



Observations on and lectotypification of *Paraplaconeis minor* (Grunow) Lange-Bertalot (Cymbellaceae, Bacillariophyceae)

Bart Van de Vijver¹ & Tanja M. Schuster²

¹Meise Botanic Garden, Research Department, Nieuwelaan 38, 1860 Meise, Belgium & University of Antwerp, Department of Biology – ECOSPHERE, Universiteitsplein 1, B-2610 Wilrijk, Belgium (correspondence: bart.vandevijver@plantentuinmeise.be)

²Natural History Museum Vienna, Department of Botany, Herbarium, Burgring 7, 1010 Vienna, Austria (correspondence: Tanja.Schuster@nhm.at)

Navicula placentula f. *minor* Grunow (in Van Heurck 1880; pl. VIII: fig. 26) was described based on a small population observed in a diatomite sample from the Oberoher Heide near the German village of Weesen (Südheide, Niedersachsen, Germany). Van Heurck (1885: 87) considered *Navicula placentula* to be a variety of *Navicula gastrum* (Ehrenberg) Donkin, which he based on the shape of the more rostrate apices and the striae in the central area, and proposed the new combination *N. gastrum* var. *placentula* (Ehrenberg) Van Heurck. He did not consider *N. placentula* f. *minor*, as it is nowhere mentioned in his text. Mereschkowsky (1903: 24) later transferred the species to his newly erected genus *Placoneis* as *P. placentula* (Ehrenberg) Mereschkowsky. He probably also considered *N. placentula* f. *minor* simply to be a size variant of *P. placentula* but did not mention it. Jahn (2004: 232) noted that Heinzerling (1908: 71) introduced the isonym *P. placentula* (Ehrenberg) Heinzerling.

According to Cox's (2003: 61) analysis, *Placoneis placentula* is a highly variable species: "...not only the size range is extensive, but variation is also observed in valve outline, apical shape and stria arrangement." Cox (2003: 62) also observed that "...the smallest morph [of *P. placentula*] (Cox 2003, figs 50–54) probably represents *N. placentula* fo. *minor* sensu Van Heurck (Fig. 40)..." but was not able to investigate the original material for the latter. Lange-Bertalot (in Metzeltin & al. 2005: 185) transferred *N. placentula* f. *minor* to the genus *Placoneis* and raised it to species level as the new combination *Placoneis minor* (Grunow) Lange-Bertalot. This transfer was based on the premise that the type of *P. placentula* was described from a marine sample from Vera Cruz (Mexico) and was therefore unrelated to *N. placentula*, which is generally accepted as a freshwater species. Lange-Bertalot was also unable to analyse the original material of *N. placentula* f. *minor*, nor was he able to observe *P. minor* in material from Uruguay (the monograph in which the new combination was published solely dealt with species from South America).

Following the split of the genus *Paraplaconeis* from Mereschkowsky's *Placoneis* by Kulikovskiy & al. (2012), the taxon was finally transferred to *Paraplaconeis* as *P. minor* (Grunow) Lange-Bertalot (in Lange-Bertalot & al. 2017: 471). *Paraplaconeis* is distinct from *Placoneis* in having biseriate striae (contrary to the uniseriate striae in *Placoneis*) and internally open but externally closed areolae. (*Placoneis* has internal coverings called tectula.) Since the original material for *P. minor* was never investigated, the justification for the transfer was based on other, non-type, populations, identified by interpreting the single drawing in Van Heurck's Atlas. The name was also never lectotypified.

As *Placoneis minor* was originally described by a drawing in Van Heurck's Atlas (1880, pl. 8: fig. 26), and most of Grunow's drawings are conserved in the Natural History Museum Vienna, Austria (W), the drawing depicted in Van Heurck could be pinpointed by means of its attendant information (see Schuster & al. 2022 for detailed guidelines on the complexities of and how to work with the Grunow collection). Briefly, Grunow added comments to his drawings, such as his sample number, on which he based the drawing, often measurements of the valve, and when used for a publication, the exact reference. Although the drawing of *N. placentula* f. *minor* itself was missing (Fig. 2), as it

was used to prepare plate VIII in Van Heurck's Atlas, with the original now conserved in the Van Heurck collection (Meise Botanic Garden, **BR**), the associated cut-out remainder (Fig. 1) indicates '26', i.e. the figure number in Van Heurck (1880), the name "*Navicula Placentula* Ehr forma *minor*" and sample number "1182 Oberohe".

