoral** (Van der Werff & Huls, 1957-1974), **tidal flat** (Colijn & Koeman, 1975; Colijn & Nienhuis, 1977; Hustedt, 1939, 1959), **subtidal, intertidal** (Vos & de Wolf, 1988), **sandy substrate** (Vos & de Wolf, 1988)

Code: **7-3-2-2-3 2-1-1-1-1 1-4-2-1-4**

EUNOTOGRAMMA MARINUM (W. Sm.) H. & M. Perag.

Foged (1986a, pl. 9, fig. 8, 10); Hustedt (1955, pl. 4, fig. 10-17); Navarro (1982, pl. 6, fig. 10)

Synonym: *Eunotogramma debile* Grun.

Lifeform: **benthic** (Van der Werff & Huls, 1957-1974), **epontic** (Hendey, 1977; Navarro, 1982)

Salinity: **polyhalob.** (Foged, 1985b, 1986a), **euhalob., M** (Van der Werff & Huls, 1957-1974), **S 40-30 g/l** (Navarro, 1982), **euryhaline** (Valente Moreira & Moreira Filho, 1982)

Distribution: **cosmopol.** (Foged, 1985b), **Atlantic Ocean, Mediterranean** (Foged, 1986a)

Biotopes: **marine-littoral** (Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **estuarine tidal flat** (Riznyk, 1973), **tidal flat** (König, 1959), **subtidal, intertidal** (Navarro, 1982)

Code: **7-2-2-2-3 2-1-1-1-1 1-0-2-1-3**

EUNOTOGRAMMA RECTUM Salah

Salah (1955, pl. 1, fig. 1-8)

Salinity: **mesohalob., euryhaline** (Hendey, 1964; Salah, 1955)

Biotopes: **sand flat** (Juggins, 1988), **salt-marsh, mainly lower part** (Salah, 1955)

Code: **7-0-0-4-0 2-1-1-1-1 1-0-2-1-4**

HEMIAULUS POLYMORPHUS Grun. **var. FRIGIDA** Grun.

Hustedt (1930, fig. 525)

Lifeform: **planktonic** (Hustedt, 1930)

Salinity: **marine** (Cleve-Euler, 1951-1955; Hustedt, 1930)

Note: probably reworked from Tertiary deposits

Code: **2-2-2-2-0 0-1-1-1-1 1-0-2-1-2**

HUTTONIELLA REICHARDTII (Grun.) Hust.

Hustedt (1930, fig. 514); Hustedt (1955, pl. 3, fig. 4-7)

Synonym: *Huttonia reichardtii* (Grun.) Grun.

Salinity: **marine** (Hustedt, 1930)

Distribution: **tropical-subtropical** (Hustedt, 1930; Hendey, 1970), **mainly S of 45° N** (Hendey, 1964), **warmer coasts** (Hustedt, 1955)

Biotopes: **marine-littoral** (Hustedt, 1930, 1955)

Code: **7-2-2-2-0 0-1-1-1-1 1-0-2-1-2**

HYALODISCUS SCOTICUS (Kütz.) Grun.

Hustedt (1930, fig. 133); John (1983, pl. 3, fig. 6-8)

Lifeform: **planktonic** (Aleem, 1973; Brockmann, 1939; Hendey, 1974; Hustedt & Aleem, 1951), **tychoplanktonic** (Vos & de Wolf, 1988), **benthic-epontic** (Simonsen, 1962), **epontic-planktonic** (König, 1974), **epontic, often planktonic** (Hustedt, 1930), **epontic** (Berg & Hessland, 1949; Brockmann, 1940; Cleve-Euler, 1951-1955; Edsbagge, 1968; König, 1983; Van der Werff & Huls, 1957-1974)

Salinity: **saline** (Mölder, 1943a, 1962), **marine** (Brockmann, 1930, 1932, 1934; Heck & Brockmann, 1950; König, 1974; von der Brelie, 1956), **marine with low salinity** (Brockmann, 1928), **marine to brackish** (Cleve-Euler, 1951-1955; Hendey, 1964; König, 1983; Mölder & Tynni, 1967), **marine to weakly brackish** (Brockmann, 1939), **brackish** (Cholnoky, 1968a; Hustedt 1930; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **lower brackish** (Brockmann, 1940; von der Brelie, 1956), **polyhalob.** (Foged, 1970, 1981, 1985b, 1985c, 1987), **euhalob.** (Hustedt, 1939; Krasske, 1938; Móller, 1950; Petersen, 1943), **eu- to mesohalob.** (Van der Werff & Huls, 1957-1974), **mesohalob.** (Brockmann, 1954; Moreira Filho & Valente Moreira, 1984; Pankow, 1976; Valente Moreira & Moreira Filho, 1982), **α-mesohalob.** (Simonsen, 1962), **MB** (Munda, 1967; Van der Werff & Huls, 1957-1974), **polyhalob. mesoeuryhaline** (Edsbagge, 1968), **Sopt. 15-30 g/l** (Mölder & Tynni, 1967), **Smin. 5 g/l** (Mölder, 1943a), **Smin. about 8 g/l** (Simonsen, 1962), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 1000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Brockmann, 1940; Hendey, 1964; Hustedt, 1939; Móller, 1950; Moreira Filho & Valente Moreira, 1984)

pH: **alkaliphil.** (Foged, 1970)

Tides: **indif.** (Edsbagge, 1968)

Distribution: **cosmopol.** (Foged, 1985b, 1987)

Biotopes: **marine-littoral** (Aleem, 1973; Cholnoky, 1968a; Hustedt, 1930; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **subtidal, intertidal** (Simonsen, 1962), **intertidal rock pools** (Aleem, 1973), **tidal flat** (König, 1959)

Code: **3-5-3-3-4 2-1-1-1-1 1-4-2-1-3**

ISTHMIA OBLIQUATA (Sm.) Ag.

Hustedt (1930, fig. 516); Hendey (1964, pl. 25, fig. 2-2a)

Synonym: *Isthmia enervis* Ehr.

Lifeform: **tychoplanktonic** (Navarro, 1981b), **epontic** (Edsbagge, 1968; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984)

Salinity: **marine** (Brockmann, 1934; Cleve-Euler, 1951-1955; Hustedt, 1930; Navarro, 1981b), **polyhalob.** (Foged, 1987), **polyhalob. oligoeuryhaline** (Edsbagge, 1968), **euryhaline** (Ricard, 1977)

Tides: **ampotixen.** (Edsbagge, 1968)

Temperature: **eurythermal oligothermal** (Ricard, 1977)

Distribution: **temperate-tropical** (Navarro, 1981b), **cosmopol.** (Foged, 1987)

Biotopes: **neritic** (Navarro, 1981b), **marine-littoral** (Cleve-Euler, 1951-1955; Hendey, 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984), **mainly rocky coasts** (Hustedt, 1930), **mainly lower sublittoral, >10-15 m deep** (Edsbagge, 1968)

Code: **3-2-2-2-2 3-1-1-1-1 1-6-2-1-2**

LEYANELLA ARENARIA Hasle, von Stosch & Syvertsen

Hasle et al. (1983, fig. 243-271, text fig. 9)

Lifeform: **tychoplanktonic-benthic** (Ricard, 1987), **interstitial between sandgrains** (Hasle et al., 1983?), **observed benthic and planktonic**

Salinity: **marine** (Hasle et al., 1983)

Biotopes: **sandy marine-littoral** (Ricard, 1987), **sand flat** (Hasle et al., 1983?)

Code: **4-2-2-2-0 0-1-1-1-1 1-0-2-1-4**

LITHODESMIUM UNDULATUM Ehr.

Hendey (1964, pl. 6, fig. 6); Hustedt (1930, fig. 461); von Stosch (1980, pl. 1, fig. 1-7, pl. 2, fig. 8-11)

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Brockmann, 1935; Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1957, 1964, 1970, 1974; Hustedt, 1930, 1939, 1955; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979; Van der Werff, 1960; Van der Werff & Huls, 1957-1974; von Stosch, 1956)

Salinity: **marine** (Cleve-Euler, 1951-1955; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **marine to brackish** (Bakker & De Pauw, 1974; John, 1983), **polyhalob.** (Foged, 1986a; Hustedt, 1959; Simonsen, 1962), **euhalob.** (Hustedt, 1939; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. oligo- to meioeuryhaline** (Pankow, 1976), **S 20-30 g/l** (Desikachary & Rao, 1972), **common at S 32-5 g/l** (van den Hoek et al., 1979), **Cl 6000-14000 mg/l** (Bakker & De Pauw, 1974), **euryhaline** (Moreira Filho & Valente Moreira, 1984)

Distribution: **cosmopol.** (Foged, 1986a; Hustedt, 1955)

Biotopes: **neritic** (Cleve-Euler, 1951-1955; Hendey, 1957, 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **marine-littoral** (Hustedt, 1930)

Note: *Lithodesmium undulatum* and *L. intricatum* Perag. are considered to be conspecific by most of the authors mentioned above. However von Stosch (1980) demonstrated that both are distinct species

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-3**

MELOSIRA LINEATA (Dillw.) Ag.

Hustedt (1930, fig. 99); Hendey (1964, pl. 1, fig. 3)

Synonym: *Melosira jurgensii* Ag.

Lifeform: **planktonic** (van den Hoek et al., 1979; Van der Werff, 1960), **planktonic-benthic** (Pankow, 1976), **benthic** (Mölder & Tynni, 1967), **epontic, sometimes planktonic** (Van der Werff & Huls, 1957-1974), **epontic** (Edsbagge, 1968; Hustedt, 1959; König, 1983)

Salinity: **marine** (Cholnoky, 1968a), **marine to brackish** (Brockmann, 1930; Mölder, 1943b), **mainly brackish, also marine** (Hustedt, 1930), **brackish** (Berg, 1945; Cleve-Euler, 1951-1955; Hustedt, 1925; König, 1983; Mölder, 1943a; Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974), **mainly in weakly brackish** (Germain, 1981), **lower brackish** (Brockmann, 1940), **polyhalob.** (Foged, 1985c), **poly- to mesohalob.** (Foged, 1987), **rather mesohalob.** (Van der Werff & Huls, 1957-1974), **mesohalob.** (Berg, 1952; Brockmann, 1954; Florin, 1957; Foged, 1970, 1986c; Hustedt, 1939, 1959; Møller, 1950; Pankow, 1976; Schulz, 1928), **ß-mesohalob.** (Edsbagge, 1968; Simonsen, 1962), **B** (Munda, 1967; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **Sopt. >5 g/l** (Mölder, 1943a), **Sopt. 3-5 g/l** (Mölder, 1943b), **Sopt. 1.5-2.5 g/l abundant at S 5-10 g/l** (Mölder & Tynni, 1967), **S 30-5 g/l** (van den Hoek et al., 1979), **tolerates osmotic pressure changes** (Cholnoky, 1968a)

pH: **alkaliphil.** (Foged, 1970)

Trophic conditions: **eutroph.** (Van der Werff & Huls, 1957-1974)

Saprobity: **rather mesosaprob.** (Van der Werff & Huls, 1957-1974), **opt. weakly mesosaprob.** (Mölder, 1943b), **ß-mesosaprob.** (Podelleck & Pankow, 1986)

Biotopes: **marine-littoral** (Hendey, 1964; Hustedt, 1930; Mölder, 1943a; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Van der Werff & Huls, 1957-1974), **marshy brackish inland waters** (Hustedt, 1930), **estuarine**

Code: **3-8-7-4-7 2-4-2-5-6 0-0-3-1-2**

MELOSIRA MONILIFORMIS (Müller) Ag.
MELOSIRA MONILIFORMIS var. HISPIDA Castrac.

Cleve-Euler (1951-1955, Part 1, fig. 21 a-c, as *M. lineata*); Hustedt (1930, fig. 98); Hendey (1964, pl. 1, fig. 2); John (1983, pl. 1, fig. 6-12)

Synonym: *Melosira borreri* Grev.

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Hustedt & Aleem, 1951; Mölder & Tynni, 1967), **tychoplanktonic** (Moreira Filho & Valente Moreira, 1984; Van Meel, 1965; Vos & de Wolf, 1988; Whiting & McIntire, 1985), **rarely planktonic** (Hustedt, 1930), **planktonic-benthic** (Pankow, 1976; van den Hoek et al., 1979), **benthic, sometimes planktonic** (Hendey, 1970), **benthic** (Shaffer & Sullivan, 1988), **mainly epontic, also planktonic** (Cleve-Euler, 1951-1955; Van der Werff & Huls, 1957-1974), **mainly epontic, also planktonic and benthic** (Wood, 1964), **epontic-benthic** (Whiting & McIntire, 1985), **mainly epontic** (Conrad & Kufferath, 1954), **epontic** (Aleem, 1950a; Edsbagge, 1968; John, 1983; König, 1983; McIntire & Overton, 1971; Rautiainen & Ravanko, 1972; Simonsen, 1962), **periphytic** (Main & McIntire, 1974)

Salinity: **marine** (Ehrlich, 1975; König 1983), **marine to brackish** (Bakker & De Pauw, 1974; Brockmann, 1932; Foged, 1951; Hustedt, 1930; John, 1983; Van der Werff & Huls, 1957-1974), **mainly brackish** (McIntire, 1978; McIntire & Overton, 1971), **brackish** (Cholnoky, 1968a; Cleve-Euler, 1951-1955; Hendey, 1964; Mölder, 1943b; Vos & de Wolf, 1988), **strongly brackish** (Brander, 1935), **upper brackish** (von der Brelie, 1956), **polyhalob.** (Foged, 1970, 1985a, 1987), **euhalob.** (Conrad & Kufferath, 1954?; Foged, 1951; Möller, 1950), **eu- to mesohalob.** (Brockmann, 1954; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **mesohalob.** (Berg, 1952; Conrad & Kufferath, 1954?; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **BM** (Munda, 1967; Van der Werff & Huls, 1957-1974), **polyhalob. pleioeuryhaline** (Edsbagge, 1968; Pankow, 1976; Simonsen, 1962), **Sopt. >7 g/l, Smin. 6 g/l** (Mölder, 1943a), **S 5-30 g/l** (Mölder & Tynni, 1967), **dominant at S 5-6 g/l** (Snoeijs, 1989), **S 18-32 g/l** (van den Hoek et al., 1979), **Cl 6000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 1000-17000 mg/l** (Vos & de Wolf, 1988), **Cl 16400-19500 mg/l** (Wood, 1964), **stenohaline** (Ehrlich, 1975) **euryhaline** (Conrad & Kufferath, 1954; McIntire, 1978; Möller, 1950; Moreira Filho & Valente Moreira, 1984; Van der Werff & Huls, 1957-1974; Van Meel, 1965)

pH: **alkaliphil.** (Foged, 1970)

Saprobity: **ß-mesosaprob.** (Podelleck & Pankow, 1986)

Temperature: **eurythermal** (Van Meel, 1965)

Distribution: **cosmopol.** (Foged, 1985a, 1987)

Biotopes: **marine-littoral** (Cholnoky, 1968a, 1968b; Conrad & Kufferath, 1954; Drebes & Elbrachter, 1976; Edsbagge, 1968; Hustedt, 1930; Hustedt & Aleem, 1951; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Van Meel, 1965), **estuarine, on rocks** (Hendey, 1964), **intertidal rock pools, mainly higher intertidal** (Cox, 1977), **intertidal** (Aleem, 1950a; Edsbagge ,1968; Whiting & McIntire, 1985), **mainly between MHWS and MLWS** (Aleem, 1950a), **estuarine tidal flat** (Riznyk, 1973), **tidal flat** (König, 1959), **rather tolerant to dessication** (McIntire, 1978)

Code: **3-6-6-4-5 2-1-1-1-1 1-4-2-1-2**

MELOSIRA NUMMULOIDES Ag.

Hustedt (1930, fig. 95); Hendey (1964, pl. 1, fig. 1)

Lifeform: **planktonic** (Aleem, 1973; van den Hoek et al., 1979), **meroplanktonic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **planktonic-benthic** (Pankow, 1976), **benthic, also planktonic** (Van der Werff, 1960), **benthic** (Louis & Peeters, 1967), **benthic-epontic** (Whiting & McIntire, 1985), **epontic, often planktonic** (Hendey, 1964), **epontic, also planktonic** (Cleve-Euler, 1951-1955; Hustedt, 1930; Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974), **epontic, also benthic and planktonic** (Wood, 1964), **mainly epontic** (Conrad & Kufferath, 1954; Van Meel, 1965), **epontic** (Edsbagge, 1968; Germain, 1981; Hustedt, 1959; John, 1983; McIntire & Overton, 1971; Moreira Filho & Valente Moreira, 1984; Navarro, 1982; Ramm, 1977; Round, 1971; Simonsen, 1962; Stowe 1982), **periphytic** (Juggins, 1988; Main & McIntire, 1974)

Salinity: **marine** (Cleve-Euler, 1944, 1951-1955; Conrad & Kufferath, 1954; Juggins, 1988; Van Meel, 1965), **marine to brackish** (Germain, 1981; Hustedt, 1930; John, 1983; Van der Werff & Huls, 1957-1974), **mainly brackish** (McIntire, 1978; McIntire & Overton, 1971), **brackish** (Brockmann, 1930; Cholnoky, 1968a; Conrad & Kufferath, 1954?; Hustedt, 1925; Mölder, 1943a, 1943b; Van Meel, 1965?), **lower brackish** (Brockmann, 1940), **polyhalob.** (Foged, 1970), **poly- to mesohalob.** (Hustedt, 1959; Van der Werff & Huls, 1957-1974), **mesohalob.** (Bradler, 1935; Foged, 1948, 1954, 1981, 1985b, 1986a, 1986c, 1987; Hustedt, 1939; Móller, 1950; Moreira Filho & Valente Moreira, 1984; Pankow, 1976; Schulz, 1928; Valente Moreira & Moreira Filho, 1982), **ß-mesohalob.** (Edsbagge, 1968?), **α-mesohalob.** (Budde, 1931; Simonsen, 1962?), **halophil.** (Symoens, 1957), **BM** (Munda, 1967; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **Sopt. >6 g/l, Smin. 1 g/l** (Mölder, 1943a), **S 4->32 g/l, mainly S 18-23 g/l** (Juggins, 1988), **mainly S about 6.1 g/l** (Koppen & Crow, 1978), **S 13-16 g/l** (Ramm, 1977), **S 10-30 g/l** (Mölder & Tynni, 1967), **S 26-40 g/l** (Navarro, 1982), **abundant at S 5-6 g/l** (Snoeijs, 1989), **S 0.5-32 g/l** (van den Hoek et al., 1979), **Cl 3000-20000 mg/l** (Budde, 1931), **Cl 19300-21100 mg/l, Clmin. <13000 mg/l** (Wood, 1964), **euryhaline** (Germain, 1981; McIntire, 1978; Van der Werff & Huls, 1957-1974), **strongly euryhaline** (Conrad & Kufferath, 1954; Van Meel, 1965; Wilderman, 1986), **not a good salinity indicator** (Wilderman, 1986)

pH: **alkaliphil.** (Foged, 1970, 1981, 1985b, 1986c), **5.1-7.4** (Louis & Peeters, 1967)

Current: **limnobiont.** (Foged, 1948)

Tides: **indif.** (Edsbagge, 1968; Simonsen, 1962)

Distribution: **cosmopol.** (Foged, 1985b, 1986a, 1987; Hustedt, 1955)

Biotopes: **neritic** (Hendey, 1964; Van der Werff, 1960), **marine-littoral** (Aleem, 1973; Drebes & Elbrachter, 1976; Giffen, 1973, 1976; Hustedt, 1930; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982), **estuarine** (Germain, 1981; Hendey, 1964; Wilderman, 1987; Wood, 1964), **saline inland waters** (Hustedt, 1930), **subtidal** (Navarro, 1982), **intertidal** (Ramm, 1977; Navarro, 1982; Whiting & McIntire, 1985; Wilderman, 1987), **intertidal rock pools** (Aleem, 1973; Cox, 1977), **tidal flats** (König, 1959), **mud flats** (Aleem, 1973), **salt-marsh** (Stowe, 1982; Sullivan, 1975, 1977), **mainly higher intertidal** (Cox, 1977; Edsbagge, 1968), **tolerates long intertidal emergence** (Main & McIntire, 1974), **rather tolerant to dessication** (McIntire, 1978)

Code: **3-6-5-4-4 2-1-1-1-1 1-4-2-1-3**

MELOSIRA VARIANS Ag.

