



Clarification of some conflicts around the typification of *Placoneis* (*Cymbellaceae*, *Bacillariophyceae*) and concepts of the genus

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The genus *Placoneis* was created by Mereschkowsky (1903: 3) but was subsumed within *Navicula* Bory for much of the 20th century until reinstated by Cox (1987: 155), emending Mereschkowsky's concept of the genus and designating *Placoneis gastrum* (Ehrenberg) Mereschkowsky as the type. This decision was made based on the prevailing concept of *Navicula gastrum* (Ehrenberg) Kützing at that time (Cox 1987, 2003). The basionym for the type is *Pinnularia gastrum* Ehrenberg (1843: 384, 421, pl. III: fig. VII.23) from Vera Cruz, Mexico (a marine locality) but by the mid-20th century, *N. gastrum* was being treated as a freshwater taxon. However, Ehrenberg (1843) also illustrated specimens from Brenntorf [fuel peat briquettes] in Newhaven, Connecticut (collected by J.W. Bailey) and an unknown locality in Iceland (collected by [F.A.]L. Thienemann), under "*N. gastrum*?", which had radiate rather than parallel striae (Jahn 2004), and there is therefore some confusion over species identities, and whether or not Ehrenberg considered them the same. Jahn (2004) treated these localities (Connecticut and Iceland) as syntype localities for *P. gastrum* (Jahn 2004), whilst treating the Vera Cruz sample as the type locality for *P. placentula* (Ehrenberg 1843: 384, 421, pl. 3: fig. VII.22) and the syntype locality for *P. gastrum* (Ehrenberg 1843: pl. 3, fig. VII.23). Whereas Kützing (1844: pl. 28: fig. 56) apparently copied Ehrenberg's illustration of his *P. gastrum* (Ehrenberg 1843: pl. 3: fig. VII.23), as did Rabenhorst (1853: pl. 6: fig. 15), Donkin (1873, pl. 3: fig. 10) interpreted *N. gastrum* from a Lough Mourne deposit [Co. Donegal, Ireland], a locality that Ehrenberg (1854: pl. 15, fig. 23) had added for *Pinnularia gastrum*, for a specimen with blunter apices and more clearly radiate striae. Donkin's concept of *N. gastrum* was followed by Hustedt in A. Schmidt, *Atlas* (1911: pl. 272, figs 9–19; 1934: pl. 398, figs 1, 2;) and Hustedt (1930: fig. 537; 1966: fig. 771). Thus *N. gastrum* referred to a taxon with slightly rostrate, bluntly rounded apices with radiate striae, *N. placentula* a taxon with more apiculate apices and only slightly radiate striae. These taxa are now recognised as distinct and their types are now accepted as:

Placoneis placentula (Ehrenberg) Mereschkowsky, 1903

Basionym: *Pinnularia placentula* Ehrenberg *Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin*, 1841: 421, pl. 3: fig. VII.22, 1843.

Lectotype (designated by Jahn 2004: 232): "Vera Cruz, Mexico (seaweeds and sediments from the coast of the ocean)." Fig. 19 on Ehrenberg's drawing sheet No. 2062 in **BHUPM** (see Jahn 2004: fig. 1)

Epitype designated by Jahn 2004: 232): **BM** 93093 (Lilliesleaf pond [near Melrose, Scottish Borders, Scotland]), England Finder reference M39/1.

Note: Jahn (2004: 231) commented "Also strange is the locality: a marine habitat." It remains unresolved as to how a diatom described from a marine habitat has since been only found in freshwater and similar habitats.

Placoneis gastrum (Ehrenberg) Mereschkowsky, 1903

Basionym: *Pinnularia gastrum* Ehrenberg *Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin*, 1841: 421, pl. 3: fig. VII.23, 1843.

