Proceedings of the 1st Central European Diatom Meeting 2007
Kusber, W.-H. & Jahn, R. (ed.)
Botanic Garden and Botanical Museum Berlin-Dahlem, Freie Universität Berlin
ISBN 978-3-921800-63-8, © BGBM, Berlin 2007.
doi:10.3372/cediatom.133 (available via http://dx.doi.org/)

Studies on diatoms of inland waters and of the southern Baltic Sea in Mecklenburg-Western Pomerania (Germany) since the middle of the last century

Lothar Täuscher

Institute for Applied Freshwater Ecology Corp., Schlunkendorfer Str. 2e, 14554 Seddiner See, Germany; lothar.taeuscher@iag-gmbh.info

In the state Mecklenburg-Western Pomerania in Northeast Germany numerous water bodies with different ecological conditions are characteristic: deep stratified lakes, shallow lakes, riverine lakes, small natural or artificial water bodies, large slowly flowing rivers and their tributaries (River Elbe, River Elde, River Peene, River Ucker, River Warnow), small running waters and ditches, coastal waters (brackish waters with different salinity: shallow coastal inlets "Bodden", River Odra Estuary or Odra Bay, River Warnow Estuary) and the southern part of the Baltic Sea.

The planktic, tychoplanktic and benthic diatom communities of these waters in regard to different aspects incl. paleolimnology were investigated by phycologists at the University of Greifswald [K.-A. Wegener], University of Rostock [H. Pankow (Pankow 1976, 1990) and his students or colleagues G. Berg respectively G. Gerstädt, R. Börner, T. Hübener, L. Kalbe (Kalbe 1973), V. Kell, U. Lenschow, B. Martens respectively B. Zander, B. Möller, S. Nasev respectively S. Riesenweber, R. Podelleck (see Karsten 2001, Täuscher 2000)], Institute for Marine Research respectively Baltic Sea Research Institute Warnemünde [N. Wasmund], and Water Management Board ("Wasserwirtschaftsdirektion") Stralsund [I. Schmidt].

Greifswald Group:

Small running waters and ditches ("Beek", "Ryck", "Ziese"); shallow coastal waters / inlets ("Greifswalder Bodden"); estuary of the River Warnow ("Unterwarnow"); Odra estuary and Odra Bay ("Oderbucht").

Rostock Group:

Inland waters (different lakes and running waters); shallow coastal waters / inlets ("Darß-Zingster Boddenkette", "Greifswalder Bodden"); estuary of the River Warnow ("Unterwarnow"); southern Baltic Sea.

In Table 1 the number of diatom taxa in different waters in Mecklenburg-Western Pomerania are listed. It is noteworthy that 53 to 80 % of the microalgae in these studies on the planktic or benthic algal communtities are diatoms.

Diatom syntaxa were described and used for bioindication of the water quality by these phycologists: T. Hübener, B. Möller, H. Pankow, R. Podelleck, L. Täuscher and K.-A. Wegener (see Table 2).

Table 1. Number of diatom taxa in different waters in the state Mecklenburg-Western Pomerania (Northeast Germany).
Taxa counted: species, subspecies,varieties, formae; P = planktic.

Site	References according to Täuscher (2005)	Diatom taxa
Ditches Beek and Ziese	Wegener & Trippler 1984	294
Shallow coastal waters "Darß-Zingster Bodden"	Kell, Martens, Pankow & Riesenweber 1975	257 = 59 % (434 micro algae)
River Elbe tributaries	Möller 1977, Möller & Pankow 1981	201 = 80 % (249 micro algae)
River Elde	Möller & Pankow 1973	141 = 72 % (195 micro algae)
Shallow coastal waters "Greifswalder Bodden"	Kell 1985, 1986, 1989,	128 (P) = 57 % (223 micro algae)
	Wegener, Trippler & Leipe 1989	315
Lake Kummerower See	Kalbe & Werner 1974	279
River Peene	Pankow 1965	135
River Recknitz	Gerstädt 1986, Berg 1988	160 = 69 % (232 micro algae)
River Ryck	Wegener & Trippler 1985	194
Lake Schaalsee	Etzrodt 1965, Pankow & Etzrodt 1965	96 = 62 % (154 micro algae)
Southern Baltic Sea	Kell 1972	224 (P) = 67 % (332 microalgae)
	Wasmund et al. 2006	52 (P) = 38 % (138 micro algae)
River Warnow: upper River Warnow and tributaries	Kalbe 1963	235 = 57 % (410 micro algae)
	Hübener 1987	229 = 54 % (423 micro algae)
River Warnow: lower River Warnow = River Warnow estuary	Jerjour 1989, Jerjour, Pankow & Kell 1990, Schmidt 1990	126 = 54 % (232 micro algae) 100 (P) = 53 % (190 micro algae)

Table 2. Diatom syntaxa and their use for bioindication of the water quality (according to Täuscher 1998, 2005).
Abbreviations: A = association / assemblage; B = benthic; bm = beta-mesosaprobic; eutr. = eutrophic; haph = halophilic; K = class; mtr. = mesotrophic; O = order; P = planktic; p.p. = pro parte; o = oligosaprobic; polytr. = polytrophic; SubA = sub-association / sub-assemblage; V = alliance.

	Planktic diatom assemblages
K	**Asterionelletea** Täuscher 1980
O	**Asterionelletalia** Täuscher 1980
V	**Asterionellion** B. Möller et Pankow 1980 (ms.), 1981 emend. Täuscher 1980
A	**Aulacoseiretum granulatae** Täuscher 1980 corr. 1995
SubA	**typicum**
SubA	**diatometosum tenuis** Täuscher 1996
	synecology: eutr.-polytr., bm, P, p.p. haph
A	**Fragilario crotonensis - Asterionelletum formosae** (Messikommer 1927) B. Möller 1977
	synecology: mtr.-eutr., o-bm, P

Table 2. Continued.