Hustedt (1930, fig. 100)

Lifeform: **planktonic** (König, 1974), **planktonic, also epontic** (Van der Werff & Huls, 1957-1974), **tychoplanktonic** (Huber-Pestalozzi, 1942; Juggins, 1988; Moreira Filho & Valente Moreira, 1984; Symoens, 1957; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **mainly planktonic** (Cleve-Euler, 1951-1955; Hustedt, 1957), **rarely planktonic** (Hustedt, 1930), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960), **mainly benthic** (Symoens, 1957), **benthic** (Conrad & Kufferath, 1954; Mölder & Tynni, 1967), **epipelic** (Aykulu, 1982), **epontic** (Camburn & Lowe, 1978; Jørgensen, 1948), **epontic, also planktonic** (Germain, 1936), **periphytic** (Bradbury, 1973; Juggins, 1988), **epilithic** (Antoine & Benson-Evans, 1986; Camburn & Lowe, 1978)

Salinity: **brackish to fresh** (Cholnoky, 1968a; Florin, 1957; Mölder, 1943b, 1962; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **weakly brackish to fresh** (Cleve-Euler, 1951-1955; Huber-Pestalozzi, 1942; Hustedt, 1930), **fresh** (Brockmann, 1930; Conrad & Kufferath, 1954; Hustedt, 1925, 1927b, 1942a; Juggins, 1988; König, 1974; Van der Werff & Huls, 1957-1974), **weakly mesohalob. to oligohalob.** (Van der Werff & Huls, 1957-1974), **oligohalob.** (Hustedt, 1939, 1957), **halophil.** (Foged, 1981, 1985a, 1985b, 1986c), **weakly halophil.** (Cleve-Euler, 1944), **oligohalob. halophil. to indif.** (Foged, 1987), **oligohalob. indif.** (Bradler, 1935; Brockmann, 1954; Conrad & Kufferath, 1954; Foged, 1948, 1949, 1954, 1968a, 1970, 1976; Kolbe, 1927; Petersen, 1943; Scheele, 1952, 1956), **FB** (Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **oligohalob. mesoeuryhaline** (Pankow, 1976; Simonsen, 1962; Ziemann, 1970), **Sopt. 1.2-3.5 g/l, Smax. 6 g/l** (Mölder, 1943a), **Sopt. 1-2 g/l** (Mölder, 1943b), **S 0.08-23 g/l, mainly S 0.08-1.8 g/l** (Juggins, 1988), **often at S 5-10 g/l** (Mölder & Tynni, 1967), **Smax. 10 g/l** (Pankow, 1976), **S 0-0.5 g/l** (Gotoh, 1986), **S <0.5-8 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **Cl opt. 10-15 mg/l** (Descy, 1984), **Cl 4-32 mg/l, Clopt. 8-16 mg/l** (Leclercq, 1984), **Clmax. 6000 mg/l** (Ziemann, 1970), **Cl 5-441 mg/l** (Descy, 1984), **Cl 17-159 mg/l** (Foged, 1948), **Cl 1-52 mg/l** (Scheele, 1952), **Cl 0-100 mg/l** (Vos & de Wolf, 1988), **hardly tolerates any salt** (Germain, 1981), **tolerates moderately high osmotic pressure** (Cholnoky, 1968a), **euryhaline** (Foged, 1981, 1985a, 1985b)

Conductivity: **80-4736 µS/cm, opt. 100-200 µS/cm** (Descy, 1984), **50-320 µS/cm, opt. 140-320 µS/cm** (Leclercq, 1984), **65-2000 µS/cm, mainly 65-1000 µS/cm** (Niessen, 1956), **<1000 µS/cm** (Gasse, 1986), **not high** (Czarnecki & Blinn, 1978)

pH: **indif.** (Budde, 1942), **circumneut. to weakly alkaliphil.** (Fabri & Leclercq, 1984), **circumneut.-alkaliphil.** (Leclercq, 1984), **weakly alkaliphil.** (Symoens, 1957), **alkaliphil.** (Foged, 1948, 1949, 1954, 1968a, 1970, 1976, 1981, 1985a, 1985b, 1986c, 1987; Hustedt, 1957;

Jørgensen, 1948; Scheele, 1952, 1956; Van der Werff & Huls, 1957-1974), **alkaliphil. to alkalibiont.** (Kalbe, 1973), **opt. about 8.5** (Cholnoky, 1968a), **opt. 7.5-8** (Descy, 1984), **opt. 6.5-8.5** (Leclercq, 1984), **opt. 7.6-7.8** (Salden, 1978), **opt. 6.7-8.5** (Van der Werff & Huls, 1957-1974), **mainly 6-8** (Budde, 1942), **mainly 7-7.9** (Gasse & Tekaia, 1983), **7-9** (Behre, 1956), **5.9-9.1** (Descy, 1984), **6.4-8.3** (Foged, 1948), **6.6->9** (Foged, 1977), **6-<8.5** (Gasse, 1986), **6.7-9** (Jørgensen, 1948), **6.5-8.5** (Leclercq, 1984), **5.2-7.4** (Louis & Peeters, 1967), **3.5->8.5** (Niessen, 1956), **7.2-8** (Salden, 1978), **6.8-8.2** (Scheele, 1952), **5->9** (Van der Werff & Huls, 1957-1974)

Alkalinity: **low** (Gasse, 1986)

Calcium: **opt. 10-20 mg/l** (Descy, 1984), **opt. 0-140 mg/l** (Van der Werff & Huls, 1957-1974), **0->560 mg/l, mainly 0-140 mg/l** (Niessen, 1956), **5-196 mg/l** (Descy, 1984), **2.5-40 mg/l** (Leclercq, 1984)

Trophic conditions: **dys- to eutroph.** (Hustedt, 1930), **oligo- to eutroph.** (Van der Werff & Huls, 1957-1974), **meso- to eutroph.** (Leclercq, 1984), **mainly eutroph.** (Hustedt, 1930; Van der Werff & Huls, 1957-1974), **eutroph.** (Bradbury, 1973; Cholnoky, 1968a; Cleve-Euler, 1951-1955; Foged, 1950, 1951; Huber-Pestalozzi, 1942; Hustedt, 1938; Jørgensen, 1948; Kalbe, 1973; Salden, 1978), **obligate (?) N-heterotroph.** (Cholnoky, 1968a), **mainly at high P levels** (Salden, 1978)

Saprobity: **oligo- to mesosaprob.** (Van der Werff & Huls, 1957-1974), **ß-oligo- to α-mesosaprob.** (Zelinka & Marvan, 1961), **up to α-mesosaprob.** (Krammer & Lange-Bertalot, 1986; Lange-Bertalot, 1978, 1979), **rather mesosaprob.** (Van der Werff & Huls, 1957-1974), **mesosaprob.** (Scheele, 1956), **opt. weakly mesosaprob.** (Mölder, 1943b), **ß-mesosaprob when very abundant** (Hustedt, 1938), **ß-mesosaprob.** (Bradbury, 1973; Cleve-Euler, 1951-1955; Huber-Pestalozzi, 1942; Hustedt, 1930; Kalbe, 1973; Möller & Pankow, 1981; Salden, 1978; Sladecek, 1973), **saprophil.** (Fabri & Leclercq, 1986), **saprophil. to saprobiont.** (Fabri & Leclercq, 1984), **saprobiont.** (Leclercq, 1984), **often saprophyt. when very abundant** (Hustedt, 1957), **saprophyt. when very abundant** (Simonsen, 1962)

Oxygen: **high** (Germain, 1936), **tolerates moderate defficiency** (Cholnoky, 1968a), **meso- to polyoxybiont.** (Fabri & Leclercq, 1986), **euryoxybiont.** (Hustedt, 1957)

Current: **indif.** (Foged, 1948, 1954), **mainly running** (Czarnecki & Blinn, 1978; Germain, 1936)

Distribution: **cosmopol.** (Foged, 1985a, 1985b, 1987)

Biotopes: **often marine-littoral** (Mölder & Tynni, 1967), **neritic** (Van der Werff, 1960), **littoral** (Cleve-Euler, 1951-1955; Foged, 1950, 1955; Hustedt, 1930, 1938, 1957; Kalbe, 1973; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **various more permanent waterbodies**

Code: **3-12-13-8-10 2-4-2-3-4 3-1-3-4-2**

ODONTELLA AURITA (Lyngb.) Ag.

Hustedt (1930, fig. 501); Hendey (1964, pl. 24, fig. 6); John (1983, pl. 11, fig. 8-9)

Synonym: *Biddulphia aurita* (Lyngb.) Bréb. & Godey

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Ehrlich, 1975; Hendey, 1974; Hustedt & Aleem, 1951; Juggins, 1988; König, 1983), **mainly planktonic** (Hustedt, 1957), **often planktonic** (Hustedt, 1930), **sometimes planktonic** (Brockmann, 1935; Hendey, 1964; Van Meel, 1965), **tychoplanktonic** (Baars, 1986; Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Moreira Filho & Valente Moreira, 1984; Navarro, 1981b; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **planktonic-benthic** (Pankow, 1976; van den Hoek et al. 1979; Van der Werff, 1960), **planktonic-epontic** (Cleve-Euler, 1951-1955; Hendey, 1951, 1957; König, 1974), **mainly epontic** (Hendey, 1964), **epontic** (Berg & Hessland, 1949; Edsbagge, 1968; Körber-Grohne, 1967; Navarro, 1982), **planktonic-benthic-epontic** (von Stosch, 1956)

Salinity: **marine** (Bakker & De Pauw, 1974; Brockmann, 1928, 1930; Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954; Ehrlich, 1975; Grohne, 1959; Heck & Brockmann, 1950; Hustedt, 1930; König, 1974, 1983; Körber-Grohne, 1967; Navarro, 1981b; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **marine to brackish** (Brockmann, 1934), **polyhalob.** (Foged, 1970, 1978, 1981, 1985a, 1985b, 1986a, 1986b, 1987; Hustedt, 1957), **euhalob.** (Brockmann, 1954; Carpelan, 1978; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Edsbagge, 1968; Pankow, 1976; Simonsen, 1962), **Sopt. 28.5 g/l** (Cleve-Euler, 1951-1955), **Sopt. rather high** (Van Meel, 1965), **S 33-35 g/l** (Carpelan, 1978), **S 26-40 g/l** (Navarro, 1982), **S 0.5-32 g/l mainly 5-32 g/l** (van den Hoek et al., 1979), **Cl 10000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **equihalob.** (Ricard, 1977), **stenohaline** (Conrad & Kufferath, 1954; Ehrlich, 1975), **rather euryhaline** (Van Meel, 1965), **euryhaline** (Hustedt, 1939, 1957)

pH: **alkaliphil.** (Foged, 1970)

Tides: **indif.** (Edsbagge, 1968; Simonsen, 1962)

Temperature: **cold meso-eurythermal** (Baars, 1979), **cold, opt. 1 °C** (Cleve-Euler, 1951-1955), **eurythermal** (Ricard, 1977)

Distribution: **northern** (Cleve-Euler, 1951-1955), **cosmopol.** (Foged, 1985a, 1985b, 1986a, 1986b, 1987; Hustedt, 1955; Navarro, 1981b)

Biotopes: **neritic** (Cleve-Euler, 1951-1955; Ehrlich, 1975; Hendey, 1951, 1957, 1964; Navarro, 1981b; Van der Werff, 1960; Van Meel, 1965), **marine-littoral** (Brockmann, 1935; Hendey, 1964; Hustedt, 1930; Hustedt & Aleem, 1951; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Van Meel, 1965; Vos & de Wolf, 1988), **estuarine tidal flat** (Riznyk, 1973), **tidal flat** (König, 1959), **mud flat** (Aleem, 1950b), **intertidal** (Aleem, 1950a; Navarro, 1982), **lower sublittoral to supralittoral** (Edsbagge, 1968), **subtidal** (Navarro, 1982; von Stosch, 1956), **supratidal** (Navarro, 1982), **opt. in water of 3-10 m deep** (Vos & de Wolf, 1988?), **estuarine**

Note: I did not consider small forms, also known as var. *minima* Grun., separately

Code: **5-2-2-2-3 2-1-1-1-1 1-4-2-1-3**

ODONTELLA GRANULATA (Roper) Ross

Hustedt (1930, fig. 499)

Synonym: *Biddulphia granulata* Roper

Lifeform: **planktonic** (Hendey, 1964, 1974; Van der Werff & Huls, 1957-1974), **often planktonic** (Hendey, 1957), **sometimes planktonic** (Hustedt, 1930), **planktonic-benthic** (van den Hoek et al. 1979; Van der Werff, 1960), **epontic** (von Stosch, 1956)

Salinity: **marine** (Brockmann, 1928; Cleve-Euler, 1951-1955; Pankow & Mutlech, 1982), **euhalob.** (Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **S 5-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974)

Distribution: **southern** (Cleve-Euler, 1951-1955; Edsbagge, 1968)

Biotopes: **neritic** (Hendey, 1964; Van der Werff, 1960), **marine-littoral** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Edsbagge, 1968; Hendey, 1957; Hustedt, 1930; Van der Werff & Huls, 1957-1974), **estuarine**

Code: **3-2-2-2-3 3-1-1-1-1 1-0-2-1-2**

ODONTELLA MOBILIENSIS (Bailey) Grun.

Hustedt (1930, fig. 495); Hendey (1964, pl. 20, fig. 3-3a)

Synonyms: *Biddulphia mobiliensis* (Bailey) Grun.
Zygoceros mobiliensis Bailey

Lifeform: **planktonic** (Brockmann, 1935; Cleve-Euler, 1951-1955; Giffen, 1967; Hendey, 1974; Hustedt, 1930; König, 1974; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van Meel, 1965; von Stosch, 1956), **tychoplanktonic** (Navarro, 1981b), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960), **planktonic-epontic** (Wood, 1964)

Salinity: **marine** (Brockmann, 1934; Cleve-Euler, 1951-1955; Ehrlich, 1975; Hustedt, 1930; König, 1974; Moreira Filho & Valente Moreira, 1984; Navarro, 1981b; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1982), **polyhalob.** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **euhalob.** (Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976), **Sopt. 32 g/l** (Cleve-Euler, 1951-1955), **Sopt. rather high** (Van Meel, 1965), **S 15-30 g/l** (Desikachary & Rao, 1972), **S 0.5-32 g/l, mainly 18-32 g/l** (van den Hoek et al., 1979), **Cl 15000-19800 mg/l** (Wood, 1964), **stenohaline** (Ehrlich, 1975), **euryhaline** (Ricard, 1977; Van Meel, 1965)

Temperature: **opt. 7.9 °C** (Cleve-Euler, 1951-1955), **mesothermal eurythermal** (Ricard, 1977), **eurythermal** (Van Meel, 1965)

Distribution: **temperate** (Hendey, 1970), **temperate-tropical** (Navarro, 1981b), **southern** (Cleve-Euler, 1951-1955), **cosmopol.** (Hustedt, 1955)

Biotopes: **oceanic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **neritic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Navarro, 1981b; Valente Moreira & Moreira Filho, 1982; Van der Werff, 1960; Van Meel, 1965), **marine-littoral** (Drebes & Elbrachter, 1976; Hustedt, 1930), **estuarine**

Code: **3-2-2-2-3 2-1-1-1-1 1-0-2-1-3**

ODONTELLA OBTUSA Kütz.

Hustedt (1930, fig. 502)

Synonyms: *Biddulphia aurita* (Lyngb.) Bréb. & Godey var. *obtusa* (Kütz.) Hust.
Odontella aurita (Lyngb.) Ag. var. *obtusa* (Kütz.) Denys

Lifeform: **planktonic** (Hendey, 1964), **often planktonic** (Hustedt, 1930), **sometimes planktonic** (Cleve-Euler, 1951-1955), **epontic** (Edsbagge, 1968; Navarro, 1982), **epipsammic** (Rao & Lewin, 1976)

Salinity: **marine** (Cleve-Euler, 1951-1955; Hustedt, 1930; Navarro, 1981b), **polyhalob.** (Foged, 1986a, 1987), **polyhalob. meioeuryhaline** (Edsbagge, 1968?), **S 26-40 g/l** (Navarro, 1982), **equihalob.** (Ricard, 1977)

Tides: **indif.** (Edsbagge, 1968?)

Temperature: **mesothermal eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1986a, 1987; Navarro, 1981b)

Biotopes: **neritic** (Navarro, 1981b), **marine-littoral** (Cleve-Euler, 1951-1955; Giffen, 1973; Hendey, 1964; Hustedt, 1930), **subtidal, supratidal** (Navarro, 1982), **intertidal** (Rao & Lewin, 1976; Navarro, 1982), **lower sublittoral to supralittoral** (Edsbagge, 1968)

Note: Hustedt (1930) includes this taxon in *Odontella (Biddulphia) aurita*

Code: **3-2-2-2-3 2-1-1-1-1 1-4-2-1-3**

ODONTELLA REGIA (Schultze) Simonsen

Hustedt (1930, fig. 494)

Synonym: *Biddulphia regia* (Schultze) Ostenf.

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Brockmann, 1935; Drebes & Elbrachter, 1976; Hendey, 1957, 1964, 1974; Hustedt, 1930, 1956, 1957; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974)

Salinity: **marine** (Hustedt, 1956), **marine to brackish** (Bakker & De Pauw, 1974), **polyhalob.** (Hustedt, 1957; Ricard, 1977), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **S 6-14 g/l** (Bakker & De Pauw ,1974), **S 5-32 g/l, mainly 30-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **euryhaline** (Hustedt, 1939; Ricard, 1977)

Temperature: **temperate oligo-eurythermal** (Baars, 1979), **mesothermal** (Ricard, 1977)

Distribution: **cosmopol.** (Hustedt, 1955)

Biotopes: **neritic** (Hendey, 1964), **marine-littoral** (Hustedt, 1930; Hendey, 1957), **estuarine** (Hustedt, 1930)

Code: **2-2-2-2-4 2-1-1-1-1 1-1-2-1-3**

ODONTELLA RHOMBUS (Ehr.) Kütz.

Hustedt (1930, fig. 496-497); Hendey (1964, pl. 25, fig. 8)

Synonyms: *Biddulphia rhombus* (Ehr.) W. Sm.
Zygoceros rhombus Ehr.

Lifeform: **planktonic** (Hendey, 1974; Juggins, 1988; Van Meel, 1965), **sometimes planktonic** (Brockmann, 1935), **tychoplanktonic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960), **planktonic-benthic-epontic** (von Stosch, 1956), **planktonic-epontic** (König, 1974), **benthic, also planktonic** (Hustedt, 1957), **epontic** (Edsbagge, 1968; Körber-Grohne, 1967; Moreira Filho & Valente Moreira, 1984)

Salinity: **marine** (Brockmann, 1928, 1930, 1932, 1934; Cleve-Euler, 1951-1955; Ehrlich, 1975; Grohne, 1959; Heck & Brockmann, 1950; Hustedt, 1930; König, 1974; Körber-Grohne, 1967; von der Brelie, 1956), **polyhalob.** (Foged, 1986a, 1987; Hustedt, 1957; Ricard, 1977; Tynni, 1980), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **mesohalob.** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **M** (Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. mesoeuryhaline** (Edsbagge, 1968), **common at S 5-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **stenohaline** (Ehrlich, 1975), **euryhaline** (Hustedt, 1939, 1957; Moreira Filho & Valente Moreira, 1984; Ricard, 1977; Valente Moreira & Moreira Filho, 1982)

Tides: **indif.** (Edsbagge, 1968)

Temperature: **mesothermal eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1968b?, 1987; Hustedt, 1955)

Biotopes: **neritic** (Hendey, 1964; Van der Werff, 1960), **marine-littoral** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1984; Van der Werff & Huls, 1957-1974), **mainly marine-littoral** (Brockmann, 1935), **tidal flat** (Hustedt, 1939, 1957), **mud flat** (Hopkins, 1964), **subtidal** (von Stosch, 1956), **estuarine**

Code: **3-2-2-2-4 2-1-1-1-1 1-4-2-1-2**

ORTHOSIRA EPIDENDRON (Ehr.) Round, Crawford & D. Mann

Hustedt (1930, fig. 112)

Synonym: *Melosira roeseana* Rabenh.

Salinity: **fresh** (Cholnoky, 1968a; Cleve-Euler, 1951-1955), **oligohalob.** (Hustedt, 1957; Ricard, 1977), **oligohalob. indif.** (Foged, 1964, 1981, 1986a, 1987), **tolerates strong**

osmotic pressure changes (Cholnoky, 1968a), **euryhaline** (Ricard, 1977)

pH: **acidophil.** (Foged, 1972), **circumneut.** (Foged, 1981, 1986a, 1987), **alkaliphil.** (Foged, 1964; Hustedt, 1957), **opt. about 6** (Cholnoky, 1968a), **mainly 5.5-7.4** (Foged, 1968b), **7.3-8.1** (Hustedt, 1938)

Calcium: **mainly on calcareous substrate** (Bock, 1970)

Saprobity: **xenosaprob.** (Hustedt, 1957; Sladecek, 1973), **ß-oligosaprob.** (Zelinka & Marvan, 1961)

Current: **mainly running** (Hustedt, 1942a)

Temperature: **euthermal** (Ricard, 1977), **cold stenothermal** (Cleve-Euler, 1951-1955), **cold** (Mölder & Tynni, 1967)

Distribution: **cosmopol.** (Foged, 1986a, 1987)

Light: **low requirement** (Kolbe, 1932)

Biotopes: **subaerial** (Ando, 1977; Germain, 1936; Krasske, 1938, 1948), **wet subaerial** (Germain, 1981; Hustedt, 1930, 1937; StClair et al., 1981), **ephemeral waters** (Cholnoky, 1968a), **aerophil.** (Foged, 1964, 1980, 1986a, 1987; Hustedt, 1938, 1939, 1942a, 1942b, 1945, 1949, 1952a, 1957), **atmophytic** (Beger, 1927; Cleve-Euler, 1951-1955), **xerotic** (Beger, 1927; Bock, 1962, 1970; Germain, 1936; Krasske, 1932; StClair, et al. 1981), **tolerates long periods of dessication** (Germain, 1981), **various standing and running, often ephemeral waters, and moist to (very) dry habitats**

Code: **8-12-14-9-0 3-5-0-5-8 2-1-5-4-3**

PARALIA ORNATA Grun.

