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DISCOVERY OF THE TYPE SPECIMEN OF PINNULARIA GASTRUM EHRENBERG, THE TYPE SPECIES OF THE GENUS PLACONEIS MERESCHKOWSKY

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DISCOVERY OF THE TYPE SPECIMEN OF *PINNULARIA GASTRUM* EHRENBERG, THE TYPE SPECIES OF THE GENUS *PLACONEIS* MERESCHKOWSKY

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A specimen was discovered in the Ehrenberg Collection at BHUPM that can serve as lectotype of *Pinnularia gastrum*, the type species of *Placoneis* Mereschkowsky. Previously, Cox was unable to find an authentic specimen in the Ehrenberg Collection and therefore proposed to conserve the binomial with a Donkin specimen at the BM. The usefulness of conserving names to settle uncertainties of typification is discussed. In addition, *Pinnularia placentula*, a species morphologically similar to *P. gastrum*, is lectotypified with Ehrenberg's original drawing. Since the type specimen is lost, Cox's proposed neotype can serve as epitype.

INTRODUCTION

The diatom genus *Placoneis* was established by Mereschkowsky (1903). Cox (1987: 155) when re-erecting this genus, chose *P. gastrum* (Ehrenberg) Mereschkowsky as type of the name of the genus. In her recent paper, while further delineating her taxonomical concept of this genus, Cox (2003) tries to typify Ehrenberg's species. Since she was unable to find a suitable specimen in Ehrenberg's material, she proposes a new type; i.e. she chooses Donkin's material from the British Museum as type for Ehrenberg's name. The ICBN (Greuter *et al.* 2000) is clear in its rules to restrict the application of a name to the original material – when it is available – which the describer has at hand at the time of description.

Any deviation from this has to be proposed, voted upon in order to be conserved and published in the ICBN which appears every 6 years. Since the author has been typifying many Ehrenberg names as part of the AlgaTerra Project, she has found the original specimen which Ehrenberg had at hand when he described this taxon. Therefore there is no need to conserve *P. gastrum* with a different type than Ehrenberg's.

Ehrenberg first described this species as *Pinnularia gastrum* in his America Paper (1843: 421) from three syntype localities, but from only one locality he did publish a figure. Ehrenberg's later figures and localities which he published i.e. in his *Mikrogeologie* (1854) are not relevant in the context of typification.

In the America paper, Ehrenberg also described *Pinnularia placentula* (1843: 421) as new; since this taxon has also been transferred to *Placoneis*, looks very similar and shares one type locality with *Pinnularia gastrum*, it is also lectotypified in this paper. Since Cox (2003) did not find a specimen, she proposed a neotype which is formally incorrect since Ehrenberg's illustration, which is part of the original material (ICBN art. 9, note 2) was not taken into account for lectotypification.

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MATERIAL AND METHODS

From the Ehrenberg Collection at BHUPM the following material was investigated:

1. Mexico, Vera-Cruz, Meeresküste, Seealgen und Meeresabsatz [coast of the ocean, seaweeds and sediments], leg. Carl Ehrenberg 1838 (Ehrenberg 1843: 322). Ehrenberg's drawing No. 2062 & No. 2063; sample 1227 a+b+c; Geographical Preparations 200301–08.
2. USA, Connecticut, Newhaven, Brenntorf [fuel peat]; leg. Prof. Bailey (Ehrenberg 1843: 343); Ehrenberg's drawing No. 2235; sample 1765; Geographical Preparations 260609–16.
3. Iceland, Husavic, 79°N 342W, Brenntorf [fuel peat], leg. Dr. Thienemann 1821 (Ehrenberg 1843: 362). Ehrenberg drawing No. 2223; sample 2297; Geographical Preparations 351014–16.

Photographs in the Ehrenberg Collection were taken with an Olympus DP 50 and BX 51, Objective: Olympus 80x: IC 80/0.75, 40x UPlan Fl 40/0.75, 20x: UPlan Fl 20/0.50; 10x: UPlan Fl 10/0.30.

