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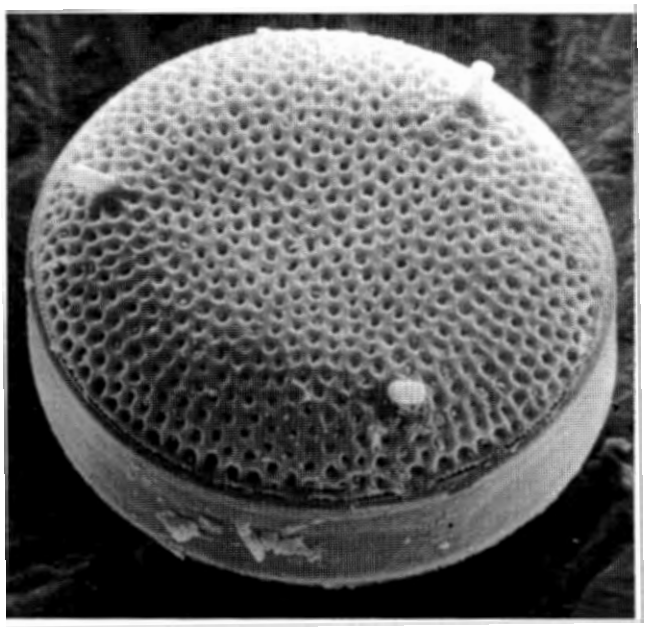
MINISTERIE VAN ECONOMISCHE ZAKEN

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



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by
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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.** (Möller, 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; Møller, 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; Møller, 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; Møller, 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; Møller, 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; Møller, 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; Möller, 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**

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