	Benthic diatom assemblages
K	**Naviculetea** Pankow 1980 emend. Täuscher 1997
O	**Naviculetalia** Pankow 1980
V	**Meridio - Naviculion gregariae** M. Schlüter 1961
A	**Achnantho lanceolatae - Meridietum circularis** (Budde 1928) B. Möller 1977
	synecology: mtr.-eutr., o-bm, B
A	**Cocconeidetum placentulae** B. Möller 1977
SubA	**typicum**
SubA	**diatometosum vulgaris** B. Möller 1977
SubA	**fragilarietosum ulnae** B. Möller 1977 corr. Täuscher 1998
SubA	**melosiretosum lineatae** Pankow 1980 corr. Täuscher 1998
SubA	**ulvelletosum frequentis** (Butcher 1940) Täuscher 1998
	synecology: eutr., (o)-bm, B, p.p.. haph
A	**Diatomo tenuis - Fragilarietum pulchellae** (Budde 1930) Pankow 1980 corr. Täuscher 1998
	synecology: eutr., bm, B, haph
A	**Melosiretum lineatae** Pankow 1980 corr. Täuscher 1998
	synecology: eutr., bm, B, haph
A	**Melosiretum variantis** Budde 1930
SubA	**typicum**
SubA	**gomphonemetosum** (Budde 1928) Täuscher*, nov. subass.
	synecology: eutr., bm, B
A	**Naviculetum cryptocephalo - venetae** (Budde 1932) Pankow 1980 corr. Täuscher 1998
	synecology: polytr., bm-am, B, halophilic
A	**Naviculetum rhynchocephalo - lanceolatae** M. Schlüter 1961 corr. Hübener 1987
	synecology: eutr.-polytr., bm-bm/am-am, B
A	**Naviculo salinarum - Amphoretum coffeaeformis** Budde 1932
	synecology: eutr., bm, B, haph

* In Täuscher (1994) as *"Gomphonema*-Variante".

In respect to the European Water Framework Directive benthic diatoms as biological indicators for the ecological status of lakes were investigated by G. Hofmann. Studies on the phytoplankton quality and quantity (incl. diatoms) of more than 550 small water bodies, lakes and running waters by the Institute for Applied Freshwater Ecology Corp. Seddiner See [A. Danowski, L. Täuscher] are the basis for databases and reports of the Lake Project in Mecklenburg-Western Pomerania [J. Mathes] and of the Office for Environment, Nature Conservation and Geology ("Landesamt für Umwelt, Naturschutz und Geologie – LUNG" publishing the "Water Quality Report Mecklenburg-Western Pomerania – Gewässergütebericht M-V").

In the second part of the 20th century more than 100 papers and diploma theses or dissertations on diatoms in waters of Mecklenburg-Western Pomerania (Bibliography: 370 publications and diploma theses or dissertations about algae, see Täuscher 2005) and numerous reports and studies (unpublished "grey literature") about these microalgae were published. This literature is an important basis for the use of benthic and planktic diatoms in the classification of the ecological status of waters according to the European Water Framework Directive and the definition of references for standing, running and coastal waters.

ACKNOWLEDGEMENT

I would like to thank my daughter Henrike Täuscher for correcting my English.

REFERENCES

Budde, H. 1928: Die Algenflora des Sauerländischen Gebirgsbaches. – Archiv für Hydrobiologie **19:** 433-520.

Kalbe, L. 1973: Kieselalgen in Binnengewässern. – Wittenberg Lutherstadt.

Karsten, U. 2001: Phykologische Forschung in Rostock. – Rundschreiben Sektion Phykologie in der Deutschen Botanischen Gesellschaft **Dezember 2001:** 3.

Pankow, H. 1976: Algenflora der Ostsee. II. Plankton (einschl. bentischer Kieselalgen). – Jena.

Pankow, H. 1990: Ostsee-Algenflora. – Jena.

Täuscher, L. 1994: Hydrobotanische und ökologische Untersuchungen an und in Gewässern des nördlichen Elb-Havel-Winkels I. Untertrübengraben und Rahnsee (Wulkauer See). – Untere Havel - Naturkundliche Berichte (Havelberg) **3:** 4-13.

Täuscher, L. 1998: Mikroalgengesellschaften der Gewässer Nordostdeutschlands und ihre Nutzung zur Bioindikation. – Feddes Repertorium **109:** 617-638.

Täuscher, L. 2000: Der Beitrag von Helmut Pankow (1929-1996) für die botanische Erforschung Mecklenburg-Vorpommerns (incl. Verzeichnis der Taxa- und Syntaxa-Neubeschreibungen, -Neukombinationen und Emendierungen, hydrobotanisch-ökologischer Arbeiten, Arbeiten zur Pflanzenanatomie, Gefäßpflanzen- und Moosflora Mecklenburgs und Bücher und Buchbeiträge). – Pp. 1038-1046 in: Deutsche Gesellschaft für Limnologie (ed.): Tagungsbericht 1999 (Rostock). – Tutzing.

Täuscher, L. 2005: 50 Jahre Erforschung der Algen-Besiedlung von Gewässern in Mecklenburg-Vorpommern – ein bibliographischer Überblick. – Archiv der Freunde der Naturgeschichte in Mecklenburg **44:** 183-206.