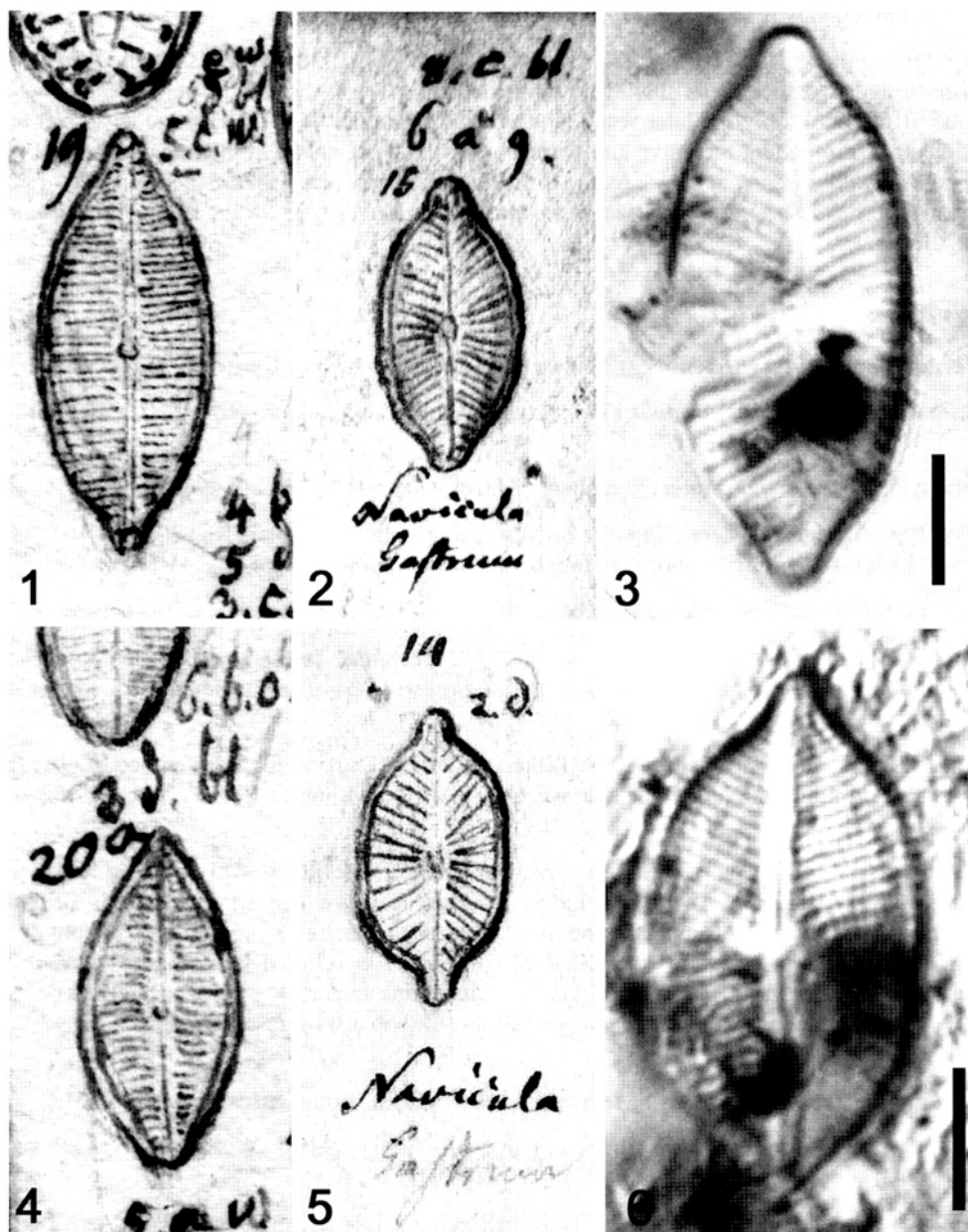
OBSERVATIONS ON EHRENBURG'S ORIGINAL MATERIAL

1. Vera Cruz (type locality for *P. placentula* and syntype locality for *P. gastrum*):

The preparations of this tray 2003 are in bad condition; micas have fallen off the strips, rings have fallen off the mica and the mica-strip No. 5 is missing completely. On the drawing sheet the specimens are not labelled but some can be found by comparison with the published plate (Ehrenberg 1843, pl. III: fig. VII). According to the drawing sheet No. 2062, with No. 19 written beside it in red ink, three specimens of *P. placentula* should be on mica-strip 200305: c white, e white and d blue, but unfortunately this strip is missing completely. This means the only available specimen for typification of *P. placentula* is Ehrenberg's drawing (reproduced here, Fig. 1). For *P. gastrum* according to the drawing sheet No. 2062, with No. 20a written beside it in red ink (reproduced here, Fig. 4), two specimens should be on mica-strip 200302 d blue and 200306 b orange, but the first mica is missing and on the second no specimen was discovered. On the labels beneath the mica-strips, the names *P. gastrum* or *P. placentula* never appear but *Navicula* appears 4 times without an epithet; the search here was unsuccessful. The Vera Cruz drawings of both taxa have parallel striae; the only difference is size; *P. placentula* being the larger. Also strange is the locality: a marine habitat.