Cleve-Euler (1951-1955, Part 1, pl. I, fig. a, as var. *major*); Hustedt (1930, fig. 117)

Synomyms: *Melosira ornata* Grun.
Paralia ornata var. *major* A. Cl.

Salinity: **marine** (Brockmann, 1934; Cleve-Euler, 1951-1955)

Note: a reworked Tertiary species

Code: **0-2-2-2-0 0-1-1-1-1 1-0-2-0-2**

PARALIA SULCATA (Ehr.) Cl.
PARALIA SULCATA f. BISERIATA Grun.
PARALIA SULCATA f. RADIATA Grun.

Cleve-Euler (1951-1955, Part 1, fig. 33 a-h); Hustedt (1930, fig. 119); Hendey (1964, pl. 23, fig. 5); John (1983, pl. 2, fig. 6-9)

Synonyms: *Melosira sulcata* (Ehr.) Kütz.
Melosira sulcata var. *coronata* (Ehr.) Grun.
Paralia sulcata var. *coronata* (Ehr.) Andrews
Melosira sulcata f. *biseriata* Grun.
Melosira sulcata f. *radiata* Grun.

Lifeform: **planktonic** (Hustedt & Aleem, 1954; Körber-Grohne, 1967; Vos & de Wolf, 1988), **tychoplanktonic** (Brockmann, 1935; Cleve-Euler, 1951-1955; Juggins, 1988; Navarro, 1981a; Van Meel, 1965; Whiting & McIntire, 1985), **meroplanktonic** (Abrantes, 1988; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **mainly planktonic** (Hustedt, 1957), **sometimes planktonic** (Mölder & Tynni, 1967; Ricard, 1987), **rarely planktonic** (Hustedt, 1930), **planktonic-benthic** (Berg & Hessland, 1950; Cleve-Euler, 1951-1955; van den Hoek et al., 1979; Van der Werff, 1960), **benthic, often planktonic** (Hendey, 1957, 1970), **benthic, sometimes planktonic** (Hendey, 1964), **mainly benthic** (Van Meel, 1965), **benthic** (John, 1983; Ricard, 1987; von Stosch, 1956; Whiting & McIntire, 1985), **benthic-epontic, also planktonic** (Wood, 1964), **epontic-benthic-planktonic** (Edsbagge, 1968), **planktonic-epontic** (König, 1974; Pankow & Mutlech, 1982), **epontic, often planktonic** (Hendey, 1974), **epontic** (König, 1983; Navarro, 1982)

Salinity: **marine** (Brockmann, 1928, 1930, 1932, 1934; Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954; Ehrlich, 1975; Grohne, 1959; Heck & Brockmann, 1950; König, 1974, 1983; Körber-Grohne, 1967; Mölder, 1962; Navarro, 1981a; von der Brelie, 1956; Vos & de Wolf, 1988), **marine to brackish** (John, 1983), **polyhalob.** (Foged, 1970, 1972, 1977, 1978, 1980, 1985a, 1985c, 1986a, 1986b, 1987; Hustedt 1957), **euhalob.** (Conrad & Kufferath, 1954; Hustedt, 1939; Möller, 1950; Van der Werff & Huls, 1957-1974; Van Meel, 1965), **mesohalob.** (Foged, 1981; Valente Moreira & Moreira Filho, 1982), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. pleioeuryhaline** (Edsbagge, 1968; Simonsen, 1962), **polyhalob. mesoeuryhaline** (Pankow, 1976), **Sopt. 28 g/l** (Cleve-Euler, 1951-1955), **Sopt. 25-30 g/l** (Mölder & Tynni, 1967), **S as low as 15 g/l** (Desikachary & Rao, 1972), **S 26-40 g/l** (Navarro, 1982), **common at S 0.5-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **Cl 11500-19700 mg/l** (Wood 1964), **equihalob.** (Ricard, 1977), **stenohaline** (Ehrlich, 1975; Hustedt, 1939), **euryhaline** (Conrad & Kufferath, 1954; Hustedt, 1957; Möller, 1950; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Van Meel, 1965)

pH: **alkaliphil.** (Foged, 1970, 1981)

Tides: **indif.** (Edsbagge, 1968; Simonsen, 1962)

Temperature: **euthermal** (Ricard, 1977), **eurythermal** (Navarro, 1981a; Van Meel, 1965), **opt. 2.9 °C** (Cleve-Euler, 1951-1955)

Distribution: **prefers warm-temperate seas** (Ricard, 1987), **cosmopol.** (Foged, 1985a, 1986a, 1986b, 1987; Hustedt, 1955; Navarro, 1981a)

Biotopes: **neritic** (Hendey, 1964; Navarro, 1981a; Ricard, 1987; Van der Werff, 1960; Wood, 1964), **off-shore** (Brockmann, 1940), **marine-littoral** (Brockmann, 1935; Cholnoky, 1968b; Conrad & Kufferath, 1954; Drebes & Elbrachter, 1976; Giffen, 1971; Hustedt, 1930; Hustedt & Aleem, 1951; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Van Meel, 1965; Vos & de Wolf, 1988), **estuarine** (Conrad & Kufferath, 1954; Riznyk, 1973; Wood, 1964), **subtidal, supratidal** (Navarro, 1982), **intertidal** (Aleem, 1950a; Navarro, 1982), **tidal flat** (Hustedt, 1939; König, 1959; Riznyk, 1973; Whiting & McIntire, 1985), **resistant to H_2S** (von Stosch, 1956)

Note: valves of the var. *coronata* type are separation valves and do not merit a separate taxonomic status (Andrews, 1986)

Code: **5-3-2-2-4 2-1-1-1-1 1-4-2-1-2**

PLAGIOGRAMMOPSIS VANHEURCKII (Grun.) Hasle, von Stosch & Syvertsen

Hustedt (1931-1959, fig. 638); Navarro (1982, pl. 13, fig. 5-7)

Synonym: *Plagiogramma vanheurckii* Grun.

Lifeform: **planktonic** (Giffen, 1976), **tychoplanktonic** (Juggins, 1988; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **planktonic-benthic** (van den Hoek et al., 1979), **benthic** (König, 1974; Ricard, 1987; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **epontic** (Navarro, 1982), **epipsammic** (Amspoker, 1977), **periphytic** (Main & McIntire, 1974)

Salinity: **marine** (Brockmann, 1928; Ehrlich, 1975; König, 1974; Vos & de Wolf, 1988), **marine to brackish** (Main & McIntire, 1974), **polyhalob.** (Hustedt, 1957), **euhalob.** (Hustedt, 1939; Krasske, 1938; Salah, 1952; Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **S 26-40 g/l** (Navarro, 1982), **S 5-32 g/l, mainly 30-32 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **stenohaline** (Ehrlich, 1975), **euryhaline** (Hustedt, 1957)

Distribution: **cosmopol.** (Hustedt, 1955; Ricard, 1987)

Biotopes; **marine-littoral** (Giffen, 1976; Hustedt, 1931-1959; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **subtidal** (Navarro, 1982), **intertidal** (Amspoker, 1977; Navarro, 1982), **tidal flat** (Colijn & Koeman, 1975; König, 1959, Hustedt, 1939), **sand flat** (Hustedt, 1939), **salt-marsh** (Salah, 1952), **optimal in water of 3-10 m deep** (Vos & de Wolf, 1988?), **estuarine**

Code: **3-2-2-2-3 3-1-1-1-1 1-4-2-1-3**

PLEUROSIRA LAEVIS (Ehr.) Compère

Compère (1982, pl. 1, fig. 1-6, pl. 2, fig. 7-13, pl. 3, fig. 14-17, 20, pl. 7, fig. 39); Hustedt (1930, fig. 506-507); Hendey (1964, pl. 25, fig. 7); John (1983, pl. 11, fig. 10-11)

Synonyms: *Odontella laevis* Kütz.
Biddulphia laevis Ehr.

Lifeform: **planktonic** (Hendey, 1974), **tychoplanktonic, periphytic** (Czarnecki & Blinn, 1978), **planktonic-benthic** (Pankow, 1976), **benthic** (van den Hoek et al., 1979), **mainly epontic, also planktonic** (Van der Werff & Huls, 1957-1974), **epontic** (Brockmann, 1950; Hustedt, 1959; Navarro, 1982)

Salinity: **marine to fresh** (Van der Werff & Huls, 1957-1974), **marine** (Conrad & Kufferath, 1954), **marine to brackish** (Brockmann, 1928), **brackish** (Brockmann, 1950; Cholnoky, 1968a; Cleve-Euler, 1951-1955; Compère, 1982), **brackish to fresh** (Brockmann, 1954; Hustedt, 1930), **polyhalob.** (Conrad & Kufferath, 1954; Foged, 1987; Ricard, 1977), **mesoha-**

lob. (Brockmann, 1954; Hustedt, 1959; Moreira Filho & Valente Moreira, 1984), **ß-mesohalob.** (Pankow, 1976?; Simonsen, 1962?), **BF** (Van der Werff & Huls, 1957-1974), **S 35-40 g/l** (Navarro, 1982), **S 5-18 g/l** (van den Hoek et al., 1979), **S typically >9.7 g/l** (Wilderman, 1986), **prefers lowered salinity** (Hendey, 1964), **stenohaline** (Conrad & Kufferath, 1954; Ricard, 1977), **euryhaline** (Hustedt, 1959; Moreira Filho & Valente Moreira, 1984; Ricard, 1987), **strongly euryhaline** (Brockmann, 1954)

Conductivity: **777-885 µS/cm** (Czarnecki & Blinn, 1978), **higher** (Compère, 1982)

pH: **opt. 8.5 or higher** (Cholnoky, 1968a)

Alkalinity: **high** (Czarnecki & Blinn, 1978)

Trophic conditions: **oligo- to mesotroph.** (Van der Werff & Huls, 1957-1974)

Saprobity: **oligosaprob.** (Van der Werff & Huls, 1957-1974)

Current: **rheophil.?** (Czarnecki & Blinn, 1978)

Temperature: **eurythermal** (Ricard, 1977)

Distribution: **southern** (Cleve-Euler, 1951-1955), **temperate-tropical** (Ricard, 1987), **more abundant in warm-temperate and tropical waters** (Compère, 1982), **cosmopol.** (Compère, 1982; Foged, 1987)

Biotopes: **neritic** (Ricard, 1987), **marine-littoral** (Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954; Hendey, 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Ricard, 1987), **mainly estuarine** (Hustedt, 1930), **estuarine** (Cleve-Euler, 1951-1955; Compère, 1982; Hendey, 1964; Ricard, 1987), **estuarine intertidal** (Wilderman, 1987), **subtidal** (Navarro, 1982), **inland waters** (Compère, 1982; Hustedt, 1930), **seeps** (Hustedt, 1930)

Code: **3-10-7-4-7 2-2-0-0-0 1-1-3-0-3**

PLEUROSIRA LAEVIS f. POLYMORPHA Compère

Compère (1982, pl. 3, fig. 18-19, pl. 4, fig. 26, pl. 7, fig. 40); Hustedt (1930, fig. 505)

Synonym: *Biddulphia polymorpha* (Grun.) Wolle

Salinity: **marine to brackish** (Compère, 1982), **equihalob., euryhaline** (Ricard, 1977)

Temperature: **euthermal stenothermal** (Ricard, 1977)

Distribution: **southern** (Cleve-Euler, 1951-1955), **mainly warmer seas** (Hustedt, 1930), **widely distributed in temperate and warm waters** (Compère, 1982)

Biotopes: **marine-littoral** (Cleve-Euler, 1951-1955; Hustedt, 1930)

Note: perhaps only an ecological modification due to higher salinity (Compère, 1982)

Code: **3-4-3-3-3 2-1-1-1-1 1-0-2-1-3**

PODOSIRA HORMOIDES (Mont.) Kütz.

Cleve-Euler (1951-1955, Part 1, fig. 26 a); Hustedt (1930, fig. 123)

Lifeform: **planktonic** (van den Hoek et al., 1979), **epontic** (Hustedt, 1930, 1959)

Salinity: **hyperhalob.** (Ricard, 1977), **polyhalob.** (Hustedt, 1959), **polyhalob. meioeuryhaline** (Edsbagge, 1968), **S 3-32 g/l** (van den Hoek et al., 1979), **euryhaline** (Hustedt, 1959; Ricard, 1977)

Tides: **indif.** (Edsbagge, 1968)

Temperature: **eurythermal** (Ricard, 1977)

Biotopes: **marine-littoral** (Cleve-Euler, 1951-1955; Hustedt, 1930)

Code: **3-3-2-2-3 2-1-1-1-1 1-4-2-1-3**

PODOSIRA MONTAGNEI Kütz.

Hustedt (1930, fig. 122)

Lifeform: **planktonic** (Hendey, 1974), **planktonic-benthic** (Pankow, 1976), **epontic** (Edsbagge, 1968; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Navarro, 1982)

Salinity: **strongly brackish** (Giffen, 1963), **polyhalob.** (Tynni, 1980), **euhalob.** (Moreira Filho & Valente Moreira, 1984), **polyhalob. meioeuryhaline** (Edsbagge, 1968; Pankow, 1976), **prefers lower salinity** (Hendey, 1964), **S 26-40 g/l** (Navarro, 1982), **euryhaline** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982)

Tides: **indif.** (Edsbagge, 1968)

Biotopes: **marine-littoral** (Cholnoky, 1968b; Cleve-Euler, 1951-1955; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984), **mainly rocky coasts** (Hustedt & Aleem, 1951), **mainly at greater depth** (Edsbagge, 1968), **subtidal, intertidal** (Navarro, 1982)

Code: **3-4-2-2-3 2-1-1-1-1 1-4-2-1-2**

PODOSIRA STELLIGERA (Bailey) Mann

Hustedt (1930, fig. 128); Hendey (1964, pl. 22, fig. 6); John (1983, pl. 3, fig. 9-10)

Synonym: *Hyalodiscus stelliger* Bailey

Lifeform: **planktonic** (Hendey, 1974; Körber-Grohne, 1967), **mainly planktonic** (Hustedt, 1957), **tychoplanktonic** (Cleve-Euler, 1951-1955; Edsbagge, 1968; Hendey, 1964; Uherkovich, 1970; Van Meel, 1965), **rarely planktonic** (Cleve-Euler, 1951-1955; Hustedt, 1930), **planktonic-benthic** (Pankow, 1976; van den Hoek et al., 1979; Wood, 1964), **benthic** (Hendey, 1973; von Stosch, 1956), **planktonic-epontic** (John, 1983; König, 1974; Van der Werff & Huls, 1957-1974), **benthic-epontic** (Hendey, 1951), **mainly epontic** (Uherkovich, 1970), **mainly epontic, also planktonic** (Conrad & Kufferath, 1954), **epontic** (Cleve-Euler,

1951-1955; Edsbagge, 1968; Hustedt & Aleem, 1951; Moreira Filho & Valente Moreira, 1984; Navarro, 1982)

Salinity: **marine** (Brockmann, 1928, 1930, 1934; Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954; Grohne, 1959; König, 1974; Körber-Grohne, 1967; Uherkovich, 1970; von der Brelie, 1956), **marine to brackish** (John, 1983), **polyhalob.** (Foged, 1970, 1986a, 1987; Hustedt, 1957; Ricard, 1977), **euhalob.** (Conrad & Kufferath, 1954; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Munda, 1967; Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. oligoeuryhaline** (Pankow, 1976), **polyhalob. mesoeuryhaline** (Edsbagge, 1968), **tolerant oceanic** (Wood, 1964), **S 26-40 g/l** (Navarro, 1982), **S 5-32 g/l, mainly 30-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 17100-19400 mg/l** (Wood, 1964), **high salinity** (Hendey, 1951; Van Meel, 1965), **equihalob.** (Ricard, 1977), **stenohaline** (Cleve-Euler, 1951-1955), **euryhaline** (Conrad & Kufferath, 1954; Hustedt, 1939?; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982)

pH: **alkaliphil.** (Foged, 1970)

Tides: **indif.** (Edsbagge, 1968)

Temperature: **cryophil.** (Margalef, 1956), **eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1986a, 1987; Hustedt, 1955)

Biotopes: **neritic** (Van Meel, 1965; Van der Werff, 1960), **marine-littoral** (Drebes & Elbrachter, 1976; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974), **rocky coasts** (Hustedt & Aleem, 1951), **mainly lower intertidal, mainly at greater depth** (Edsbagge, 1968), **subtidal, intertidal, supratidal** (Navarro, 1982), **estuarine**

Code: **3-2-2-2-4 2-1-1-1-1 1-4-2-1-2**

PSAMMODISCUS NITIDUS (Greg.) Round & Mann

Hustedt (1930, fig; 221); Hendey (1964, pl. 23, fig. 12); John (1983, pl. 9, fig. 1-2); Round & Mann (1980, text fig. 1, pl. 1, fig. A-F, pl. 2, fig. A-F, pl. 3, fig. A)

Synonym: *Coscinodiscus nitidus* Greg.

Lifeform: **planktonic** (Hendey, 1974; Moreira Filho & Valente Moreira, 1984; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974), **meroplanktonic** (Abrantes, 1988), **planktonic-epipsammic** (von Stosch, 1956), **benthic** (Mölder & Tynni, 1968), **epipelic** (Rao & Lewin, 1976), **epontic** (Navarro, 1982), **epipsammic** (Amspoker, 1977; Rao & Lewin, 1976; Round, 1971; Round & Mann, 1980)

Salinity: **marine** (Cleve-Euler, 1951-1955; Ehrlich, 1975; Hustedt, 1930; Mölder & Tynni, 1968; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982), **polyhalob.** (Foged, 1985a, 1985b, 1986a, 1986c, 1987; Hustedt, 1959; Simonsen, 1962), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976), **S 30-40 g/l** (Navarro, 1982), **S 30-32 g/l** (van den Hoek et al., 1979), **stenohaline** (Ehrlich, 1975), **euryhaline** (Ricard, 1977)

Temperature: **cryophil.** (Margalef, 1956), **eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1985a, 1985b, 1986a, 1987; Hustedt, 1955; Navarro, 1981a)

Biotopes: **neritic** (Moreira Filho & Valente Moreira, 1984; Navarro, 1981a), **marine-littoral** (Giffen, 1975; Hendey, 1957; Hustedt, 1930; Van der Werff & Huls, 1957-1974), **sandy coasts** (Round & Mann, 1980), **clean sandy beaches** (Hendey, 1970), **subtidal** (Navarro, 1982; Round, 1971), **intertidal** (Amspoker, 1977; Navarro, 1982; Round & Mann, 1980), **estuarine tidal flat** (Riznyk, 1973)

Code: **3-2-2-2-3 2-1-1-1-1 1-0-2-1-3**

PSEUDOPODOSIRA WESTII Sheshukova-Poretzskaya

Brander (1935, text fig. 2); Cleve-Euler (1951-1955, Part 1, fig. 30); Hustedt (1930, fig. 113); Hendey (1964, pl. 1, fig. 4 & pl. 22, fig. 8)

Synonyms: *Melosira westii* W. Sm.
(?) *Melosira westii* f. *parva* Brander

Lifeform: **planktonic** (Brander, 1935; König, 1974; Körber-Grohne, 1967; Vos & de Wolf, 1988), **meroplanktonic** (Abrantes, 1988), **planktonic-benthic** (van den Hoek et al., 1979), **benthic** (Van der Werff & Huls, 1957-1974)

Salinity: **saline** (Mölder, 1943a, 1962), **marine** (Brockmann, 1928, 1930, 1932; Conrad & Kufferath, 1954; Grohne, 1959; Hendey, 1964; Hustedt, 1930; König, 1974; Körber-Grohne, 1967; Van Meel, 1965; von der Brelie, 1956; Vos & de Wolf, 1988), **marine to brackish** (Cleve-Euler, 1951-1955; Mölder & Tynni, 1967), **strongly brackish** (Brander, 1935), **polyhalob.** (Hustedt, 1957), **euhalob.** (Conrad & Kufferath, 1954; Hustedt, 1939; Van der Werff & Huls, 1957-1974; Van Meel, 1965), **mesohalob.** (Berg, 1952), **M** (Munda, 1967; Van der Werff, 1954; Van der Werff & Huls, 1957-1974), **Sopt. >6 g/l, Smin. 4 g/l** (Mölder, 1943a), **Sopt. 30 g/l** (Mölder & Tynni, 1967), **S 18-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **stenohaline** (Hustedt, 1939), **euryhaline** (Conrad & Kufferath, 1954; Van Meel, 1965)

