The last chapter of the Discoplea story

Wolf-Henning KUSBER* & Regine JAHN

Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin, Königin-Luise-Str. 6-8, 14195 Berlin, Germany
*Corresponding author e-mail: w.h.kusber@bgbm.org

SUMMARY - The last chapter of the Discoplea story - The name Discoplea was introduced by C.G. Ehrenberg in 1840 as a new genus within the centric diatoms (Bacillariophyta). In the 1980s, almost all species of the genus Discoplea housed in the Ehrenberg Collection were studied by H. Håkansson. But in 2003, P. Silva published a comprehensive paper on the nomenclature of the genus Discoplea declaring it as invalidly published. He also included a list of later validations of individual species names. This list includes Discoplea kuetzingii and Discoplea sorrentina which for different reasons were neither checked by H. Håkansson nor by P. Silva. Material of these species was retrieved in the Ehrenberg Collection and is here evaluated and illustrated for the first time. The specimens are discussed with respect to their taxonomical and nomenclatural relevance. In addition, the original material of Ehrenberg’s Discoplea comta, validated as Cyclotella comta by F.T. Kützing, was re-evaluated in order to understand the type of Cyclotella comta which is published as conserved with Grunow’s slide in the International Code of Botanical Nomenclature. Consequently, Discoplea comta is here epitypified with Ehrenberg’s material.


Key words: Discoplea, Cyclotella, Bacillariophyta, nomenclature, typification
Parole chiave: Discoplea, Cyclotella, Bacillariophyta, nomenclatura, tipizzazione

1. INTRODUCTION

Discoplea Ehrenb. was established as a new genus in 1840 including two species, D. graeca Ehrenb., currently known as Puncticula graeca (Kütz.) Håkansson and D. kuetzingii (as “Kützingii”). Håkansson (1986) revised all available original material of the genus Discoplea Ehrenb. and summarized her work in a later paper on centric diatoms (Håkansson 2002). Silva (2003) described the nomenclatural history of the genus Discoplea Ehrenb. in detail, and therefore all nomenclatural and taxonomical problems seem to be solved. However, the taxonomic evaluation of Ehrenberg’s Discoplea kuetzingii and D. sorrentina are still outstanding. Håkansson (1986) was not able to check the identity of Discoplea kuetzingii because the questionable preparation was not available.

at the Ehrenberg Collection in Berlin prior to 1995 (see Lazarus & Jahn 1998). Later the availability of original material was not checked again (Håkansson 2002), and the material was cited as missing (Silva 2003).

In this paper, the voucher specimen of Discoplea kuetzingii is shown for the first time and its priority in respect to Cyclotella meneghiniana is discussed. The conserved type of Cyclotella comta Kütz. (invalidly described as Discoplea comta Ehrenb.) is also discussed. The aim of this study is to complete our knowledge of Ehrenberg’s invalidly published but intensively discussed genus.

2. MATERIAL AND METHODS

The Ehrenberg Collection in Berlin (BHUPM) was checked for original material. Photographs were taken with an Olympus DP 50 and BX 51 with an Olympus 80x IC 80/0.75. More details about the work in the Ehrenberg collection have been published in Jahn & Kusber (2004).

3. RESULTS


Comment: An explicit generic description is missing in Ehrenberg (1840), but both species descriptions include partly the same wording: “testula disciformi in lateribus planis”. This is neither a differential diagnosis nor a description, characterizing a single genus. The wording is applicable to a number of centric genera. Hence there is, in respect to Silva (2003) no new argument to validate the genus.


Ind. loc.: “Berolinii. In Gelatinæ nidulatur socialis.” [Berlin, Germany].

Voucher specimen: BHUPM 540067-6. (Trockenpräparate II Polygastrica No. LXVII: 6).

Further original material: drawing sheet no. 478 in BHUPM, reproduced as plate 1A.

Description by Ehrenberg (1840): “minor testula disciformi in lateribus planis margine solum radiatim striata. Diam. 1/288 - 1/96”. The minimum size of 7.8 µm refers to another centric diatom which was too small to see any details for Ehrenberg. The maximum size of 23.5 µm is close to our measurements.