2. Newhaven (syntype locality for *P. gastrum*):

On the drawing sheet No. 2235 (reproduced here, Fig. 5), the valve No. 14 is labelled *Navicula gastrum?* and should be on strip 2 a violet (= 260610 a violet). This specimen was found and photographed (Fig. 6); it shows radial striae throughout the valve just as its drawing on 2235. This is in contrast to the drawing of Vera Cruz where they were drawn parallel just as for *P. placentula*. On the mica-strip-labels the name *P. gastrum* does not appear but *Navicula* without an epithet does.



Figs 1–6. Original material of *Placoneis gastrum* and *P. placentula* from the Ehrenberg Collection at BHUPM. **Fig. 1.** Lectotype of *Placoneis placentula* from drawing No. 2062, Vera-Cruz, Mexico. **Figs 2 & 3.** *Placoneis gastrum* from Husavic, Iceland. **Fig. 2.** From drawing No. 2223. **Fig. 3.** Lectotype in Geographical Preparations 351016 c blue. Scale bar = 10 μ m. **Fig. 4.** “*Pinnularia gastrum*” from drawing No. 2062, Vera-Cruz, Mexico. **Figs 5 & 6.** “*Pinnularia gastrum*” from New Haven, Connecticut, USA. **Fig. 5.** From drawing 2235. **Fig. 6.** Specimen in Geographical Preparations 260610 a viol. Scale bar = 10 μ m.

3. Iceland (syntype locality for *P. gastrum*):

On the drawing sheet No. 2223 (reproduced here, Fig. 2), the valve is labelled *Navicula gastrum* and two specimens should be on mica-strip 6 a g (= 351014 a yellow) and 8 c bl (= 351016c blue); only the later was found and photographed (Fig. 3). The one specimen has radial striae throughout the valve and corresponds to the drawing. On the mica-strip-label the name *Navicula gastrum* appears. As the drawing sheet and mica-strip are clearly labelled and fit Ehrenberg's description, this specimen should be chosen as type for the name of the species and the genus.

RESULTS***Placoneis placentula* (Ehrenberg) Mereschkowsky in Beih. Bot. Centralbl. 15: 24. 1903.**

Basionym: *Pinnularia placentula* Ehrenberg in Abh. Königl. Akad. Wiss. Berlin 1841: 421. pl. III: fig. VII, 22. 1843.

Synonym: *Navicula placentula* (Ehrenberg) Kützing, Kieselschal. Bacill.: 94. 1844.

Lectotype (designated here): Fig. 19 on Ehrenberg's drawing sheet No. 2062 in BHUPM which is his original figure for Ehrenberg 1843 (reproduced here, Fig. 1).

Type locality: Vera Cruz, Mexico (seaweeds and sediments from the coast of the ocean).

Ehrenberg's diagnosis reads (1843: 421): "*P. Placentula*, testula minor, late lanceolata oblonga, apicibus constrictis obtusis parum productis, papillaribus. Icon! *P. Gastro* valde affinis, longior."

Epitype (designated here): BM 93093 (Lilliesleaf Pond), England finder reference M39/1; for a description and further details see Cox in Bot. J. Linnean Society 141, pp. 62–63, fig. 48. 2003.

Since all marked specimens are lost, Ehrenberg's drawing has to serve as lectotype. Cox's (2003) designation of a neotype is incorrect because part of Ehrenberg's original material – his drawing – is available but her "type" specimen can be turned into an epitype if it interprets the lectotype. In Cox (2003: 62) the name is referred to *Placoneis placentula* (Ehrenberg) Heinzerling, but in fact this is a taxonomic concept by Heinzerling (1908: 71, pl. 1, fig. 20) which refers to *Placoneis placentula* (Ehrenberg) Mereschkowsky.

***Placoneis gastrum* (Ehrenberg) Mereschkowsky in Beih. Bot. Centralbl. 15: 3. 1903.**

Basionym: *Pinnularia gastrum* Ehrenberg in Abh. Königl. Akad. Wiss. Berlin 1841: 421. 1843.