Biotopes: **marine-littoral** (Conrad & Kufferath, 1954; Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **tidal flat** (Hustedt, 1939; König, 1959), **estuarine**

Note: in brackish conditions the dimensions are sometimes reduced (f. *parva*)

Code: **4-3-3-3-5 2-1-1-1-1 1-0-2-1-2**

RHIZOSOLENIA CALCAR-AVIS Schultze

Hustedt (1930, fig. 339)

Pseudosolenia calcar-avis (Schultze) Sundström

Lifeform: **euplanktonic** (Ehrlich, 1975), **planktonic** (Hendey, 1970, 1974; Hustedt, 1930, 1939; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979; Vos & de Wolf, 1988)

Salinity: **marine** (Brockmann, 1928, 1934; Cleve-Euler 1951-1955; Hustedt, 1930; Mölder & Tynni, 1968; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **polyhalob.** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira-Filho, 1982), **euhalob.** (Hustedt, 1939), **eu- to mesohalob.** (Brockmann, 1954), **Sopt. 27.8 g/l** (Cleve-Euler, 1951-1955), **common at S 30-32 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **Cl 18000-19900 mg/l** (Wood, 1964)

Temperature: **opt. 9 °C** (Cleve-Euler, 1951-1955)

Distribution: **less to the N** (Hustedt, 1930), **warmer seas** (Cleve-Euler, 1951-1955), **mainly tropical-subtropical** (Hendey, 1964), **temperate-tropical** (Navarro, 1981a), **tropical** (Wood, 1964)

Biotopes: **oceanic** (Cleve-Euler, 1951-1955; Hendey, 1964; Moreira-Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982), **tolerant oceanic** (Wood, 1964), **neritic** (Hendey, 1970), **marine-littoral** (Vos & de Wolf, 1988)

Code: **2-2-2-2-0 0-1-1-1-1 1-1-2-1-2**

RHIZOSOLENIA HEBETATA Bail. **f. HIEMALIS** Gran

Hendey (1964, pl. 3, fig. 6); Hustedt (1930, fig. 337)

Lifeform: **euplanktonic** (Abrantes, 1988; Cleve-Euler, 1951-1955; Uherkovich, 1970), **planktonic** (Brockmann, 1935; Drebes & Elbrachter, 1976; Hendey, 1974; Hustedt, 1930, 1939; Ricard, 1987; Vos & de Wolf, 1988)

Salinity: **marine** (Brockmann, 1928, 1930, 1932; Cleve-Euler, 1951-1955; Heck & Brockmann, 1950; Hustedt, 1930; Uherkovich, 1970; Vos & de Wolf, 1988), **euhalob.** (Carpelan, 1978; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff & Huls, 1957-1974), **Sopt. 22.9 g/l** (Cleve-Euler, 1951-1955), **S 33-35 g/l** (Carpelan, 1978), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **equihalob.** (Ricard, 1977)

Temperature: **stenothermal cold, opt. 5.1 °C** (Cleve-Euler, 1951-1955), **mesothermal eurythermal** (Ricard, 1977), **cold** (Abrantes, 1988)

Distribution: **northern** (Cleve-Euler, 1951-1955)

Biotopes: **oceanic** (Cleve-Euler, 1951-1955; Uherkovich, 1970), **marine-littoral** (Vos & de Wolf, 1988)

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-3**

RHIZOSOLENIA HEBETATA f. SEMISPINA (Hensen) Gran

Hendey (1964, pl. 3, fig. 5); Hustedt (1930, fig. 338)

Lifeform: **euplanktonic** (Cleve-Euler, 1951-1955), **planktonic** (Drebes & Elbrachter, 1976; Hendey, 1974; Ricard, 1987; Simonsen, 1962; van den Hoek et al., 1979; Van der Werff, 1960; Vos & de Wolf, 1988)

Salinity: **marine** (Cleve-Euler, 1951-1955; Navarro, 1981a; Vos & de Wolf, 1988), **polyhalob.** (Simonsen, 1962), **euhalob.** (Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976), **Sopt. 22.9 g/l** (Cleve-Euler, 1951-1955), **S 0.5-32 g/l, mainly 18-32 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **equihalob.** (Ricard, 1977)

Temperature: **stenothermal cold, opt. 5.1 °C** (Cleve-Euler, 1951-1955), **euthermal** (Ricard, 1977)

Distribution: **northern** (Cleve-Euler, 1951-1955), **cosmopol.** (Navarro, 1981a)

Biotopes: **oceanic** (Cleve-Euler, 1951-1955; Hendey, 1964; Navarro, 1981a), **marine-littoral** (Vos & de Wolf, 1988), **estuarine**

Code: **2-3-2-2-3 3-1-1-1-1 1-1-2-1-3**

RHIZOSOLENIA IMBRICATA Brightw.

Hendey (1964, pl. 3, fig. 1); Hustedt (1930, fig. 331)

Lifeform: **planktonic** (Hendey, 1970; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979; Vos & de Wolf, 1988)

Salinity: **marine** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **S 18-32 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **Cl 16500-19600 mg/l** (Wood, 1964), **euryhaline** (Ricard, 1977)

Temperature: **warm oligo-eurythermal** (Baars, 1979), **stenothermal mesothermal** (Ricard, 1977)

Distribution: **circum-tropical** (Baars, 1979), **mainly in warmer seas** (Hustedt, 1930)

Biotopes: **oceanic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Wood, 1964), **tolerant oceanic** (Wood, 1964), **neritic** (Hendey 1970; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Wood, 1964), **marine-littoral** (Vos & de Wolf, 1988), **estuarine**

Code: **2-2-2-2-0 0-1-1-1-1 1-1-2-1-3**

RHIZOSOLENIA SETIGERA Brightw.

Hendey (1964, pl. 4, fig. 1); Hustedt (1930, fig. 336)

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Drebes & Elbrachter, 1976; Hendey, 1974; Hustedt, 1939; John, 1983; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979; Vos & de Wolf, 1988), **meroplanktonic** (Cleve-Euler, 1951-1955)

Salinity: **marine** (Brockmann, 1928, 1934; Cleve-Euler, 1951-1955; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **marine to brackish** (Bakker & De Pauw, 1974; John, 1983), **polyhalob.** (Hustedt, 1959; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira

Filho, 1982), **euhalob., M** (Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976), **Sopt. 17.2 g/l** (Cleve-Euler, 1951-1955), **Smin. 7-15 g/l** (Smayda, 1958), **S 18-32 g/l** (van den Hoek et al., 1979), **Cl 6000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **Cl 12600-19800 mg/l** (Wood, 1964), **strongly euryhaline** (Cleve-Euler, 1951-1955), **euryhaline** (Hustedt, 1930)

Temperature: **cold oligo-eurythermal** (Baars, 1979), **eurythermal mesothermal** (Ricard, 1977), **eurythermal** (Hustedt, 1930), **mainly colder** (Hendey, 1964), **opt. 3.5 °C** (Cleve-Euler, 1951-1955)

Distribution: **mainly northern** (Hustedt, 1930), **temperate-tropical** (Navarro, 1981a)

Biotopes: **oceanic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Wood, 1964), **neritic** (Cleve-Euler, 1951-1955; Hendey 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982; Wood, 1964), **marine-littoral** (Vos & de Wolf, 1988), **estuarine** (Navarro, 1981a; Wood, 1964)

Code: **2-2-2-2-3 2-1-1-1-1 1-1-2-1-3**

RHIZOSOLENIA SHRUBSOLEI Cl.

Hendey (1964, pl. 3, fig. 2); Hustedt (1930, fig. 332)

Synonym: *Rhizosolenia imbricata* var. *shrubsolei* (Cl.) Schröder

Lifeform: **planktonic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hustedt, 1939; Uherkovich, 1970; van den Hoek et al., 1979; Van der Werff, 1960; Van der Werff & Huls, 1957-1974)

Salinity: **marine** (Cleve-Euler, 1951-1955; Hustedt, 1930, 1959; Navarro, 1981a; Uherkovich, 1970), **polyhalob.** (Hustedt, 1959), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **Sopt. 29.9 g/l** (Cleve-Euler, 1951-1955), **S 5-32 g/l, mainly 5-30 g/l** (van den Hoek et al., 1979), **Cl 16500-19600 mg/l** (Wood, 1964), **stenohaline** (Cleve-Euler, 1951-1955)

Temperature: **stenothermal mesothermal** (Ricard, 1977) **opt. about 14.1 °C** (Cleve-Euler, 1951-1955)

Distribution: **cosmopol. in temperate-tropical waters** (Navarro, 1981a), **intertropical, temperate** (Ricard, 1977)

Biotopes: **oceanic** (Cleve-Euler, 1951-1955), **rather oceanic** (Uherkovich, 1970), **oceanic-neritic** (Wood, 1964), **neritic** (Hendey, 1964; Navarro, 1981a)

Note: Wood (1964) includes this taxon in *R. imbricata*

Code: **2-2-2-2-4 2-1-1-1-1 1-1-2-1-3**

ROPERIA TESSELATA (Roper) Grun.

Hustedt (1930, fig. 297); Hendey (1964, pl. 22, fig. 3)

Lifeform: **planktonic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964, 1974; Hustedt & Aleem, 1951; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982), **often planktonic** (Hustedt, 1930)

Salinity: **marine** (Cleve-Euler, 1951-1955; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **polyhalob.** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **euhalob., M** (Van der Werff & Huls, 1957-1974)

Temperature: **warm** (Hasle, 1976?)

Distribution: **cosmopol., mainly temperate** (Ricard, 1987)

Biotopes: **oceanic** (Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982), **neritic** (Cleve-Euler, 1951-1955; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **marine-littoral** (Hustedt, 1930; Van der Werff & Huls, 1957-1974)

Code: **2-2-2-2-0 0-1-1-1-1 1-1-2-1-3**

SKELETONEMA COSTATUM (Grev.) Cl.

Hustedt (1930, fig. 149); Hendey (1964, pl. 7, fig. 3-3b)

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Drebes & Elbrachter, 1976; Hendey, 1964, 1974; Hustedt, 1930, 1955; Hustedt & Aleem, 1951; John, 1983; Juggins, 1988; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Schulz, 1928; Shaffer & Sullivan, 1988; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988; Whiting & McIntire, 1985; Wilderman, 1987), **mainly planktonic** (van den Hoek et al., 1979), **tychoplanktonic** (Cleve-Euler, 1951-1955), **meroplanktonic** (Smayda, 1958), **planktonic-benthic** (Podelleck & Pankow, 1986), **benthic, often planktonic** (Conrad & Kufferath, 1954; Van Meel, 1965), **epontic** (Tanaka et al., 1984)

Salinity: **saline** (Mölder 1962), **marine** (Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982; Vos & de Wolf, 1988), **marine to brackish** (Bakker & De Pauw, 1974; John, 1983), **brackish** (Cleve-Euler, 1951-1955), **also brackish to fresh** (Wood, 1964), **polyhalob.** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **euhalob.** (Conrad & Kufferath, 1954; Van der Werff & Huls, 1957-1974), **eu- to mesohalob.** (Hustedt, 1939; Schulz, 1928), **M** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. pleioeuryhaline** (Pankow, 1976), **Sopt. 26.5 g/l** (Cleve-Euler, 1951-1955), **Sopt. 5 g/l** (Mölder & Tynni, 1967), **S 5-25 g/l** (Desikachary & Rao, 1972), **common at S 0.5-32 g/l** (van den Hoek et al. 1979), **Cl 6000-14000 mg/l** (Bakker & De Pauw, 1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **Cl 17000-20000 mg/l** (Wood, 1964), **euryhaline** (Florin, 1957; Hustedt, 1930, 1939; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Valente Moreira & Moreira Filho, 1982; Van Meel, 1965), **strongly euryhaline** (Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954)

Saprobity: **ß- to α-mesosaprob.** (Podelleck & Pankow, 1986)

Temperature: **eurythermal** (Hustedt, 1930; Mölder & Tynni, 1967; Navarro, 1981a; Smayda, 1958), **strongly eurythermal, opt. 3.4 °C** (Cleve-Euler, 1951-1955)

Distribution: **cosmopol.** (Hustedt, 1955; Navarro, 1981a)

Biotopes: **oceanic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **mainly neritic** (Hustedt, 1930), **neritic** (Cleve-Euler, 1951-1955; Hustedt, 1939; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Smayda, 1958; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Wood, 1964), **marine-littoral** (Conrad & Kufferath, 1954; Mölder & Tynni, 1967; Van Meel, 1965; Vos & de Wolf, 1988), **estuarine** (Conrad & Kufferath, 1954; Van Meel, 1965; Wilderman, 1987; Wood, 1964)

Code: **4-4-3-3-5 2-1-1-1-1 1-0-2-1-4**

STEPHANODISCUS HANTZSCHII Grun.

Germain (1981, pl. 9, fig. 9-17); Hustedt (1930, fig. 194)

Lifeform: **euplanktonic** (Gasse, 1986, 1987; Huber-Pestalozzi, 1942; Hustedt, 1957, 1959), **planktonic** (Bradbury & Winter, 1976; Cholnoky, 1968a; Cleve-Euler, 1951-1955; Foged, 1951; Germain, 1981; Hendey, 1974; Hustedt, 1925, 1946, 1950; Jørgensen, 1948; Juggins, 1988; Kalbe, 1973; König, 1974; Mölder & Tynni, 1968; Patrick & Reimer, 1966; Scheele, 1952; Simonsen, 1962; Symoens, 1957; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974), **tychoplanktonic, epontic** (Germain, 1936)

Salinity: **brackish to fresh** (Florin, 1957; Mölder, 1962), **weakly brackish to fresh** (Budde, 1930; Cleve-Euler, 1951-1955; Huber-Pestalozzi, 1942; Hustedt, 1930; Mölder & Tynni, 1968; Van der Werff & Huls, 1957-1974), **fresh** (Cholnoky, 1968a, 1970; Gasse, 1986; König, 1974), **oligohalob.** (Foged, 1978; Hustedt, 1939, 1957; Schulz 1928), **halophil.** (Budde, 1930?), **oligohalob. indif.** (Foged, 1948, 1949, 1954, 1968a, 1981, 1986c; Kolbe, 1927), **FB** (Van der Werff & Huls, 1957-1974), **oligohalob. meioeuryhaline** (Pankow, 1976), **oligohalob. mesoeuryhaline** (Simonsen, 1962; Ziemann, 1970), **mainly S <0.5 g/l** (Gasse, 1987), **S <0.5-5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **Clmax. 5000 mg/l** (Ziemann, 1970), **Cl 19-159 mg/l** (Foged, 1948), **tolerates some salt** (Germain, 1981), **low tolerance for salt** (Grimes & Rushforth, 1983), **hardly tolerates any osmotic pressure changes** (Cholnoky, 1968a, 1970)

Conductivity: **most <3000 µS/cm** (Fritz, & Battarbee 1988), **<1000 µS/cm** (Gasse, 1986)

pH: **alkaline** (Brugam, 1983), **alkaliphil.** (Dixit et al., 1988; Foged, 1968a, 1978, 1981, 1986c; Hustedt, 1957), **alkaliphil. to alkalibiont.** (Kalbe, 1973), **alkalibiont.** (Foged, 1948, 1949, 1954; Jørgensen, 1948; Van der Werff & Huls, 1957-1974), **opt. about or >8.2** (Cholnoky, 1968a), **opt. about 8.2** (Cholnoky, 1970), **mainly at about 8.6** (Gasse & Tekaia, 1983), **6.6-8.2** (Foged, 1948), **7.6->9** (Foged, 1977), **7-8.9** (Gasse, 1986), **6.8->9** (Jørgensen, 1948), **6.9-9** (Van der Werff & Huls, 1957-1974), **does not tolerate changes** (Cholnoky, 1968a)

Alkalinity: **low** (Gasse, 1986)

Trophic conditions: **oligo- to eutroph.** (Hustedt, 1938), **oligo- to hypertroph.** (Van der Werff & Huls, 1957-1974), **often eutroph.** (Foged, 1948), **eutroph.** (Battarbee, 1984; Bradbury, 1973, 1975; Cholnoky, 1970; Cleve-Euler, 1951-1955; Huber-Pestalozzi, 1942; Hustedt, 1942c, 1946, 1954; Jørgensen, 1948; Kalbe, 1973; Mölder & Tynni, 1968; Pankow, 1976), **strongly eutroph.** (Foged, 1954; Hustedt, 1930), **mainly strongly eutroph.** (Hustedt, 1938; Van der Werff & Huls, 1957-1974), **mainly extremely eutroph.** (Brugam, 1983), **at least facult. N-heterotroph.** (Cholnoky, 1968a, 1970), **oblig. N-heterotroph.** (Cholnoky, 1968a?)

Saprobity: **oligo- to polysaprob.** (Van der Werff & Huls, 1957-1974), **mesosaprob.** (Scheele, 1952), **α-mesosaprob.** (Kalbe, 1973; Sladecek, 1973), **polysaprob.** (Cleve-Euler, 1951-1955), **saprophil.** (Fabri & Leclercq, 1986), **saprophyt.** (Hustedt, 1954), **saprobiont.** (Fabri & Leclercq, 1984), **often strongly polluted** (Foged, 1948)

Oxygen: **meso- to polyoxybiont.** (Fabri & Leclercq, 1986), **euryoxybiont.** (Hustedt, 1957)

Current: **indif.** (Foged, 1948, 1954)

Biotopes: **littoral** (Kalbe, 1973), **sometimes xerotic** (Krasske, 1932), **various mainly more permanent waterbodies with not too strong currents**

Code: **2-12-14-9-10 3-3-2-3-2 3-1-2-4-4**

STEPHANODISCUS ROTULA (Kütz.) Hendey

Gasse (1986, pl. 5, fig. 1-2); Hustedt (1930, fig. 193 a-c); Huber-Pestalozzi (1942, fig. 505 a-c)

Synonym: *Stephanodiscus astraea* (Ehr.) Grun.