Neotype (designated by Cox 2004: 57): **BM** 12187 (Lough Mourne deposit, 1870, A.S. Donkin)

Note: Jahn (2004) argued that *Pinnularia gastrum* should be rejected as the generitype for *Placoneis* because the illustration (Ehrenberg 1843, pl. 3: VII.22) lectotypified *Placoneis*, which,

as circumscribed at that time, included both *P. gastrum* and *P. placentula*. Thus, Jahn (2004: 233) stated “In addition, the true *P. gastrum* fits the current circumscription of the genus *Placoneis* and therefore does not endanger the concept of this genus.” In the same year, to formalise the use of *P. gastrum* as the generitype for *Placoneis*, Cox & Ross (2004) proposed that the name *Pinnularia gastrum* be conserved with a conserved type. This was subsequently accepted by the Committee for Algae (Compère 2005), with **BM 12187**, labelled ‘12 Lough Mourne Deposit. 1870 AS.D[onkin].’ conserved as the type for *P. gastrum* Ehrenberg. Specimens from this slide were illustrated (Cox 2003, figs 27–30) and therefore illustrate the current concept of *P. gastrum*, which remains the type for *Placoneis*.

In understanding what has gone on here, it is pertinent to consider the rationale behind the decision-making at the time. Cox (2003) was approaching the designation of the type of *Placoneis* from Mereschkowsky’s original description of the genus (1903) and his use of *P. gastrum* as the type. As summarised by Cox (2003: 53), “... it is clear that the concept of *P. gastrum* has shifted since Ehrenberg (1843) first described and illustrated it (as *Pinnularia gastrum*). Patrick & Reimer (1966: 518) commented that ‘one cannot be sure that the taxon which Ehrenberg and Kützing had in mind is the same as the one we recognise as *N. gastrum* today’.” [Donkin’s more informative illustration of *N. gastrum* from Lough Mourne (Donkin 1873 pl. 3: fig. 10), compared to the more rudimentary earlier illustrations (Ehrenberg 1843, pl. 3, VII, fig. 22; Kützing 1844: pl. 28: fig. 56; Rabenhorst 1853: pl. 6, fig. 15) seemed to initiate the acceptance of the species morphology and also its freshwater origin.) On the other hand, Jahn (2004) was concerned with correctly linking taxonomic concepts with the specimens used by Ehrenberg (1843) to describe new taxa, thereby establishing the value of the Ehrenberg collection itself to validate these. Thus, whereas Cox (2003) was concerned with specimens that corresponded to Mereschkowsky’s concept of *P. gastrum*, Jahn (2004) was concerned with specimens that Ehrenberg (1843) had illustrated under *Pinnularia gastrum*. It should be noted that Ehrenberg’s concept of *P. gastrum* was wider than today’s, accepting variation in the shape of apices, as well as the spacing and orientation of the striae, within a single species.

At the time, Jahn’s (2004) decision did not create any taxonomic complications, but more recently the concept of *Placoneis* was modified when Kulikovskiy & al. (2012) separated off those taxa with double rows of areolae in their striae into a new genus, *Paraplaconeis* Kulikovskiy, Lange-Bertalot & Metzeltin, typified by *Paraplaconeis kornevae* Kulikovskiy, Gusev & Lange-Bertalot. *Paraplaconeis* has biseriate striae and based on the type, there are small external flaps projecting into the areolae, strong offset bars separating the areolae internally. There is currently little evidence of areolar ultrastructure in other species of this genus, most biseriate *Placoneis* species are simply considered members of *Paraplaconeis*. Thus, *P. placentula* is now placed with *Paraplaconeis* and, even without conservation of *P. gastrum* (Cox & Ross 2004), no longer an appropriate generitype for *Placoneis*. The pore type in *Paraplaconeis* (*P. kornevae*) contrasts with the internal tectulum (*sensu* Cox 2004) in *Placoneis* (Lange-Bertalot & Wojtal [2014: fig. 80] show an internal view of *P. gastrum*). Currently, there is only limited evidence that all biseriate striae have the same ultrastructure.

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