The left part of Ehrenberg’s drawing sheet No. 478 in BHUPM has the date “22. Sept. 1837” and further information “in Lemna zum Naide papillosa”. In the “Taxonomic Index” in the Ehrenberg Collection there is only one mica sub “Discoplea” with neither an epitheton, nor a locality. This preparation was identified as being the basis for Ehrenberg’s drawing from living material from Lemna periphyton (Pl. 1B). Valves from this preparation are depicted in plate 1B-F.

From the images of Ehrenberg’s preparation and the measurements, we assume that Ehrenberg described a species from a living periphyton sample from Berlin, Germany, which was later validly described by Kützing (1844) as Cyclotella meneghiniana. Since Ehrenberg did not validly publish his findings, Kützing’s Cyclotella meneghiniana has priority. Kützing’s treatment of C. kuetzingii as a synonym of C. operculata was not correct (see Kützing 1844: 50). Our findings provide the first dated occurrence for Cyclotella meneghiniana (as Discoplea kuetzingii) in Berlin (1837 instead of 1895, as published in Geissler & Kies 2003). There is no unmounted material for modern slide or SEM preparations available at BHUPM.

Cyclotella comta Kütz. in Sp. Alg., 20. 1849 (Pl. 2).

≡ Puncticulata comta (Kütz.) Hákansson in Diatom Res. 17: 113. 2002.


Type (conserved): Germany, Hochsimmer, Grunow 1298 (W), the name typified was given as Discoplea comta Ehrenb. in Greuter et al. (2000: 376) and corrected to Cyclotella comta Kütz. in McNeill et al. (2006: 421).

Epitype (hic designatus!): BHUPM 410811-1 (Label: “Lectotypus Hákansson”) (Pl. 2A-B). Isoepitype (hic designatus!): BHUPM 410802-2 (Pl. 2C-D).

The reasons for our epitypification are twofold: 1) the epitype is in better accordance with the historical and current taxonomic understanding than Grunow’s material which is the conserved type (represented by Hakansson’s figure 411 of 2002) and 2) this specimen was in Ehrenberg’s hand at the time of description; Kützing had validated this species based on Ehrenberg’s (1844b) Discoplea comta by recombining it with a valid genus.

Pl. 1 - *Cyclotella meneghiniana* Kützing. A. Ehrenberg’s drawing sheet no. 478 in BHUPM showing a *Lemna* plant (left site) and a detail of the plant with epiphytic centric diatoms named *Discoplea kuetzingii* Ehrenberg [nom inval.]. B-F. Voucher slide (mica) 540067-6 in BHUPM (compare Tab. 1). C-D. Close up of two valvar views. Note valve face fultoportulae. E-F. Close up of two cells in girdle view. E. Note the slight tangential undulation. Scale bars 10 µm.

Tav. 1 - *Cyclotella meneghiniana* Kützing. A. L’illustrazione di Ehrenberg no. 478 in BHUPM che mostra una pianta di *Lemna* (sulla sinistra) e un dettaglio della pianta con diatomee centriche epifitiche indicate come *Discoplea kuetzingii* Ehrenberg [nom inval.]. B-F. Preparato permanente di riferimento (mica) 540067-6 in BHUPM (si confronti con Tab. 1). C-D. Dettaglio con due visioni valvari. Si notino le fultoportule sulla faccia della valva. E-F. Dettaglio con due cellule in visione commessurale. E. Si noti la debole ondulazione tangenziale. Le barre con la scala misurano 10 µm.

Tab. 1 - Morphological features of *Discoplea kuetzingii* and *Cyclotella meneghiniana*. Mean values underlined.