Lifeform: **euplanktonic** (Gasse, 1986, 1987; Huber-Pestalozzi, 1942; Hustedt, 1957, 1959; Maillard, 1977), **planktonic** (Behre, 1956; Brockmann, 1939, 1954; Cleve-Euler, 1951-1955; Foged, 1948, 1950, 1951; Hendey, 1974; Hustedt, 1925, 1938, 1942a, 1942b, 1942c, 1946; Jørgensen, 1948; Kalbe, 1973; König, 1974; Mölder & Tynni, 1968; Symoens, 1957; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974; von der Brelie, 1956; Vos & de Wolf, 1988), **tychoplanktonic** (Germain, 1936), **planktonic-benthic** (Gasse, 1986)

Salinity: **marine to brackish** (Hendey, 1964), **brackish to fresh** (Brockmann, 1928; Florin, 1957), **weakly brackish to fresh** (Brockmann, 1954; Cleve-Euler, 1951-1955; Giffen, 1967; Huber-Pestalozzi, 1942; Hustedt, 1930; Mölder & Tynni, 1968; Van der Werff & Huls, 1957-1974), **fresh** (Aleem, 1973; Brockmann, 1940; Cholnoky, 1968a, 1970; Grohne, 1959; Hustedt, 1942a; König, 1974; Mölder, 1962; Vos & de Wolf, 1988), **oligohalob.** (Hustedt, 1939, 1957; Ricard, 1977; Simonsen, 1962), **oligohalob. indif.** (Berg, 1952; Brockmann, 1954; Foged, 1948, 1949, 1954, 1964, 1968a, 1970, 1981, 1985a, 1985c, 1986a, 1986c, 1987; Kolbe, 1927; Petersen, 1943; Schulz, 1928), **FB** (Van der Werff, 1954; Van der Werff & Huls, 1957-1974), **oligohalob. meioeuryhaline** (Pankow, 1976), **Sopt. 2-4.5 g/l** (Mölder, 1943a), **mainly S <0.5 g/l** (Gasse, 1987), **S <0.5 g/l** (van den Hoek et al., 1979), **Cl 0-500 mg/l** (Vos & de Wolf, 1988), **tolerates weak osmotic pressure changes** (Cholnoky, 1968a, 1970), **euryhaline** (Ricard, 1977)

Conductivity: **<300->10000 µS/cm** (Gasse, 1986), **65-2000 µS/cm, mainly 65-200 µS/cm** (Niessen, 1956)

pH: **alkaline** (Round, 1964), **alkaliphil.** (Foged 1981, 1985a, 1986a, 1986c, 1987), **alkaliphil. to alkalibiont.** (Kalbe, 1973), **alkalibiont.** (Hustedt, 1957; Foged 1948, 1949, 1954, 1964, 1968a, 1970, 1972; Jørgensen, 1948; Van der Werff & Huls, 1957-1974), **opt. about 8.3** (Cholnoky, 1968a), **opt. >8.2** (Cholnoky, 1970), **mainly 6.5-7.4** (Foged, 1968b), **mainly 4->9** (Foged, 1977), **mainly 7->9.5** (Gasse, 1986), **mainly about 8.6** (Gasse & Tekaia, 1983), **7-9** (Behre, 1956), **<4->9** (Foged, 1977), **6->9.5** (Gasse, 1986), **6.3-9** (Jørgensen, 1948; Van der Werff & Huls, 1957-1974), **3.5-8.5** (Niessen, 1956)

Alkalinity: **very low to very high** (Gasse, 1986)

Calcium: **0-560 mg/l, opt. 0-140 mg/l** (Niessen, 1956), **140-560 mg/l** (Van der Werff & Huls, 1957-1974)

Trophic conditions: **oligo- to hypertroph.** (Van der Werff & Huls, 1957-1974), **meso- to eutroph.** (Cleve-Euler, 1951-1955), **eutroph.** (Brockmann, 1939, 1940, 1954; Foged, 1950, 1951; Huber-Pestalozzi, 1942; Hustedt, 1927a, 1930; Jørgensen, 1948; Kalbe, 1973; Pankow, 1976), **mainly eutroph.** (Foged, 1948; Hustedt, 1938; Van der Werff & Huls, 1957-1974), **high P requirement** (Kilham et al., 1986)

Saprobity: **saproxen.** (Hustedt, 1957; Kalbe, 1973), **oligo- to mesosaprob.** (Van der Werff & Huls, 1957-1974), **oligo- ß-mesosaprob.** (Sladecek, 1973)

Current: **limnophil.** (Foged, 1948, 1954; Schulz, 1928)

Temperature: **mesothermal eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Foged, 1985a, 1986a, 1987)

Light: **mainly clear water** (Cleve-Euler, 1951-1955)

Biotopes: **estuarine** (Hendey, 1964), **intertidal mud** (Grohne, 1959), **subaerial** (Behre & Schwabe, 1970), **various, mainly more permanent, waters with not too strong currents**

Note: data from Gasse (1986) include the var. *minutula*, which she attributes the same ecology

Code: **2-12-14-9-9 3-3-2-5-6 0-1-2-4-3**

STEPHANODISCUS ROTULA var. MINUTULA (Kütz.) Ross & Sims

Hustedt (1930, fig. 193 d-e)

Synonyms: *Stephanodiscus astraea* var. *minutula* (Kütz.) Grun.
Stephanodiscus minutula (Kütz.) Round

Lifeform: **euplanktonic** (Gasse, 1986; Hustedt, 1957, 1959), **planktonic** (Brander, 1935; Cleve-Euler, 1951-1955; Foged, 1951; Hustedt, 1942a, 1945, 1950, 1954; Jørgensen, 1948; Kalbe, 1973; Mölder & Tynni, 1968; Sims, 1978; Symoens, 1957; Van der Werff & Huls, 1957-1974), **mainly planktonic** (van den Hoek et al., 1979), **planktonic-benthic** (Gasse, 1986; van den Hoek et al., 1979; Van der Werff, 1960), **planktonic-epontic** (Germain, 1981), **planktonic-periphytic** (Bradbury, 1975)

Salinity: **brackish to fresh** (Florin, 1957), **weakly brackish to fresh** (Van der Werff & Huls, 1957-1974), **fresh** (Brander, 1935; Cholnoky, 1968a; Cleve-Euler, 1951-1955; Ehrlich 1975; Hustedt, 1942a; Mölder, 1962), **oligohalob.** (Ehrlich, 1975; Hustedt, 1939, 1957; Simonsen, 1962), **oligohalob. indif.** (Foged, 1948, 1949, 1954, 1964, 1965, 1968a, 1970, 1981, 1985a, 1985b, 1986a, 1987; Møller, 1950; Petersen, 1943), **FB** (Van der Werff, 1954, 1960; Van der Werff & Huls, 1957-1974), **oligohalob. meioeuryhaline** (Pankow, 1976), **Smax. 4 g/l** (Mölder, 1943a), **S <0.5-5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **Cl 17-5930 mg/l** (Foged, 1948), **tolerates weak osmotic pressure changes** (Cholnoky, 1968a)

Conductivity: **mainly <3000 µS/cm** (Fritz & Battarbee, 1988), **<300->10000 µS/cm** (Gasse, 1986), **26-12540 µS/cm** (Bradbury, 1975)

pH: **alkaliphil.** (Foged, 1965, 1968a, 1981, 1985a, 1985b, 1986a, 1987; Sims, 1978), **alkaliphil. to alkalibiont.** (Kalbe, 1973), **alkalibiont.** (Foged, 1948, 1949, 1954, 1964, 1970, 1972; Hustedt, 1957; Jørgensen, 1948; Van der Werff & Huls, 1957-1974), **opt. about 8.3** (Cholnoky, 1968a), **mainly 6.5-7.4** (Foged, 1968b), **mainly 6.6->9** (Foged, 1977), **mainly 7->9.5** (Gasse, 1986), **6.4-8.3** (Foged, 1948), **<4->9** (Foged, 1977), **6->9.5** (Gasse, 1986), **6.7-9** (Jørgensen, 1948), **6.3-9** (Van der Werff & Huls, 1957-1974)

Alkalinity: **very low to very high** (Gasse, 1986)

Calcium: **140-560 mg/l** (Van der Werff & Huls, 1957-1974)

Trophic conditions: **eurytopic** (Bradbury, 1975), **mesotroph.** (Cleve-Euler, 1951-1955), **eutroph.** (Battarbee, 1984; Foged, 1950, 1951; Jørgensen, 1948; Kalbe, 1973; Pankow, 1976), **more eutroph. than the species** (Van der Werff & Huls, 1957-1974), **high P requirement** (Kilham et al., 1986)

Saprobity: **saproxen.** (Hustedt, 1957)

Current: **indif.** (Foged, 1948, 1954)

Distribution: **cosmopol.** (Foged, 1985a, 1985b, 1986a, 1987)

Biotopes: **neritic** (Van der Werff, 1960), **littoral** (Sims, 1978), **subaerial** (Behre & Schwabe, 1970), **sometimes xerotic** (Bock, 1962, 1970), **various, sometimes even periodic waterbodies with not too strong currents**

Code: **2-12-14-9-9 4-3-2-0-0 0-1-3-4-3**

STEPHANOPYXIS TURRIS (Grev. & Arnott) Ralfs

Hustedt (1930, fig. 140)

Lifeform: **planktonic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964, 1974; Hustedt, 1930, 1939, 1955; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; von Stosch, 1956), **meroplanktonic** (Smayda, 1958), **planktonic-benthic** (van den Hoek et al., 1979)

Salinity: **saline** (Mölder, 1943a), **marine** (Brockmann, 1928, 1930, 1932, 1934; Cleve-Euler, 1951-1955; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Valente Moreira & Moreira Filho, 1982), **euhalob.** (Hustedt, 1939; Van der Werff & Huls, 19571974), **polyhalob.** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **M** (Van der Werff, 1954; Van der Werff & Huls, 1957-1974), **polyhalob. oligoeuryhaline** (Pankow, 1976), **S 18-32 g/l** (van den Hoek et al., 1979), **Cl 9900-19900 mg/l** (Wood, 1964), **stenohaline** (Hustedt, 1939)

Distribution: **tropical-subtropical** (Wood, 1964), **temperate** (Cleve-Euler, 1951-1955), **mainly cold-temperate** (Ricard, 1987), **cosmopol.** (Hustedt, 1955)

Biotopes: **oceanic** (Smayda, 1958; Valente Moreira & Moreira Filho, 1982; Wood, 1964), **neritic** (Hendey, 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Ricard, 1987; Smayda, 1958; Valente Moreira & Moreira Filho, 1982; Wood, 1964), **estuarine** (Wood, 1964)

Code: **2-2-2-2-2 4-1-1-1-1 1-1-2-1-2**

THALASSIOSIRA BALTICA (Grun.) Ostenf.

Hustedt (1930, fig. 164)

Lifeform: **planktonic** (Cholnoky, 1968a; Conrad & Kufferath, 1954; Hendey, 1974; Mölder, 1943a; Mölder & Tynni, 1967; Van der Werff & Huls, 1957-1974), **tychoplanktonic** (Cleve-Euler, 1951-1955)

Salinity: **saline** (Mölder, 1943a), **brackish** (Cholnoky 1968a, 1968b; Florin, 1957; Hendey, 1964; Hustedt, 1930; Mölder, 1962; Mölder & Tynni, 1967), **brackish to nearly fresh** (Cleve-Euler, 1951-1955), **brackish to fresh** (Van der Werff & Huls, 1957-1974), **eu- to mesohalob.** (Schulz, 1928), **mesohalob.** (Berg, 1952; Brockmann, 1940, 1954; Conrad & Kufferath, 1954; Pankow, 1976; Van der Werff & Huls, 1957-1974), **B** (Van der Werff & Huls, 1957-1974), **Sopt. 8 g/l** (Cleve-Euler, 1951-1955), **Sopt. >7 g/l, Smin. 5 g/l** (Mölder, 1943a), **S 4-6 g/l** (Mölder, 1962), **mainly Cl >5000 mg/l** (Florin, 1957), **stenohaline** (Conrad & Kufferath, 1954?), **rather euryhaline** (Van der Werff & Huls, 1957-1974)

Temperature: **cold, opt. -2.8 °C** (Cleve-Euler, 1951-1955)

Biotopes: **neritic** (Cleve-Euler, 1951-1955), **estuarine** (Conrad & Kufferath, 1954), **mainly rivermouths, bays and marine-littoral**

Code: **2-8-5-4-6 2-1-1-1-1 1-1-2-1-3**

THALASSIOSIRA BRAMAPUTRAE (Ehr.) Håkansson & Locker

Germain (1981, pl. 11, fig. 1-2); Hustedt (1930, fig. 235 a-b); John (1983, pl. 4, fig. 5-7)

Synonyms: *Coscinodiscus lacustris* Grun.
Thalassiosira lacustris (Grun.) Hasle

Lifeform: **planktonic** (Behre, 1956; Brockmann, 1935; Cholnoky, 1968a; Germain, 1981; Hustedt, 1957, 1959; John, 1983; Juggins, 1988; König, 1974; Mölder, 1943a; Mölder & Tynni, 1968; Schulz, 1928; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **rather planktonic** (Cleve-Euler, 1951-1955), **tychoplanktonic** (Symoens, 1957), **planktonic-benthic** (Pankow, 1976; van den Hoek et al., 1979; Van der Werff, 1960)

Salinity: **saline** (Hustedt, 1942a), **marine to brackish** (John, 1983), **brackish** (Berg, 1945; Cholnoky, 1968a; Cleve-Euler, 1951-1955; Mahood et al., 1986), **brackish to fresh** (Grohne, 1959; Huber-Pestalozzi, 1942; Mölder, 1962; Van der Werff & Huls, 1957-1974), **weakly brackish to fresh** (Mölder & Tynni, 1968), **fresh** (König, 1974; Mölder, 1943a; Salden, 1978), **upper brackish** (Brockmann, 1940, 1954), **mesohalob.** (Florin, 1957; Foged, 1981, 1987; Hustedt, 1939; Pankow, 1976; Simonsen, 1962; Van der Werff & Huls, 1957-1974), **ß-mesohalob.** (Hustedt, 1957), **halophil.** (Brockmann, 1954; Foged, 1981?; Huber-Pestalozzi, 1942; Symoens, 1957), **B** (Van der Werff, 1954), **BF** (Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **Sopt. 1-4 g/l** (Mölder, 1943a), **S <0.5-30 g/l, mainly 0.5-18 g/l** (van den Hoek et al., 1979), **Cl 1000-17000 mg/l** (Vos & de Wolf, 1988), **euryhaline** (Hustedt, 1939, 1942a; Simonsen, 1962; Van der Werff & Huls, 1957-1974)

pH: **indif. to alkaliphil.** (Hustedt, 1957), **alkaliphil.** (Foged, 1981), **7-9** (Behre, 1956)

Trophic conditions: **oligo- to eutroph.** (Van der Werff & Huls, 1957-1974)

Saprobity: **oligo- to ß-mesosaprob.** (Van der Werff & Huls, 1957-1974)

Oxygen: **mesooxybiont.** (Hustedt, 1957)

Biotopes: **neritic** (Van der Werff, 1960), **littoral** (Huber-Pestalozzi, 1942; Hustedt 1930, 1959), **estuarine** (Vos & de Wolf, 1988), **various permanent waterbodies, mainly coastal lakes, estuaries and rivers, also marine-littoral**

Code: **4-10-7-4-6 2-4-9-5-6 3-0-2-4-3**

THALASSIOSIRA DECIPIENS (Grun.) Jørgensen

Hasle (1979, pl. 1-8, fig. 1-42, excl. pl. 6, fig. 33-34); Hustedt (1930, fig. 158); Rivera (1981, pl. 71, fig. 438-442)

Lifeform: **planktonic** (Berg & Hessland, 1949; Cholnoky, 1968a; Hendey, 1974; Hustedt, 1930, 1939, 1955; Hustedt & Aleem, 1951; Juggins, 1988; Mölder & Tynni, 1967; Moreira Filho & Valente Moreira, 1984; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **tychoplanktonic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976), **meroplanktonic** (Smayda, 1958), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960), **mainly benthic** (van den Hoek et al., 1979), **benthic** (Shaffer & Sullivan, 1988), **possibly more common epontic than planktonic** (Hasle, 1979), **epontic** (Navarro, 1982)

Salinity: **saline** (Mölder, 1962), **marine** (Brockmann, 1928, 1930, 1932, 1934; Cholnoky, 1968a; Hustedt, 1957; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; von der Brelie, 1956; Vos & de Wolf, 1988), **marine to brackish** (Cleve-Euler, 1951-1955), **mainly brackish** (Mahood et al., 1986), **abundant in brackish** (Simonsen, 1962), **polyhalob.** (Foged, 1985b, 1986a, 1986b), **euhalob.** (Hustedt, 1939), **rather euhalob.** (Van der Werff & Huls, 1957-1974), **eu- to mesohalob.** (Schulz, 1928), **M** (Van der Werff, 1960), **M-MB** (Van der Werff & Huls, 1957-1974), **polyhalob. mesoeuryhaline** (Pankow, 1976), **S 30-40 g/l** (Navarro, 1982), **S 0.5-32 g/l, mainly 30-32 g/l** (van den Hoek et al., 1979), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **does not tolerate osmotic pressure changes** (Cholnoky, 1968a), **varying salinity, very euryhaline** (Hasle, 1979), **euryhaline** (Hustedt, 1957)

Temperature: **cold oligo-eurythermal** (Baars, 1979)

Distribution: **mainly northern** (Hustedt, 1930), **mainly temperate** (Foged, 1985b), **temperate-tropical** (Foged, 1986a), **cosmopol.** (Foged, 1986b; Hustedt, 1955)

Biotopes: **oceanic** (Smayda, 1958), **neritic** (Cleve-Euler, 1951-1955; Moreira Filho & Valente Moreira, 1984; Smayda, 1958; Valente Moreira & Moreira Filho, 1982; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **marine-littoral** (Cholnoky, 1968b; Hustedt, 1930; Mölder & Tynni, 1967; Vos & de Wolf, 1988), **subtidal, intertidal** (Navarro, 1982), **estuarine**

Note: according to Hasle (1979) this species is often confused with *Thalassiosira angulata* (Greg.) Hasle

Code: **3-3-3-3-4 2-1-1-1-1 1-0-2-1-3**

THALASSIOSIRA ECCENTRICA (Ehr.) Cl.

Hustedt (1930, fig. 201); Hendey (1964, pl. 24, fig. 7); John (1983, pl. 4, fig. 1-4); Rivera (1981, pl. 20, fig. 129-134)

Synonym: *Coscinodiscus eccentricus* Ehr.

Lifeform: **planktonic** (Bakker & De Pauw, 1974; Brockmann, 1935, 1940, 1954; Cleve-Euler, 1951-1955; Ehrlich, 1975; Giffen, 1975; Hendey, 1964; Hustedt, 1930, 1939; Hustedt & Aleem, 1951; John, 1983; Rao & Lewin, 1976?; Shaffer & Sullivan, 1988; Simonsen, 1962; Van der Werff & Huls, 1957-1974; von Stosch, 1956; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **tychoplanktonic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **meroplanktonic** (Abrantes, 1988), **planktonic-benthic** (van den Hoek et al., 1979; Van der Werff, 1960), **planktonic-epontic** (König, 1974), **epontic** (Navarro, 1982)

Salinity: **marine** (Brockmann, 1930, 1932, 1934; Cleve-Euler, 1951-1955; Ehrlich, 1975; Grohne, 1959; Heck & Brockmann, 1950; Hustedt, 1930, 1955, 1957; König, 1974; Mölder & Tynni, 1968; Navarro, 1981a; Vos & de Wolf, 1988; Van der Werff & Huls, 1957-1974), **marine to strongly brackish** (Brockmann, 1928), **marine to brackish** (Bakker & De Pauw, 1974; Brockmann, 1954; John, 1983), **lower brackish** (Brockmann, 1940), **polyhalob.** (Foged, 1986a, 1986b, 1986c, 1987; Simonsen, 1962), **euhalob.** (Berg, 1952; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **eu- to mesohalob.** (Brockmann, 1954), **M** (Van der Werff, 1954), **MB** (Munda, 1967; Van der Werff, 1960; Van der Werff & Huls, 1957-1974), **polyhalob. meio- to mesoeuryhaline** (Pankow, 1976), **S 26-40 g/l** (Navarro, 1982), **Sopt. 33.5 g/l** (Cleve-Euler, 1951-1955), **common at S 5-32 g/l** (van den Hoek et al., 1979), **Cl 6000-14000 mg/l** (Bakker & De Pauw, 1974), **Clmin. 18000 mg/l** (Wood, 1964), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **stenohaline** (Ehrlich, 1975), **euryhaline** (Hustedt, 1939, 1957; Moreira Filho & Valente Moreira, 1984; Navarro, 1981a; Ricard, 1977; Valente Moreira & Moreira Filho, 1982)

Temperature: **warm meso-eurythermal** (Baars, 1979), **mesothermal eurythermal** (Ricard, 1977), **opt. 7.3 °C** (Cleve-Euler, 1951-1955)

Distribution: **northern hemisphere** (Hustedt, 1955), **cosmopol.** (Foged, 1986a, 1986b, 1987; Hasle, 1976; Navarro, 1981a; Rivera, 1981)

Biotopes: **oceanic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Navarro, 1981a), **neritic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Ehrlich, 1975; Hendey, 1964; Navarro, 1981a; Van der Werff, 1960), **marine-littoral** (Cholnoky, 1968b; Giffen, 1975; Mahood et al., 1986; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Vos & de Wolf, 1988), **estuarine** (Navarro, 1981a), **subtidal, intertidal, supratidal** (Navarro, 1982), **salt-marsh** (Sullivan, 1978)

Code: **3-4-2-2-4 2-1-1-1-1 1-0-2-1-3**

THALASSIOSIRA ECCENTRICA var. FASCICULATA (Hust.) Nizamuddin

Hustedt (1930, fig. 202)

Synonym: *Coscinodiscus eccentricus* var. *fasciculata* Hust.

Lifeform: **planktonic** (Cleve-Euler, 1951-1955; Hustedt, 1939), **planktonic-epontic** (König, 1974)

Salinity: **saline** (Mölder, 1962), **marine** (Cleve-Euler, 1951-1955; König, 1974), **slightly brackish** (Brockmann, 1954), **polyhalob.** (Foged, 1986c; Simonsen, 1962), **euhalob.** (Gotoh, 1978; Hustedt, 1939), **polyhalob. meio- to mesoeuryhaline** (Pankow, 1976), **euryhaline** (Hustedt, 1939)

Distribution: **arctic** (Cleve-Euler, 1951-1955)

Biotopes: **marine-littoral, bays and estuaries**

Note: Cleve-Euler (1951-1955) lists this taxon as *Thalassiosira kryophilus* Grun.

Code: **3-4-3-3-4 2-1-1-1-1 1-0-2-1-3**

THALASSIOSIRA GRAVIDA Cl.