Lectotype (designated here): Geographical Preparations 351016 c blue in BHUPM (see Fig. 3 and compare it to original drawing Fig. 2).

Locus typicus: fuel peat, Husavic, Iceland, 79°N 342W.

Ehrenberg's diagnosis reads (1843: 421): "*P. Gastrum*, testula minor ventre late lanceolato, apicibus constrictis obtusis, parum productis, papillaribus. Icon!"

Cox (2003) had made new LM and SEM preparations of Ehrenberg's original Iceland material and presented corresponding specimens (her figs 103 & 107) but named them *Placoneis amphibola* (Cleve) E.J. Cox, a taxon which she newly recombined in that paper but unfortunately without presenting Cleve's type specimen.

DISCUSSION

The above findings in the Ehrenberg Collection show that Ehrenberg's specimen can be found. This requires a certain amount of experience with this large and complicated collection. In some cases, such as for *P. placentula*, the material is in bad shape or missing and then Ehrenberg's drawing have to be used for the type.

In her thorough treatise on the genus *Placoneis*, Cox (2003) extensively traces the different species concepts through the decades but does not cut a clear line to the date of the first description and the specimen the author had at hand while describing and attaching the name. Cox (2003: 57) writes: "No specimens of *N. gastrum* were found although there were a few specimens of *Navicula semen* Ehrenberg sensu Donkin and *Navicula amphibola* Cleve in the Iceland material." This lead to the conclusion: "In the absence of specimens of *P. gastrum* in original Ehrenberg material, but the possibility that *N. amphibola* or another unnamed *Placoneis* sp. represent the taxon illustrated by Ehrenberg, retention of the established usage of *P. gastrum* requires the formal conservation of that name with a conserved type." Since modern usage of her concept was traced to Donkin, she proposed to conserve Donkin's concept and Donkin's specimen. Nomenclature is the science of applying names to species, typification is the determination of a specimen to which the name tag is attached, that calibrates the usage of this name. If a type specimen is available, it should be used according to the describing author. Since Ehrenberg's material contains specimen applicable to his protologue and drawings, it is superfluous not to apply the name according to the rules of nomenclature. In addition, the true *P. gastrum* fits the current circumscription of the genus *Placoneis* and therefore does not endanger the concept of this genus.

It is difficult to get hold of old collections and to use them properly. Often researchers look for a current taxonomic concept of a species in the collection, unaware how concepts have changed over decades and centuries. Since the Ehrenberg Collection is now available, in pretty good condition surviving two world wars, and typification can bring usable results (Lazarus & Jahn 1995, Jahn & Sterrenburg 2003, Crawford *et al.* 2003), it should be used for the purpose of calibration: tying a name to a specimen. This name tag on a specimen is not taxonomy; but nevertheless could ruin one's own taxonomic concept of a taxon which has been handed down from generation to generation or has been acquired through books (e.g. floras, identification keys) and other literature. Often these concepts have not only evolved historically but also geographically depending on the books used and the floras seen. Until recently in diatom research, it was an uncommon scientific practice to consult the types; second hand interpretations were used and thought to be sufficient. A dramatic example of this historic fault is the type of *Frustulia rhomboides* Ehrenberg (Lange-Bertalot & Jahn 2000) which turned out not to be even a *Frustulia* but a *Navicula* sensu stricto; not a single specimen of *Frustulia* was in the entire sample because the original material was from a habitat or assemblage that would not contain any *Frustulia*. Mann's (2001) reaction to the correct application of an Ehrenberg name shows how much it hurts to see one's concept vanish. The first typification of the author of an Ehrenberg name resulted in such a strong reaction from German colleagues that it ended up in the typification of *Gomphonema vibrio* Ehrenberg having a different conserved type specimen sensu Grunow (Jahn & Lange-Bertalot 1995); Ehrenberg's species became *Gomphonema archaevibrio* Lange-Bert. & E. Reichardt (in Reichardt 1995). This proposal was almost turned down by the algae nomenclatural committee; today the author would hesitate to submit such a proposal.

The danger of conserving names with different types lies in the fact, that current concepts are conserved. With the present renunciation of broad taxon concepts as represented by Hustedt and Lange-Bertalot until 1990, and the turn to small circumscriptions, our concepts of taxa are undergoing change which effect the usage of their names. In addition, we do not know what the molecular character will do to our morphometric taxonomic concept of the

diatoms. We might as well use the true types as required by the ICBN and forget about conservation of current concepts – at least until we understand more about diatom taxonomy.

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