<table>
<thead>
<tr>
<th></th>
<th><em>Discoplea kuetzingii</em> (original material in BHUPM)</th>
<th><em>Cyclotella meneghiniana</em> (from Håkansson 2002)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central area</td>
<td>valve face more or less tangentially undulate</td>
<td>valve face more or less tangentially undulate</td>
</tr>
<tr>
<td>Valve diameter (µm)</td>
<td>16.8-25.0-27.6 (n= 30)</td>
<td>5.0-45.0</td>
</tr>
<tr>
<td>Valve face fultoportulae</td>
<td>1-2-3 (n= 30)</td>
<td>1-3</td>
</tr>
<tr>
<td>Central field / valve diameter</td>
<td>0.41-0.54-0.57 (n= 30)</td>
<td></td>
</tr>
<tr>
<td>Radiating striae per 10 µm</td>
<td>8-9 (n= 2)</td>
<td>6-10</td>
</tr>
<tr>
<td>Valve diameter / mantle height</td>
<td>1.72-2.41-3.07 (n= 5)</td>
<td></td>
</tr>
</tbody>
</table>
Pl. 3 - Discoplea sorrentina Ehrenberg [nom inval.]. a-b. Labiate processes and valve face with pseudonodulus on voucher slide (mica) BHUPM 290103-2; valve in two different views. C-D. EHrenberg’s drawing sheet no. 479 of in BHUPM. D-E. Valvar views on slide (mica) BHUPM 290103-5; valve in two different views. F-H. Girdle views of air dried cells on slide (mica) BHUPM 290103-3. D-E respectively F-G. Valve in two different views. Scale bar = 10 µm.

Pl. 2 - Cyclotella comta Kützing. A-B. BHUPM 410811-1, epitype of Cyclotella comta; valve in two different views. C-D. BHUPM 410802-2, isoepitype; valve in two different views. Scale bar = 10 µm.

Tav. 2 - Cyclotella comta Kützing. A-B. BHUPM 410811-1, epitipo di Cyclotella comta; valva in due differenti visioni. C-D. BHUPM 410802-2, isoepitipo; valva in due differenti visioni. La barra con la scala misura 10 µm.
Ind. loc.: “In mari neapolitano ad Sorrentum Augusto valde frequer cum algis”.

Voucher specimens: BHUPM 290103-2, BHUPM 290103-3, BHUPM 290103-5 “Mare Neapolit. Sorrenta 30 Aug. 1858”.

Further original material: drawing sheet no. 479 in BHUPM, reproduced as Pl. 3C.

D. sorrentina is a centric with a marginal ring of rimoportulae (Pl. 3A) and one single pseudonodulus (Pl. 3B). Areolation is not clearly radiate.

The mounted valves show a marine centric cf. Roperia Grunow ex Pelletan (compare Round et al. 1990: 198). Because not enough details can be seen on the preparation in BHUPM (Pl. 3A-B, D-H), the taxonomic identity of the species remains unclear.

4. DISCUSSION

In accordance with Silva (2003), we consider the genus Discoplea as being invalidly published in 1840 (with respect to the ICZN (International Commission on Zoological Nomenclature 1999) as well as to the ICBN (McNeill et al. 2006)).

If validly published, the type of the name of the genus Discoplea would have been D. kuetzingii as stated by Round et al. (1990). If validly published D. kuetzingii would have priority over C. meneghiniana.

With respect to Cyclotella comta, the conserved type in W has to be commented. We fully agree with the typification of C. comta with Hochsimmer material because of name stability. But since Kützing referred explicitly to Ehrenberg, it is unrepresentable why Grunow’s material of Hochsimmer was selected as the conserved type. Håkansson’s (2002) figure 411 of Grunow’s specimen on slide no. 1298 does not unambiguously represent the taxonomic entity intended to be conserved, we doubt that her figure 410 really belongs to the cited preparation because of the different quality in resolution. Ehrenberg’s voucher specimen of Hochsimmer in BHUPM shows exactly what Ehrenberg depicted and described. Without correcting the conserved type we are thus providing an epitype on the basis of the conserved type for further usage of the name, which is also type of the name of the genus Puncticulata Håk.

ACKNOWLEDGEMENTS

This study within the AlgaTerra-Project was financed by the German BMBF, grant no. 01 LC 0026.

REFERENCES


Kützing F.T., 1844 - Die kieselhalschigen Bacillarien oder Diatomaceen. F. Förstemann, Nordhausen: 152 pp., XXX pls.


Accettato per la stampa: 16 settembre 2008