Hendey (1964, pl. 1, fig. 7); Hustedt (1930, fig. 161); Rivera (1981, pl. 70, fig. 437)

Lifeform: **planktonic** (Cleve-Euler, 1951-1955; Hendey, 1974; Hustedt, 1930, 1939; van den Hoek et al., 1979)

Salinity: **marine** (Cleve-Euler, 1951-1955; Tynni, 1980), **polyhalob.** (Foged, 1977), **euhalob.** (Berg, 1952; Hustedt, 1939), **Sopt. 32 g/l** (Cleve-Euler, 1951-1955), **Smin. 7-15 g/l** (Smayda, 1958), **S 18-30 g/l** (van den Hoek et al., 1979), **stenohaline** (Hustedt, 1939)

pH: **7.8-9** (Foged, 1977)

Temperature: **cold, opt. 4.2 °C** (Cleve-Euler, 1951-1955)

Distribution: **arctic** (Cleve-Euler, 1951-1955), **cosmopol.?** (Hasle, 1976), **boreal** (Hendey, 1964)

Biotopes: **mainly oceanic** (Smayda, 1958), **neritic** (Cleve-Euler, 1951-1955; Van Meel, 1965), **marine-littoral** (Hustedt, 1930), **estuarine**

Code: **2-2-2-2-4 2-1-1-1-1 1-1-2-1-3**

THALASSIOSIRA LEPTOPA (Grun.) Hasle & Fryxell

Hustedt (1930, fig. 204)

Synonym: *Coscinodiscus lineatus* Ehr.

Lifeform: **planktonic** (Abrantes, 1988; Ehrlich, 1975; Hendey, 1964, 1970, 1974; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979), **planktonic-benthic** (Van der Werff, 1960), **benthic, rarely planktonic** (Cleve-Euler, 1951-1955)

Salinity: **marine** (Cleve-Euler, 1951-1955; Ehrlich, 1975; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **polyhalob.** (Foged, 1981,

1986a), **eu- to mesohalob.** (Berg, 1952), **M** (Van der Werff, 1960), **polyhalob. meioeuryhaline** (Pankow, 1976), **S <0.5-32 g/l, mainly 30-32 g/l** (van den Hoek et al., 1979), **stenohaline** (Ehrlich, 1975)

Temperature: **cryophil.** (Margalef, 1956)

Distribution: **cosmopol.** (Foged, 1986a)

Biotopes: **oceanic** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **neritic** (Ehrlich, 1975; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Van der Werff, 1960), **estuarine tidal flat** (Riznyk, 1973), **marine-littoral**

Code: **4-2-2-2-3 3-1-1-1-1 1-0-2-1-3**

THALASSIOSIRA LEVANDERI van Goor

Cleve-Euler (1951-1955, Part 1, fig. 128)

Synonym: *Coscinodiscus levanderi* (van Goor) Cl.-E.

Lifeform: **planktonic** (Hustedt, 1930), **tychoplanktonic** (Drebes & Elbrachter, 1976)

Salinity: **weakly brackish** (Cleve-Euler, 1951-1955), **ß-mesohalob.** (Pankow, 1976?)

Biotopes: **marine-littoral, bays, estuaries**

Note: considerably smaller than *T. decipiens* but very similar in structure and perhaps related

Code: **2-8-7-4-0 0-4-2-5-0 0-0-2-0-4**

THALASSIOSIRA NORDENSKIOELDII Cl.

Hustedt (1930, fig. 157)

Lifeform: **plankton** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1974; Hustedt, 1930, 1939; Moreira Filho & Valente Moreira, 1984; Rao & Lewin, 1976?; Simonsen, 1962; Valente Moreira & Moreira Filho, 1982; van den Hoek et al., 1979; Van der Werff & Huls, 1957-1974)

Salinity: **marine** (Cleve-Euler, 1951-1955; Mahood et al., 1986; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **polyhalob.** (Simonsen, 1962), **euhalob.** (Berg, 1952; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff & Huls, 1957-1974), **polyhalob. meioeuryhaline** (Pankow, 1976; Simonsen, 1962?; Tynni, 1980), **Sopt. 28 g/l** (Cleve-Euler, 1951-1955), **Smin. 7-15 g/l** (Smayda, 1958), **S 18-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **stenohaline** (Hustedt, 1939), **euryhaline** (Berg, 1952)

Temperature: **cold** (Cleve-Euler, 1951-1955; Hasle, 1976; Tynni, 1980), **cold oligo-eurythermal** (Baars, 1979), **eurythermal** (Berg, 1952), **opt. 2.3 °C** (Cleve-Euler, 1951-1955)

Distribution: **arctic** (Hendey, 1964), **arctic-boreal** (Cleve-Euler, 1951-1955), **northern hemisphere** (Hasle, 1976), **mainly northern** (Hustedt, 1930)

Biotopes: **mainly oceanic** (Smayda, 1958), **neritic** (Cleve-Euler, 1951-1955; Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **marine-littoral** (Hustedt, 1930; Mahood et al., 1986), **estuarine**

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-4**

THALASSIOSIRA OESTRUPII (Ostenf.) Hasle

Hustedt (1930, fig. 155); Rivera (1981, pl. 42, fig. 263-266)

Synonym: *Coscinosira oestrupii* Ostenf.

Lifeform: **planktonic** (Abrantes, 1988; Hendey, 1964, 1974; Hustedt, 1930)

Salinity: **polyhalob.** (Foged, 1986a; Tynni, 1980)

Temperature: **warm** (Abrantes, 1988)

Distribution: **cosmopol.** (Rivera, 1981)

Biotopes: **mainly oceanic and neritic, also marine-littoral**

Code: **2-2-2-2-0 0-1-1-1-1 1-1-2-1-3**

THALASSIOSIRA SUBTILIS (Ostenf.) Gran

Hustedt (1930, fig. 166); Rivera (1981, pl. 58, fig. 359-368)

Lifeform: **planktonic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964, 1974; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Valente Moriera & Moreira Filho, 1982)

Salinity: **marine** (Cleve-Euler, 1951-1955; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **S 15-30 g/l** (Desikachary & Rao, 1972), **equihalob.** (Ricard, 1977)

Temperature: **mesothermal eurythermal** (Ricard, 1977)

Distribution: **cosmopol.** (Hasle, 1976; Rivera, 1981)

Biotopes: **oceanic** (Cleve-Euler, 1951-1955; Drebes & Elbrachter, 1976; Hendey, 1964; Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982; Wood, 1964), **also neritic and marine-littoral**

Code: **2-2-2-2-3 3-1-1-1-1 1-1-2-1-4**

THALASSIOSIRA WEISSFLOGII (Grun.) Fryxell & Hasle

Germain (1981, pl. 10, fig. 14-16); Hustedt (1930, fig. 165); Rivera (1981, pl. 63, fig. 390-394)

Synonym: *Thalassiosira fluviatilis* Hust.

Lifeform: **planktonic** (Germain, 1981; Hendey, 1974; Huber-Pestalozzi, 1942; Hustedt, 1930, 1957, 1959; John, 1983; Kalbe, 1973; van den Hoek et al., 1979)

Salinity: **marine to fresh** (Carpelan, 1978), **brackish** (Cholnoky, 1968a; Hendey, 1964; John, 1983), **fresh to brackish** (Mölder, 1962; Van der Werff & Huls, 1957-1974), **fresh** (Germain, 1981; Huber-Pestalozzi, 1942; Hustedt, 1930), **mesohalob.** (Foged, 1948, 1949, 1954, 1977; Kolbe & Tiegs, 1929; Möller, 1950; Scheele, 1952, 1956), **ß-mesohalob.** (Budde, 1931?), **mesohalob. to halophil.** (Budde, 1930), **ß-mesohalob. to halophil.** (Hustedt, 1957), **halophil.** (Budde, 1931; Foged, 1986c; Huber-Pestalozzi, 1942; Hustedt, 1930; Pankow, 1976; Van der Werff & Huls, 1957-1974), **BF** (Van der Werff & Huls, 1957-1974), **mesohalob. holoeuryhaline** (Carpelan, 1978), **S 10-43 g/l** (Carpelan, 1978), **S <0.5-5 g/l, mainly <0.5 g/l** (van den Hoek et al., 1979), **rather abundant at S 3,06 g/l** (Rivera, 1981), **abundant at Cl 5000 mg/l** (Kalbe, 1963), **Cl 500-3000 mg/l** (Budde, 1931), **Cl 1400-1700 mg/l** (Budde, 1933), **Cl 20-5930 mg/l** (Foged, 1948), **Cl 13-50 mg/l** (Scheele, 1952), **tolerates strong osmotic pressure changes** (Cholnoky, 1968a)

pH: **alkaliphil.** (Foged, 1948?, 1986c; Hustedt, 1957), **6.6-8** (Foged, 1948), **7-7.8** (Foged, 1977), **7-9** (Germain, 1981)

Saprobity: **saprophyt.** (Hustedt, 1957)

Current: **limnophil.** (Foged, 1948?)

Distribution: **cosmopol.** (Rivera, 1981)

Biotopes: **estuarine** (Hendey, 1964), **various permanent waterbodies with not too strong currents, also at higher salinity**

Code: **2-10-12-7-7 2-4-0-5-0 0-1-2-4-4**

TRICERATIUM ANTEDILUVIANUM (Ehr.) Grun.

Hustedt (1930, fig. 472); Navarro (1982, pl. 9, fig. 5-6)

Synonym: *Biddulphia antediluviana* (Ehr.) V. H.

Lifeform: **planktonic** (van den Hoek et al., 1979), **meroplanktonic** (Moreira Filho & Valente Moreira, 1984), **benthic** (Abrantes, 1988), **epontic** (Berg & Hessland, 1950; Edsbagge, 1968; Hendey, 1977; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Navarro, 1982; Van der Werff & Huls, 1957-1974)

Salinity: **marine** (Brockmann, 1932, 1934; Cleve-Euler, 1951-1955; Ehrlich, 1975; Heck & Brockmann, 1950; Hustedt, 1930), **marine to brackish** (Brockmann, 1928), **polyhalob.** (Foged, 1985a, 1985b, 1986a, 1986b), **euhalob.** (Berg & Hessland, 1950; Hustedt, 1939; Van der Werff & Huls, 1957-1974), **M** (Van der Werff & Huls, 1957-1974), **S 30-40 g/l** (Navarro, 1982), **S 18-30 g/l** (van den Hoek et al., 1979), **stenohaline** (Ehrlich, 1975)

Temperature: **high** (Van der Werff & Huls, 1957-1974), **thermophil.** (Margalef, 1956), **mesothermal stenothermal** (Ricard 1977)

Distribution: **cosmopol.** (Foged, 1985a, 1985b, 1986a, 1986b; Hustedt, 1955)

Biotopes: **oceanic** (Cleve-Euler, 1951-1955), **marine-littoral** (Hendey, 1957, 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Van der Werff & Huls, 1957-1974), **subtidal** (Navarro, 1982)

Code: **6-2-2-2-0 3-1-1-1-1 1-0-2-1-2**

TRICERATIUM FAVUS Ehr.

Hustedt (1930, fig. 462-463); Hendey (1964, pl. 25, fig. 4)

Lifeform: **planktonic** (Hendey, 1974; Hustedt, 1930; van den Hoek et al., 1979; Vos & de Wolf, 1988), **mainly planktonic** (Hustedt, 1957), **often planktonic** (Hendey, 1964), **rarely planktonic** (Cleve-Euler, 1951-1955; Uherkovich, 1970; Van Meel, 1965), **planktonic-benthic** (Van der Werff & Huls, 1957-1974), **epontic** (Navarro, 1982)

Salinity: **marine** (Brockmann, 1928, 1932; Cholnoky, 1968a; Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954; Ehrlich, 1975; Grohne, 1959; Heck & Brockmann, 1950; Hustedt, 1930; Körber-Grohne, 1967; von der Brelie, 1956; Vos & de Wolf, 1988), **polyhalob.** (Foged, 1986a; Hustedt, 1957; Valente Moreira & Moreira Filho, 1982), **euhalob.** (Hustedt, 1939; Moreira Filho & Valente Moreira, 1984; Van der Werff & Huls, 1957-1974), **M** (Munda, 1967; Van der Werff, 1954; Van der Werff & Huls, 1957-1974), **S 26-40 g/l** (Navarro, 1982), **S 18-32 g/l** (van den Hoek et al., 1979), **S >30 g/l** (Van der Werff & Huls, 1957-1974), **Cl 15000-17000 mg/l** (Vos & de Wolf, 1988), **equihalob.** (Ricard, 1977), **stenohaline** (Conrad & Kufferath, 1954; Ehrlich, 1975), **euryhaline** (Moreira Filho & Valente Moreira, 1984; Ricard, 1977; Valente Moreira & Moreira Filho, 1982)

Temperature: **mesothermal** (Ricard, 1977)

Light: **tolerates low intensities** (Hopkins, 1964)

Distribution: **cosmopol.** (Foged, 1986a?; Hustedt, 1955)

Biotopes: **neritic** (Hustedt, 1930; Van Meel, 1965), **marine-littoral** (Cleve-Euler, 1951-1955; Conrad & Kufferath, 1954; Drebes & Elbrachter, 1976; Hendey, 1957, 1964; Hustedt, 1930; Moreira Filho & Valente Moreira, 1984; Uherkovich, 1970; Valente Moreira & Moreira Filho, 1982; Van der Werff & Huls, 1957-1974; Van Meel, 1965; Vos & de Wolf, 1988), **estuarine** (Moreira Filho & Valente Moreira, 1984; Valente Moreira & Moreira Filho, 1982), **tidal flat** (König, 1959), **lowest mud flat** (Hopkins, 1964), **subtidal** (Navarro, 1982), **does not tolerate dessication** (Hopkins, 1964)

Code: **4-2-2-2-0 3-1-1-1-1 1-0-2-1-2**

2. REFERENCES

ABRANTES, F., 1988. Diatom productivity peak and increased circulation during latest Quaternary: Alboran Basin (western Mediterranean). Mar. Micropaleont., 13: 79-96.

ALEEM, A.A., 1950a. Distribution and ecology of British marine littoral diatoms. J. Ecol., 38: 75-106.

ALEEM, A.A., 1950b. The diatom community inhabiting the mud-flats at Whitstable. New Phytol., 9: 174-188.

ALEEM, A.A., 1973. Contribution to the study of littoral diatoms on the west coast of Sweden. Bot. Marina, 16: 193-200.

AMSPOKER, M.C., 1977. The distribution of intertidal epipsammic diatoms on Scripps Beach, La Jolla, California, USA. Bot. Marina, 20: 227-232.

ANDO, K., 1977. Moss diatoms in Japan (1). Bull. Jap. Soc. Phycol., 25: 195-201.

ANDREWS, G.W., 1986. Miocene diatoms from Richmond, Virginia. J. Palaeontol., 60: 497-538.

ANTOINE, S.E. & K. BENSON-EVANS, 1986. The epipelic algal flora of the River Wye system, Wales, U.K. 2. Algal phyla and species population dynamics. Int. Revue ges. Hydrobiol., 71: 813-839.

AYKULU, G., 1982. The epipelic algal flora of the River Avon. Br. Phycol. J., 17: 27-38.

BAARS, J.W.M., 1979. Autecological investigations on marine diatoms. 1. Experimental results in biogeographical studies. Hydrobiol. Bull., 13: 123-137.

BAARS, J.W.M., 1986. Autecological investigations on marine diatoms. 4. *Biddulphia aurita* (Lyngb.) Brébisson et Godey - a succession of spring diatoms. Hydrobiol. Bull., 19: 109-116.

BAKKER, C. & N. DE PAUW, 1974. Comparison of brackish water plankton assemblages of identical salinity ranges in an estuarine tidal (Westerschelde) and stagnant (Lake Veere) environment (S.W. Netherlands). I. Phytoplankton. Hydrobiol. Bull., 8: 179-189.

BATTARBEE, R.W., 1984. Spatial variations in the water quality of Lough Erne, Northern Ireland, on the basis of surface sediment diatom analysis. Freshwater Biol., 14: 539-545.

BEGER, H., 1927. Beiträge zur Ökologie und Soziologie der luftlebigen (atmophytischen) Kieselalgen. Ber. Deutsch. Bot. Ges., 45: 385-407.

BEHRE, K., 1956. Die Algenbesiedlung einiger Seen aus Bremen und Bremerhaven. Veröff. Inst. Meeresforsch. Bremerhaven, 4: 221-383.

BEHRE, K. & G.H. SCHWABE, 1970. Auf Surtsey/Island im Sommer 1968 nachgewiesene nicht marine Algen. Schr. Naturw. Ver. Schlesw.-Holst., Sonderband: 31-100, 3 pl.

BELCHER, J.H. & E.M.F. SWALE, 1978. *Skeletonema potamos* (Weber) Hasle and *Cyclotella atomus* Hustedt (Bacillariophyceae) in the plankton of rivers in England and France. Br. Phycol. J., 13: 177-182.

BERG, Å., 1945. Diatomeen von der Sophia-Expedition im Jahre 1883. Ark. Bot., 32A: 1-34, 7 pl.

BERG, Å., 1952. Eine Diatomeengemeinschaft an der schwedischen Ostküste. Ark. Bot., 2: 1-39, 4 pl.

BERG, Å. & I. HESSLAND, 1950. A Quaternary diatom spectrum from Bohuslän. Ark. Mineral. Geol., 1: 169-198, 3 pl.

BOCK, W., 1962. Diatomeen extrem trockener Standorte. Nova Hedwigia, 5: 199-254, 3 pl.

BOCK, W., 1970. Felsen und mauern als diatomeenstandorte. Nova Hedwigia Beih., 31: 395-441.

BRADBURY, J.P., 1973. Ecology of freshwater diatoms. Nova Hedwigia, 24: 145-168.

BRADBURY, J.P., 1975. Diatom stratigraphy and human settlement in Minnesota. Geol. Soc. America Special Paper, 171: 1-74.

BRADBURY, J.P. & T.C. WINTER, 1976. Areal distribution and stratigraphy of diatoms in the sediments of lake Sallie, Minnesota. Ecology, 57: 1005-1014.

BRADLER, E., 1935. Die Brackwasser-Diatomeen im Esperstedter Ried. Mitt. Thüring. Bot. Ver., 42: 42-64, 2 pl.

BRANDER, G., 1935. Die baltische Diatomeen-Succession des Bålen-Beckens. Geol. Fören. Förhandl., 57: 318-340.

BRENDEMÜHL, I., 1947. Über die Verbreitung der Erddiatomeen. Arch. Mikrobiol., 14: 405-449.

BROCKMANN, C., 1928. Die Diatomeen im marinen Quartär Hollands. Abh. Senckenb. Naturf. Ges., 41: 3-187, 4 pl.

BROCKMANN, C., 1930. Interglaziale Brackwasserablagerungen an der deutschen Nordseeküste. Abh. Naturw. Ver. Bremen, 27: 331-340.

BROCKMANN, C., 1932. Die Diatomeen aus dem Interglazial von Oldenbüttel. p. 45-59, 3 pl. In: Heck, H.-L., Die Eem- und ihre begleitenden Jungінterglazial Ablagerungen bei Oldenbüttel in Holstein. Abh. Preusz. Geol. Landesanstalt N.F., 140: 1-80.

BROCKMANN, C., 1934. Die Diatomeen aus dem marinen Interglazial von Nindorf. Abh. Naturw. Ver. Bremen, 29: 74-82.

BROCKMANN, C., 1935. Diatomeen und Schlick im Jade-Gebiet. Abh. Senckenb. Naturf. Ges., 430: 1-64.

BROCKMANN, C., 1939. Die Diatomeen in den Ablagerungen der Grossen Jasmunder Boddens. Geol. Meere Binnengewässer, 3: 527-531.

BROCKMANN, C., 1940. Diatomeen als Leitfossilien in Küstenablagerungen. Westküste, 2: 150-181.

BROCKMANN, C., 1941. Der obere Darg im Hafengebiet von Bremerhaven. Jb. Reichsst. Bodenforsch., 60: 341-349.

BROCKMANN, C., 1950. Die Watt-Diatomeen des schleswig-holsteinischen Westküste. Abh. Senckenb. Naturf. Ges., 478: 1-26, 6 pl.

BROCKMANN, C., 1954. Die Diatomeen in den Ablagerungen der ostpreussischen Haffe. Meyniana, 3: 1-95, 10 pl.

BRUGAM, R.B., 1983. The relationship between fossil diatom assemblages and limnological conditions. Hydrobiologia, 98: 223-235.

BRUGAM, R.B. & M. LUSK, 1986. Diatom evidence for neutralization in acid surface mine lakes. p. 115-129. In: Smol, J.P., Battarbee, R.W., Davis, R.B. & J. Meriläinen (eds): Diatoms and lake acidity. Dr. W. Junk Publ., Dordrecht.

BUDDE, H., 1930. Die mesohaloben und halophilen Diatomeen der Lippe in Westfalen. Ber. Deutsch. Bot. Ges., 48: 415-419.

BUDDE, H., 1931. Die Algenflora westfälischer Salinen und Salzgewässer. 1. Teil. Arch. Hydrobiol., 23: 462-490.

BUDDE, H., 1933. Die Algenflora westfälischer Salinen und Salzgewässer. 2. Teil. Arch. Hydrobiol., 25: 305-325.

BUDDE, H., 1942. Die benthale Algenflora, die Entwicklungsgeschichte der Gewässer und die Seentypen im Naturschutzgebiet "Heiliges Meer". Arch. Hydrobiol., 39: 189-293.

CAMBURN, K.E. & R.L. LOWE, 1978. The haptobenthic diatom flora of Long Branch Creek, South Carolina. Nova Hedwigia, 30: 149-279.

CARPELAN, L.H., 1978. Evolutionary euryhalinity of diatoms in changing environments. Nova Hedwigia, 29: 489-526.

CHARLES, D.F., 1985. Relationships between surface sediment diatom assemblages and lakewater characteristics in Adirondack lakes. Ecology, 66: 994-1011.

CHOLNOKY, B.J., 1958. Hydrobiologische Untersuchungen in Transvaal 2. Selbstreinigung im Jukskei-Crocodile Flussystem. Hydrobiologia, 11: 205-266.

CHOLNOKY, B.J., 1968a. Die Ökologie der Diatomeen in Binnengewässern. J. Cramer Verlag, Vaduz.

CHOLNOKY, B.J., 1968b. Die Diatomeenassoziationen der Santa Lucia-Lagune in Natal (Südafrika). Bot. Marina, 11 Suppl.: 1-121, 4 pl.

CHOLNOKY, B.J., 1970. Hydrobiologische Untersuchungen in Transvaal 3. Die Fischteiche von Marble Hall. Bot. Marina, 13: 5-44.

CLARK, K., 1989. The distribution of *Cyclostephanos dubius* in Norfolk. Diatom Res., 4: 207-215.

CLEVE-EULER, A., 1944. Die Diatomeen als quartärgeologische Indikatoren. Geol. Fören. Förhandl., 66: 383-410.

CLEVE-EULER, A., 1951-1955. Die Diatomeen von Schweden und Finnland. Teil 1-5. Kungl. Sv. Vetenskap. Handl. 2-5. Reprint 1968, J. Cramer Verlag, Vaduz.

COLIJN, F. & K.S. DIJKEMA, 1981. Species composition of benthic diatoms and distribution of chlorophyll a on an intertidal flat in the Dutch Wadden Sea. Mar. Ecol. Progr. Ser., 4: 9-21.

COLIJN, F. & R. KOEMAN, 1975. Das Mikrophytobenthos der Watten, Strände und Riffe um den Hohen Knechtsand in der Wesermündung. Jahresber. Forschungsst. Insel- Kustenschütz Niedersächs. Wasserwirtschaftsverw., 26: 53-83.

COLIJN, F. & H. NIENHUIS, 1977. The intertidal microphytobenthos of the "Hohe Weg" shallows in the German Wadden Sea. Jahresber. Forschungsst. Insel- Küstenschütz Niedersachsen, 28: 149-174, append.

COMPERE, P., 1982. Taxonomic revision of the diatom genus *Pleurosira* (Eupodiscaceae). Bacillaria, 5: 165-190.

CONRAD, W. & H. KUFFERATH, 1954. Recherches sur les eaux saumâtres des environs de Lilloo. 2. Partie descriptive. Algues et protistes. Considérations écologiques. K.B.I.N. Verh., 127: 1-346, 14 pl.

COOK, L.L. & S.A. WHIPPLE, 1982. The distribution of edaphic diatoms along environmental gradients of a Louisiana saltmarsh. J. Phycol., 18: 64-71.

COX, E.J., 1977. The tube-dwelling diatom flora at two sites in the Severn Estuary. Bot. Marina, 20: 111-119.

CROSBY, L.H. & E.J.F. WOOD, 1959. Studies on Australian and New Zealand diatoms. 2. Normally epontic and benthic genera. Trans. Roy. Soc. New Zealand, 86: 1-58.

CZARNECKI, D.B. & D.W. BLINN, 1978. Diatoms of the Colorado River in Grand Canyon National Park and vicinity (Diatoms of the Southwestern U.S.A. 2). Bibl. Phycologia, 38: 1-181.

DE JONGE, V.N., 1985. The occurence of epipsammic diatom populations: a result of interactions between physical sorting of sediment and certain properties of diatom species. Estuar. Coast. Shelf Sci., 21: 607-622.

DESCY, J.-P., 1984. Ecologie et distribution de diatomées benthiques dans le bassin belge de la Meuse. K.B.I.N. Studiedocumenten, 18: 1-25, 70 pl.

DESIKACHARY, T.V. & V.N.R. RAO, 1972. Salinity and diatoms. J. Mar. Biol. Ass. India, 14: 524-538.

DIXIT, A.S., DIXIT, S.S. & R.D. EVANS, 1988. The relationship between sedimentary diatom assemblages and lakewater pH in 35 Quebec lakes, Canada. J. Paleolim., 1: 23-38.

DREBES, G. & M. ELBRÄCHTER, 1976. A checklist of planktonic diatoms and dinoflagellates from Helgoland and List (Sylt), German Bight. Bot. Marina, 19: 75-83.

DREBES, G. & D. SCHULZ, 1981. *Anaulus creticus* sp. nov., a new centric diatom from the Mediterranean Sea. Bacillaria, 4: 161-176.

EARLE, J.C., DUTHIE, H.C. & D.A. SCRUTON, 1986. Analysis of the phytoplankton composition of 95 Labrador lakes, with special reference to natural and anthropogenic acidification. Can. J. Fish. Aquat. Sci., 43: 1804-1811.

EDSBAGGE, H., 1968. Zur Ökologie der marinen angehefteten Diatomeen. Bot. Gothoburg., 6: 1-153, 7 pl.

EHRLICH, A., 1975. The diatoms from the surface sediments of the Bardawil Lagoon (Northern Sinai) - Palaeoecological significance. Nova Hedwigia Beih., 53: 253-277, 3 pl.

EVENSON, W.E., RUSHFORTH, S.R., BROTHERSON, J.D. & N. FUNGLADDA, 1981. The effects of selected physical and chemical factors on attached diatoms in the Uintah Basin of Utah, U.S.A.. Hydrobiologia, 83: 325-330.

FABRI, R. & L. LECLERCQ, 1984. Etude écologique des rivières du nord du massif Ardennais (Belgique): flore et végétation de diatomées et physico-chimie des eaux. 1. Contexte mésologique. Méthodes. Analyses physico-chimiques. Synthèse taxonomique, écologique et floristique. Stat. Scient. Hautes-Fagnes, Robertville.

FABRI, R. & L. LECLERCQ, 1986. Diatom communities in the rivers of Ardenne (Belgium): natural types and impact of pollution. p. 337-346. In: Ricard, M. (ed.): Proc. 8th Diatom Symp. 1984. Koeltz Scientific Books, Koenigstein.

FLORIN, M.-B., 1957. Plankton of fresh and brackish waters in the Södertälje area. Acta Phytogeogr. Suecica, 37: 3-144.

FOGED, N., 1948. Diatoms in water-courses in Funen. 6. Conclusions and general remarks. Dansk Bot. Ark., 12: 1-112.

FOGED, N., 1949. Diatoms in the salt bog of Langemose in East Funen. Dansk Bot. Ark., 13: 1-31.

FOGED, N., 1950. Diatomévegetationen i Sorte Sø, en dystrof skovsø i Syd-Fyn. Flora Fauna, 3: 3-90.

FOGED, N., 1951. The diatom flora of some Danish springs. Natura Jutlandica, 4-5: 1-84.

FOGED, N., 1954. On the diatom flora of some Funen lakes. Folia Limnol. Scand., 6: 5-75, 3 pl.

FOGED, N., 1955. Diatoms from Pearyland, North Greenland. Medd. Grønland, 128: 1-90, 14 pl.

FOGED, N., 1964. Freshwater diatoms from Spitsbergen. Tromsö Mus. Skr., 2: 1-205.

FOGED, N., 1965. En senglacial ferskvandsdiatoméflora fra Fyn. Medd. Dansk Geol. Foren., 15: 459-469.

FOGED, N., 1968a. Diatomeerne i en postglacial borepröve fra bunden af Esrom Sø, Danmark. Medd. Dansk Geol. Foren., 18: 161-180, 2 pl.

FOGED, N., 1968b. The freshwater diatom flora of the Varanger Peninsula, North Norway. Acta Borealia A. Scientia, 25: 1-64.

FOGED, N., 1970. The diatomaceous flora in a postglacial kieselguhr deposit in Southwestern Norway. Nova Hedwigia Beih., 31: 169-202.

FOGED, N., 1972. The diatoms in four postglacial deposits in Greenland. Medd. Grønland, 194: 1-66, 16 pl.

FOGED, N., 1976. Diatoms from the Alhambra, Granada, Spain. Nova Hedwigia, 27: 881-901.

FOGED, N., 1977. Freshwater diatoms in Ireland. Bibl. Phycologia, 34: 1-221.

FOGED, N., 1978. Diatoms from the Middle and Late Weichselian and the Early Flandrian period on Andøya, north Norway. Boreas, 7: 41-47.

FOGED, N., 1980. Diatoms. p 265-280. In: Warncke, E., Spring areas: ecology, vegetation and comments on similarity coefficients applied to plant communities. Holarct. Ecol., 3: 233-308.

FOGED, N., 1981. Diatoms in Alaska. Bibl. Phycologia, 53: 1-317.

FOGED, N., 1985a. Diatoms in Samos, a Greek island in the Aegean. Bibl. Diatomologica, 10: 1-119.

FOGED, N., 1985b. Diatoms in Kos and Kalymnos, two Greek islands in the Aegean. Bibl. Diatomologica, 10: 3-105.

FOGED, N., 1985c. Diatoms in a tomb from the early Bronze Age. Nova Hedwigia, 41: 471-482.

FOGED, N., 1986a. Diatoms in Gambia. Bibl. Diatomologica, 12: 1-153.

FOGED, N., 1986b. Diatoms in the Volo Bay, Greece. Bibl. Diatomologica, 12: 1-67.

FOGED, N., 1986c. Diatoms in Anholt, a Danish island in the Cattegat. Nova Hedwigia, 42: 553-589.

FOGED, N., 1987. Diatoms from Viti Levu, Fiji Islands. Bibl. Diatomologica, 14: 1-195.

FRITZ, S.C. & R.W. BATTARBEE, 1988. Sedimentary diatom assemblages in freshwater and saline lakes of the Northern Great Plains, North America: preliminary results. p. 265-271. In: Round, F.E. (ed.), Proc. 9th Diatom Symp. 1986. Koeltz. Scientific Books, Koenigstein & Biopress Ltd., Bristol.

GASSE, F., 1986. East African diatoms. Bibl. Diatomologica, 11: 1-202, 44 pl.

GASSE, F., 1987. Diatoms for reconstructing palaeoenvironments and palaeohydrology in tropical semi-arid zones. Example of some lakes from Niger since 12000 BP. Hydrobiologia, 154: 127-163.

GASSE, F. & F. TEKAIA, 1983. Transfer functions for estimating paleoecological conditions (pH) from East African diatoms. Hydrobiologia, 103: 85-90.

GERMAIN, H., 1936. Les lieux de développement et de multiplication des diatomées d'eau douce. Bull. Soc. Sci. Nat. Ouest, 5: 1-200, 16 pl.

GERMAIN, H., 1981. Flore des diatomées. Diatomophycées. Eaux douces et saumâtres du Massif armoricain et des contrées voisines d'Europe occidentale. Boubée, Paris.

GIFFEN, M.H., 1963. Contributions to the diatom flora of South Africa 1. Diatoms of the estuaries of the Eastern Cape Province. Hydrobiologia, 21: 201-265.

GIFFEN, M.H., 1967. Contributions to the diatom flora of South Africa 3. Diatoms of the marine littoral regions at Kidd's Beach near East London, Cape Province, South Africa. Nova Hedwigia, 13: 245-292, 5 pl.

GIFFEN, M.H., 1970a. Contributions to the diatom flora of South Africa 4. The marine littoral diatoms of the estuary of the Kowie River, Port Alfred, Cape Province. Nova Hedwigia Beih., 31: 259-312.

GIFFEN, M.H., 1970b. New and interesting marine and littoral diatoms from Sea Point, near Cape Town, South Africa. Bot. Marina, 13: 87-99.

GIFFEN, M.H., 1971. Marine littoral diatoms from the Gordon's Bay, region of False Bay, Cape Province, South Africa. Bot. Marina, 14: 1-16.

GIFFEN, M.H., 1973. Diatoms of the marine littoral of Steenberg's Cove in St. Helena Bay, Cape Province, South Africa. Bot. Marina, 16: 32-48.

GIFFEN, M.H., 1975. An account of the littoral diatoms from Langebaan, Saldanha Bay, Cape Province, South Africa. Bot. Marina, 18: 71-95.

GIFFEN, M.H., 1976. A further account of the marine littoral diatoms of the Saldanha Bay lagoon, Cape Province, South Africa. Bot. Marina, 19: 379-394.

GODWARD, M., 1937. An ecological and taxonomic investigation of the littoral algal flora of Lake Windermere. J. Ecol., 25: 493-568.

GOTOH, T., 1978. On the sessile diatoms in the brackish water area of the river Yodo. 1. Res. Bull. Fac. Gen. Educ. Kinki Univ., 2: 15-47.

GOTOH, T., 1986. Diatom community of the Kumano-gawa river estuary. Diatom, 2: 103-115.

GRIMES, J.A. & S.R. RUSHFORTH, 1983. Diatoms of surface sediments of Utah Lake, Utah, U.S.A.. Hydrobiologia, 99: 161-171.

GROHNE, U., 1959. Die Bedeutung der Diatomeen zum Erkennen der subfossilen Vegetation Höherer Pflanzen in Marschablagerungen. Z. Deutsch. Geol. Ges., 111: 13-28.

HÅKANSSON, H., 1986. A study of the *Discoplea* species (Bacillariophyceae) described by Ehrenberg. Diatom Res., 1: 33-56.

HÅKANSSON, H., 1988. A study of species belonging to the *Cyclotella bodanica/comta* complex (Bacillariophyceae). p. 329-354. In: Round, F.E. (ed.), Proc. 9th Diatom Symp. 1986. Koeltz Scientific Books, Koenigstein & Biopress Ltd, Bristol.

HÅKANSSON, H., 1989. Diatom succession during Middle and Late Holocene time in Lake Krageholmssjön, southern Sweden. Nova Hedwigia, 48: 143-166.

HÅKANSSON, H., 1990. A comparison of *Cyclotella krammeri* sp. nov. and *C. schumannii* Håkansson stat. nov. with similar species. Diatom Res., 5: 261-271.

HANCOCK, F.D., 1973. The ecology of the diatoms of the Klip River, southern Transvaal. Hydrobiologia, 42: 243-284.

HARTLEY, B., 1986. A check-list of the freshwater, brackish and marine diatoms of the British Isles and adjoining coastal waters. J. Mar. Biol. Ass. U.K., 66: 531-610.

HASLE, G.R., 1962. Three *Cyclotella* species from marine localities studied in the light and electron microscopes. Nova Hedwigia, 4: 299-307, 7 pl.

HASLE, G.R., 1976. The biogeography of some marine planktonic diatoms. Deep-Sea Res., 23: 319-338.

HASLE, G.R., 1979. *Thalassiosira decipiens* (Grun) Jörg. (Bacillariophyceae). Bacillaria, 2: 85-108.

HASLE, G.R., VON STOSCH, H.A. & E.E. SYVERTSEN, 1983. Cymatosiraceae, a new diatom family. Bacillaria, 6: 9-156.

HAWORTH, E.Y. & M.A. HURLEY, 1986. Comparison of the stelligeroid taxa of the centric diatom genus *Cyclotella*. p. 43-58. In: Ricard, M. (ed.), Proc. 8th Diatom Symp. 1984. Koeltz Scientific Books, Koenigstein.

HECK, H.-L. & C. BROCKMANN, 1950. Eem-Ablagerungen bei Lübeck. Schr. Naturw. Ver. Schlesw.-Holst., 24: 80-86.

HECKY, R.E. & P. KILHAM, 1973. Diatoms in alkaline, saline lakes: ecology and geochemical implications. Limnol. Oceanogr., 18: 53-71.

HENDEY, N.I., 1951. Littoral diatoms of Chichester Harbour with special reference to fouling. J. Roy. Microsc. Soc., Trans. Soc., 71: 1-86.

HENDEY, N.I., 1957. Marine diatoms from some west African ports. J. Roy. Microsc. Soc., 77: 28-85, 6 pl.

HENDEY, N.I., 1964. An introductory account of the smaller algae of British coastal waters. 5. Bacillariophyceae (Diatoms). Ministry of Agriculture, Fisheries and Food. Fishery Investigations series 4. Her Majesty's Stationery Office, London.

HENDEY, N.I., 1970. Some littoral diatoms of Kuwait. Nova Hedwigia Beih., 31: 101-167.

HENDEY, N.I., 1974. A revised check-list of British marine diatoms. J. Mar. Biol. Ass. U.K., 54: 277-300.

HENDEY, N.I., 1977. The species diversity index of some in-shore diatom communities and its use in assessing the degree of pollution insult on parts of the north coast of Cornwall. p. 355-378. In: Simonsen, R. (ed.), Proc. 4th Symp. Recent and Fossil Marine Diatoms, 1976. Nova Hedwigia Beih., 54.

HOPKINS, J.T., 1964. A study of the diatoms of the Ouse Estuary, Sussex. 2. The ecology of the mud-flat diatom flora. J. Mar. Biol. Ass. U.K., 44: 333-341.

HUBER-PESTALOZZI (unter Mitwurkung von F. Hustedt), 1942. Das Phytoplankton des Süsswassers. 2(2). Diatomeen. In: Thienemann, A. (ed.), Die Binnengewässer. Bd. 16. E. Schweizerbartsche Verlagsbuchhandlung, Stuttgart.

HUSTEDT, F., 1925. Bacillariales aus den Salzgewässern bei Oldesloe in Holstein. Mitt. Geogr. Ges. Naturhist. Mus. Lubeck, 2: 84-121.

HUSTEDT, F., 1927a. Bacillariales aus dem Aokikosee in Japan. Arch. Hydrobiol., 18: 155-172, 1 pl.

HUSTEDT, F., 1927b. Fossile Bacillariaceen aus dem Loa-Becken in der Atacama-Wüste, Chile. Arch. Hydrobiol., 18: 224-251, 3 pl.

HUSTEDT, F., 1930. Die Kieselalgen. 1. Teil. L. Rabenhorst's Kryptogamen-Flora von Deutschland, Österreich und der Schweiz, 7/1. Reprint 1977, Otto Koeltz Science Publ. Koenigstein.

HUSTEDT, F., 1931-1959. Die Kieselalgen. 2. Teil. L. Rabenhorst's Kryptogamen-Flora von Deutschland, Österreich und der Schweiz, 7/2. Reprint 1977, Otto Koeltz Science Publ., Koenigstein.

HUSTEDT, F., 1935. Die fossile Diatomeenflora in den Ablagerungen des Tobasees auf Sumatra. Arch. Hydrobiol. Suppl., 14.: 143-192, 5 pl.

HUSTEDT, F., 1938. Systematische und ökologische Untersuchungen über die Diatomeen-Flora von Java, Bali und Sumatra. 2. Die Diatomeenflora der untersuchten Gewässertypen. Arch. Hydrobiol. Suppl., 16: 1-155.

HUSTEDT, F., 1939. Die Diatomeenflora des Küstengebietes der Nordsee vom Dollart bis zur Elbemündung. 1. Die Diatomeenflora in den Sedimenten der unteren Ems sowie auf den Watten in der Leybucht, des Memmert und bei der Insel Juist. Abh. Naturw. Ver. Bremen, 31: 572-677.

HUSTEDT, F., 1942a. Süsswasser-Diatomeen des indomalayischen Archipels und der Hawaii-Inseln. Int. Rev. ges. Hydrobiol. Hydrogr., 42: 1-252.

HUSTEDT, F., 1942b. Diatomeen aus der Umgebung von Abisko in Schwedisch-Lappland. Arch. Hydrobiol., 39: 82-174.

HUSTEDT, F., 1942c. Beiträge zur Algenflora von Bremen. 5. Die Diatomeenflora einiger Sumpfwiesen bei Bremen. Abh. Naturw. Ver. Bremen, 32: 184-221.

HUSTEDT, F., 1945. Diatomeen aus Seen und Quellgebieten der Balkan-Halbinsel. Arch. Hydrobiol., 40: 867-973, 12 pl.

HUSTEDT, F., 1946. Die Diatomeenflora norddeutscher Seen mit besonderer Berücksichtigung des holsteinischen Seengebiets. 1-4. Seen in Posen, der Neumark, Pommern und der Mark Brandenburg. Arch. Hydrobiol., 41: 392-414.

HUSTEDT, F., 1950. Die Diatomeenflora norddeutscher Seen mit besonderer Berücksichtigung des holsteinischen Seengebiets. 5-7. Seen in Mecklenburg, Lauenburg und Norddeutschland. Arch. Hydrobiol., 43: 329-458, 7 pl.

HUSTEDT, F., 1953. Diatomeen aus der Oase Gafsa in Südtunesien. Arch. Hydrobiol., 48: 145-153.

HUSTEDT, F., 1955. Marine littoral diatoms of Beaufort, North Carolina. Bull. Duke Univ. Marine Station, 6: 1-67.

HUSTEDT, F., 1957. Die Diatomeenflora des Flusssystems der Weser im Gebiet der Hansestadt Bremen. Abh. Naturw. Ver. Bremen, 34: 181-440.

HUSTEDT, F., 1959. Die Diatomeenflora der Unterweser von der Lesummündung bis Bremerhaven mit Berücksichtigung des Unterlaufs der Hunte und Geeste. Veröff. Inst. Meeresforsch. Bremerhaven, 6: 13-176.

HUSTEDT, F. & A.A. ALEEM, 1951. Littoral diatoms from the Salstone, near Plymouth. J. Mar. Biol. Ass. U.K., 30: 177-196.

JACKSON, R.H., WILLIAMS, P.J. & I.R. JOINT, 1987. Freshwater phytoplankton in the low salinity region of the River Tamar estuary. Est. Coast. Shelf Sci., 25: 299-311.

JOHN, J., 1983. The diatom flora of the Swan River Estuary, Western Australia. Bibl. Phycologia, 64: 1-359.

JØRGENSEN, E.G., 1948. Diatom communities in some Danish lakes and ponds. Kong. Danske Vidensk. Selsk. Biol. Skr., 5: 1-117, 3 pl.

JUGGINS, S., 1988. A diatom/salinity transfer function for the Thames Estuary and its application to waterfront archaeology. Unpub. Ph. D. Thesis, Univ. London.

KALBE, L., 1963. Die Diatomeenflora einer mecklenburgischer Salzwiese. Wiss. Z. Univ. Rostock Math.-Naturw. Reihe, 12: 91-97.

KALBE, L., 1973. Kieselalgen in Binnengewässern. A. Ziemsen Verlag, Wittenberg.

KILHAM, P., KILHAM, S.S. & R.E. HECKY, 1986. Hypothesized resource relationships among African planktonic diatoms. Limnol. Oceanogr., 31: 1169-1181.

KOLBE, R.W., 1927. Zür Ökologie, Morphologie und Systematik der Brackwasser-Diatomeen. Pflanzenforschung, 7: 1-145, 3 pl.

KOLBE, R.W., 1932. Grundlinien einer allgemeinen Ökologie der Diatomeen. Ergebn. Biologie, 8: 221-348.

KOLBE, R.W. & E. TIEGS, 1929. Zur mesohaloben Diatomeenflora des Werragebietes. Ber. Deutsch. Bot. Ges., 47: 408-420, 1 pl.

KÖNIG, D., 1959. Diatomeen der Bucht von Arcachon (Dép. Gironde, Frankreich). Z. Deutsch. Geol. Ges., 111: 33-61, 3 pl.

KÖNIG, D., 1974. Subfossil diatoms in a former tidal region of the Eider (Schleswig-Holstein). Nova Hedwigia Beih., 45: 259-274, 4 pl.

KÖNIG, D., 1983. Diatomeen des frühneolithischen Fundplatzes Siggeneben-Süd. p. 124-136, 4 pl. In: Meurers-Balke, J., Siggeneben-Süd. Ein Fundplatz der frühen Tricherbeckerkultur an der holsteinischen Ostseeküste. Offa-Bücher, Band 50. Karl Wachholtz Verlag, Neumünster.

KOPPEN, J.D. & J.H. CROW, 1978. Some midsummer diatom assemblages along the saline gradient of a small coastal stream in Kachemak Bay, Alaska. Bot. Marina, 21: 199-206.

KÖRBER-GROHNE, U., 1967. Geobotanische Untersuchungen auf der Feddersen Wierde. Franz Steiner Verlag, Wiesbaden.

KRAMMER, K. & H. LANGE-BERTALOT, 1986. Bacillariophyceae. 1. Naviculaceae. Süszwasserflora von Mitteleuropa 2/1. Gustav Fischer Verlag, Stuttgart - New York.

KRASSKE, G., 1932. Beiträge zur Kenntnis der Diatomeenflora der Alpen. Hedwigia, 72: 92-134.

KRASSKE, G., 1938. Beiträge zur Kenntnis der Diatomeen-Vegetation von Island und Spitzbergen. Arch. Hydrobiol., 33: 503-533, 1 pl.

KRASSKE, G., 1948. Diatomeen tropischer Moosrasen. Sv. Bot. Tidsskr., 42: 404-443.

LANGE-BERTALOT, H., 1978. Diatomeen-Differentialarten anstelle von Leitformen: ein geigneteres Kriterium der Gewässerbelastung. Arch. Hydrobiol. Suppl., 51: 393-427.

LANGE-BERTALOT, H., 1979. Toleranzgrenzen und Populationsdynamik benthischer Diatomeen bei unterschiedlich starker Abwasserbelastung. Arch. Hydrobiol. Suppl., 56: 184-219.

LECLERCQ, L., 1984. Etude écologique des rivières du nord du massif Ardennais (Belgique): flore et végétation de diatomées et physico-chimie des eaux. 2. Typologie des milieux naturels. Stat. Scient. Hautes-Fagnes, Robertville.

LOUIS, A. & F. PEETERS, 1967. Observations écologiques et floristiques sur la florule algale du nord de la Campine belge. Bull. Jard. Bot. Nat. Belg., 37: 357-443.

MAHOOD, A.D., FRYXELL, G.A. & M. McMILLAN, 1986. The diatom genus *Thalassiosira*: species from the San Francisco Bay system. Proc. Calif. Acad. Sci., 44: 127-156.

MAILLARD, R., 1977. Diatomées d'eau douce du Mali, Afrique. Bull. Mus. Nation. Hist. Nat. 443: 17-45.

MAIN, S.P. & C.D. McINTIRE, 1974. The distribution of epiphytic diatoms in Yaquina Estuary, Oregon (U.S.A.). Bot. Marina, 17: 88-99.

MARGALEF, R., 1956. Paleoecologia postglacial de la Ria de Vigo. Invest. Pesq., 5: 89-112.

McINTIRE, C.D., 1978. The distribution of estuarine diatoms along environmental gradients: a canonical correlation. Estuar. Coast. Mar. Sci., 6: 447-457.

McINTIRE, C.D. & W.S. OVERTON, 1971. Distributional patterns in assemblages of attached diatoms from Yaquina Estuary, Oregon. Ecology, 52: 759-777.

MÖLDER, K., 1943a. Studiën über die Ökologie und Geologie der Bodendiatomeen in der Pojo-Bucht. Ann. Bot. Soc. Zool.-Bot. Fenn. Vanamo, 18: 1-204.

MÖLDER, K., 1943b. Rezente Diatomeen in Finnland als Grundlage quartärgeologischer Untersuchungen. Geol. Meere Binnengewässer, 6: 148-240.

MÖLDER, K., 1962. Über die Diatomeenflora des Bottnischen Meerbusens und der Ostsee. Merentutkimuslait. Julk., 203: 1-58.

MÖLDER, K. & R. TYNNI, 1967. Über Finnlands rezente und subfossile Diatomeen 1. Compt. Rend. Soc. Géol. Finlande, 39: 199-217.

MÖLDER, K. & R. TYNNI, 1968. Über Finnlands rezente und subfossile Diatomeen 2. Bull. Geol. Soc. Finland, 40: 151-170.

MÖLLER, B. & H. PANKOW, 1981. Algensoziologische und saprobiologische Untersuchungen an Vorflutern der Elbe. Limnologica, 13: 291-350.

MØLLER, M., 1950. The diatoms of Praestø Fjord. Folia Geogr. Danica, 3: 187-237.

MOORE, J.W., 1975. Benthic algae of southern Baffin Island. 4. Annotated list of Bacillariophyta. Nova Hedwigia, 26: 205-224.

MOREIRA FILHO, M. & I.M. VALENTE MOREIRA, 1984. Catalogue of marine and estuarine diatoms (Chrysophyta - Bacillariophyceae) in Paranha State, Brazil. Acta Biol. Par., 13: 3-49.

MUNDA, J., 1967. Changes in the algal vegetation of a part of the deltaic area in the Southern Netherlands (Veerse Meer) after its closure. Bot. Marina, 10: 141-157.

NAVARRO, J.N., 1981a. A survey of the marine diatoms of Puerto Rico. 1. Suborders Coscinodiscaceae and Rhizosoleniineae. Bot. Marina, 24: 427-439.

NAVARRO, J.N., 1981b. A survey of the marine diatoms of Puerto Rico. 2. Suborder Biddulphiineae: families Biddulphiaceae, Lithodesmiaceae and Eupodiscaceae. Bot. Marina, 24: 615-630.

NAVARRO, N.J., 1982. Marine diatoms associated with mangrove prop roots in the Indian River, Florida, U.S.A. Bibl. Phycologia, 61: 1-151.

NIESSEN, H., 1956. Ökologische Untersuchungen über die Diatomeen und Desmidiaceen des Murnauer Moores. Arch. Hydrobiol., 51: 281-375.

PANKOW, H., 1976. Algenflora der Ostsee. 2. Plankton (einschl. benthischer Kieselalgen). Gustav Fisher Verlag, Stuttgart.

PANKOW, H. & F.M. MUTLEG, 1982. On the microalgae flora of the Gulf of Aden near Aden (People's Democratic Republic of Yemen). Nova Hedwigia, 36: 399-408.

PATRICK, R. & C.W. REIMER, 1966. The diatoms of the United States (excl. of Alaska and Hawaii). 1. Monogr. Acad. Nat. Sci. Philad., 13: 1-688.

PETERSEN, J.B., 1943. Some halobion spectra (Diatoms). Kong. Danske Vidensk. Selsk. Biol. Medd., 17: 1-95.

PIERRE, J.F., 1969. Sur quelques Cyclotelles a contour elliptique. Rev. Algol., 9: 294-296.

PODELLECK, R. & H. PANKOW, 1986. Saprobiologische Untersuchungen der Kleinalgenflora in einem Brackgewässer (Darsz-Zingster Boddenkette). Acta Hydrochim. Hydrobiol., 14: 135-151.

RAMM, G., 1977. Structure of epiphytic diatom populations of the phytal of the Kiel Bight (western Baltic). Nova Hedwigia Beih., 54: 379-387.

RAO, V.N.R. & J. LEWIN, 1976. Benthic marine diatom flora of False Bay, San Juan Island, Washington. Syesis, 9: 173-213.

RAUTIAINEN, H. & O. RAVANKO, 1972. The epiphytic diatom flora of the benthic macrophyte communities on rocky shores in the Southwestern Archipelago of Finland, Seili Islands. Nova Hedwigia, 23: 827-842.

RICARD, M., 1977. Les peuplements de diatomées des lagons de l'Archipel de la Sociéte (Polynésie Française). Rev. Algol., 12: 137-336.

RICARD, M., 1987. Atlas du phytoplancton marin. 2. Diatomophycées. Edit. C. N. R. S., Paris.

RIVERA, P., 1981. Beiträge zur Taxonomie und Verbreitung der Gattung *Thalassiosira* Cleve (Bacillariophyceae) in den Küstengewässern Chiles. Bibl. Phycologia, 56: 1-225, 71 pl.

RIZNYK, R.Z., 1973. Interstitial diatoms from two tidal flats in Yaquina Estuary, Oregon, U.S.A. Bot. Marina, 16: 113-138.

ROSS, R. & P.A. SIMS, 1971. Generic limits in the Biddulphiaceae as indicated by the scanning electron microscope. p. 155-177. In: Heywood, V.H. (ed.), Scanning electron microscopy. Systematic and evolutionary applications. Academic Press, London - New York.

ROUND, F.E., 1957. A note on some diatom communities in calcareous springs and streams. J. Linn. Soc., Bot., 55: 662-668.

ROUND, F.E., 1960. The epipelic algal flora of some Finnish lakes. Arch. Hydrobiol., 57: 161-178.

ROUND, F.E., 1964. The diatom sequence in lake deposits: some problems of interpretation. Verh. Int. Ver. Limnol., 15: 1012-1020.

ROUND, F.E., 1971. Benthic marine diatoms. Oceanogr. Mar. Biol. Annual Rev., 9: 83-139.

ROUND, F.E. & D.G. MANN, 1980. *Psammodiscus* nov. gen. based on *Coscinodiscus nitidus*. Ann. Bot., 46: 367-373.

SALAH, M.M., 1952. Diatoms from Blakeney Point, Norfolk. New species and new records for Great Britain. J. Roy. Microsc. Soc., 72: 155-169.

SALAH, M.M., 1955. Some new diatoms from Blakeney Point. Hydrobiologia, 7: 88-102.

SALDEN, N., 1978. Beiträge zur Ökologie der Diatomeen (Bacillariophyceae) des Süsswassers. Decheniana Beih., 22: 1-238.

SCHEELE, M., 1952. Systematisch-ökologische Untersuchungen über die Diatomeenflora der Fulda. Arch. Hydrobiol., 44: 305-423.

SCHEELE, M., 1956. Verbreitung und Ökologie der Kieselalgen der Werra mit besonderer Berücksichtigung der Halophyten. Arch. Hydrobiol., 51: 425-456.

SCHIMANSKY, H., 1973. Beitrag zur Diatomeenflora von Erlangen. Nova Hedwigia, 24: 237-335.

SCHULZ, P., 1928. Süss- und Brackwasserdiatomeen aus dem Gebiete der Freien Stadt Danzig und dem benachbarten Pommerellen. Ber. Westpreuss. Bot.-Zool. Ver., 50: 85-200.

SHAFFER, G.P. & M.J. SULLIVAN, 1988. Water column productivity attributable to displaced benthic diatoms in well-mixed shallow estuaries. J. Phycol., 24: 132-140.

SHEAR, H., NALEWAJKO, C. & H.M. BACCHUS, 1976. Some aspects of the ecology of *Melosira* spp. in Ontario lakes. Hydrobiologia, 50: 173-176.

SIMONSEN, R., 1959. Neue Diatomeen aus der Ostsee 1. Kieler Meeresforsch., 15: 74-83.

SIMONSEN, R., 1962. Untersuchungen zur Systematik und Ökologie der Bodendiatomeen der westlichen Ostsee. Int. Rev. ges. Hydrobiol. Syst. Beih., 1: 8-144, 4 pl.

SIMS, P.-A., 1978. Freshwater diatoms. p. 17.1-17.33. in: Jermy, A.C. & J.A. Crabbe (eds), The island of Mull. A survey of its flora and environment. British Museum (Natural History), London.

SLADECEK, V., 1973. System of water quality from the biological point of view. Arch. Hydrobiol. Beih. Ergebn. Limnol., 7: 1-128.

SMAYDA, T.J., 1958. Biogeographical studies of marine phytoplankton. Oikos, 9: 158-191.

SNOEIJS, P.J.M., 1989. Ecological effects of cooling water discharge on hydrolittoral epilithic diatom communities in the Northern Baltic Sea. Diatom Res., 4: 373-398.

ST. CLAIR, L.L., RUSHFORTH, S.R. & J.V. ALLEN, 1981. Diatoms of Oregon Caves National Monument, Oregon. Great Basin Naturalist, 41: 317-332.

STOWE, W.C., 1982. Diatoms epiphytic on the emergent grass *Spartina alternifolia* in a Louisiana saltmarsh. Trans. Am. Microsc. Soc., 101: 162-173.

SULLIVAN, M.J., 1975. Diatom communities from a Delaware saltmarsh. J. Phycol., 11: 384-390.

SULLIVAN, M.J., 1977. Edaphic diatom communities associated with *Spartina alterniflora* and *S. patens* in New Jersey. Hydrobiologia, 52: 207-211.

SULLIVAN, M.J., 1978. Diatom community structure: taxonomic and statistical analyses of a Mississippi salt marsh. J. Phycol., 14: 468-475.

SYMOENS, J.-J., 1957. Les eaux douces de l'Ardenne et des régions voisines: les milieux et leur végétation algale. Bull. Soc. Roy. Bot. Belg., 89: 111-314, 7 pl.

TANAKA, N., OHWADA, K., SUGIYAMA, M., ASAKAWA, A., JIKURA, T. & S. KITAMURA, 1984. Seasonal occurences of epiphytic microalgae on the natural seaweeds and artificial seagrasses in Ago Bay. Bull. Jap. Soc. Sci. Fish., 50: 1665-1669.

TAYLOR, M.C., DUTHIE, H.C. & S.M. SMITH, 1987. Distribution of the genus *Cyclotella* in relation to pH in Precambian Shield lakes: implications for diatom-inferred pH. J. Phycol., 23: 673-676.

TERHO, A., 1982. Recent diatoms of some raised bogs in southwestern Finland. Publ. Dept. Quat. Geol., Univ. Turku.

TUCHMAN, M.L., THERIOT, E. & E.F. STOERMER, 1984. Effects of low level salinity concentrations on the growth of *Cyclotella meneghiniana* Kütz. (Bacillariophyta). Arch. Protistenk., 128: 319-326.

TYNNI, R., 1980. Über Finnlands rezente und subfossile Diatomeen, 11. Bull. Geol. Surv. Finland, 312: 1-93.

UHERKOVICH, G., 1970. Beiträge zur Kenntnis des Phytoplanktons von Helgoland. Bot. Marina, 13: 50-56.

VALENTE MOREIRA, I.M. & H. MOREIRA FILHO, 1982. Contribution to the study of Bacillariophyceae (diatoms) in Caioba, Parana State, Brazil. Acta Biol. Par., 10-11: 157-197.

VAN DEN HOEK, C., ADMIRAAL, W., COLIJN, F. & V.N. DE JONGE, 1979. The role of algae and seagrasses in the ecosystem of the Wadden Sea: a review. p. 9-118, 172-198. In: Wolff, W.J. (ed.), Flora and vegetation of the Wadden Sea. Report 3 Wadden Sea Working Group, Texel.

VAN DER WERFF, A., 1954. Resultate der Untersuchungen auf Diatomeen. In: Zwillenberg, L.O. & J. Hendriks, Zum Vorkommen von *Cardium*klei im Waterland nordöstlich von Amsterdam. Geol. Mijnbouw, 16: 105-117.

VAN DER WERFF, A., 1960. Die Diatomeen des Dollart-Emsgebietes. Verh. Kon. Ned. Geol. Mijnb. Gen., Geol. Serie, 19: 153-201.

VAN DER WERFF, A. & H. HULS, 1957-1974. Diatomeeënflora van Nederland. Reprint 1976, Otto Koeltz Science Publ., Koenigstein.

VAN HEURCK, H., 1880-1885. Synopsis des diatomées de Belgique. Atlas. Ducaju & Co., Anvers.

VAN MEEL, L., 1965. La flore et la faune du bassin de chasse d'Ostende (1938-1962). 2. Etude écologique et planctonique. Verh. K.B.I.N., 154: 36-189.

VON DER BRELIE, G., 1956. Diatomeen als Fazies-fossilien. Geol. Rundschau, 45: 84-97.

VON STOSCH, H.A., 1956. Die zentrischen Grunddiatomeen. Beiträge zur Floristik und Ökologie einer Pflanzengesellschaft der Nordsee. Helgoländer Wiss. Meeresunters., 5: 273-291.

VON STOSCH, H.A., 1980. The two *Lithodesmium* species (Centrales) of European waters. Bacillaria, 3: 7-20.

VOS, P.C., 1986. De sediment stabiliserende werking van benthische diatomeeën in het intergetijde gebied van de Oosterschelde. Inst. Aardwetenschappen, Utrecht, Publ. 63. & Rijkswaterstaat, Dienst Getijdewateren, Middelburg, GEOMOR nota 86-3.

VOS, P.C. & H. DE WOLF, 1988. Methodological aspects of paleoecological diatom research in coastal areas of the Netherlands. Geol. Mijnbouw, 67: 31-40.

WHITING, M.C. & C.D. McINTIRE, 1985. An investigation of distributional patterns in the diatom flora of Netarts Bay, Oregon, by correspondence analysis. J. Phycol., 21: 655-661.

WILDERMAN, C.C., 1986. Techniques and results of an investigation into the autecology of some major species of diatoms from the Severn River Estuary, Chesapeake Bay, Maryland, U.S.A. p. 631-643. In: Ricard, M. (ed.), Proc. 8th. Diatom Symp. 1984. Koeltz Scientific Books, Koenigstein.

WILDERMAN, C.C., 1987. Patterns of distribution of diatom assemblages along environmental gradients in the Severn River Estuary, Chesapeake Bay, Maryland. J. Phycol., 23: 209-217.

WOOD, E.J.F., 1964. Studies in microbial ecology of the Australasian region. 5. Microbiology of some Australian estuaries. 6. Ecological relations of Australian estuarine diatoms. Nova Hedwigia, 8: 461-548.

ZELINKA, M. & P. MARVAN, 1961. Zur Präzisierung der biologischen Klassifikation der Reinheit fliessender Gewässer. Arch. Hydrobiol., 57: 389-407.

ZIEMANN, M., 1970. Zur Gültigkeit des Saprobiensystems in versaltzten Binnengewässern. Limnologica, 7: 279-293.

3. INDEX OF ENTRIES