Cleaned material of Grunow sample 1182 was still available at **W** and was ready for light and scanning electron microscopy analyses. A small population of valves corresponding to Grunow's *Navicula placentula* f. *minor* was observed in the sample. The observed valves show some variability in valve outline, shape of the apices and the central area, but this is insufficient for recognition as separate taxa (Figs 2–23), consistent with the general concept of this species (Lange-Bertalot & al. 2017, pl. 47: figs 47–51), i.e., that it is somewhat variable.

Here we detail observations on specimens of *P. minor* from the original Grunow diatomite sample 1182 collected from the Oberoher Heide; slides are kept in **W** and **BR**, and the SEM stub is at **BR**. A new slide made of the original Grunow sample 1182 is designated as lectotype at **W**. Figure 5 illustrates the lectotype.

Paraplaconeis minor (Grunow) Lange-Bertalot (in Lange-Bertalot & al. 2017, p. 471) (Figs 1–27)
Basionym: *Navicula placentula* f. *minor* Grunow, in Van Heurck *Synopsis des Diatomées de Belgique, Atlas*, pl. VIII [8]: fig. 26, 1880.

Homotypic synonym: *Placoneis minor* (Grunow) Lange-Bertalot (in Metzeltin & al. 2005, p. 183)

Lectotype (here designated): W0164961 (Fig. 5), slide prepared of original Grunow sample 1182, present in the Grunow collection (**W**).

Isolectotypes (here designated): W0164962, original Grunow slide made from sample 1182, kept in **W**; slide **BR-4856** prepared from original Grunow sample 1182, kept in **BR**;

Registration (of lectotypification): <http://phycobank.org/105107>

Type locality: Oberoher Heide, Niedersachsen, Germany

Homotypic synonym: *Placoneis minor* (Grunow) Lange-Bertalot (in Metzeltin & al. 2005, p. 185)

Description: Valves broadly elliptical to elliptical-lanceolate with convex margins. Apices acutely rounded to slightly protracted, rostrate (Figs 6, 9, 23). Valve dimensions (n=20): length 24–41 µm, width 11–15 µm. Axial area narrow, linear, slightly narrowing towards the apices. Central area small, transversely elliptical due to several irregularly shortened striae in the middle. Raphe almost straight, weakly undulating near the apices. Central raphe endings enlarged, spatulate. Terminal raphe fissures asymmetrically continuing onto the valve mantle, one side weakly deflected, the other strongly deflected, almost hooked. Striae radiate near the valve centre, more strongly radiate towards the apices, 10–12 in 10 µm. Striae biseriate, composed of small rounded areolae, positioned in quincunx. Near the valve margins, areolae often fused to form slit-like areolae. Internally central raphe endings very short, weakly hooked. Terminal raphe endings terminating onto small helictoglossae. Striae located in shallow grooves.

Cox, E.J. (2003). *Placoneis* Mereschkowsky (Bacillariophyta) revisited: resolution of several typification and nomenclatural problems, including the generitype. *Botanical Journal of the Linnean Society* 141: 53–83.

Heinzerling, O. (1908). Der Bau der Diatomeenzelle mit besonderer Berücksichtigung der ergastischen Gebilde und der Beziehung des Baues zur Systematik. *Bibliotheca Botanica* 15(69): 1–88.

Jahn, R. (2004). Discovery of the type specimen of *Pinnularia gastrum* Ehrenberg, the type species of the genus *Placoneis* Mereschkowsky. *Diatom Research* 19(2): 229–234.

Kulikovskiy, M.S., Lange-Bertalot, H., Metzeltin, D. & Witkowski, A. (2012). Lake Baikal: Hotspot of endemic diatoms I. *Iconographia Diatomologica* 23: 1–607.

Lange-Bertalot, H., Hofmann, G., Werum, M. & Cantonati, M. (2017). *Freshwater benthic diatoms of Central Europe: over 800 common species used in ecological assessments*. English edition

with updated taxonomy and added species (Cantonati, M. et al. eds). pp. [1]–942, 135 pls. Schmitt-Oberreifenberg: Koeltz Botanical Books.

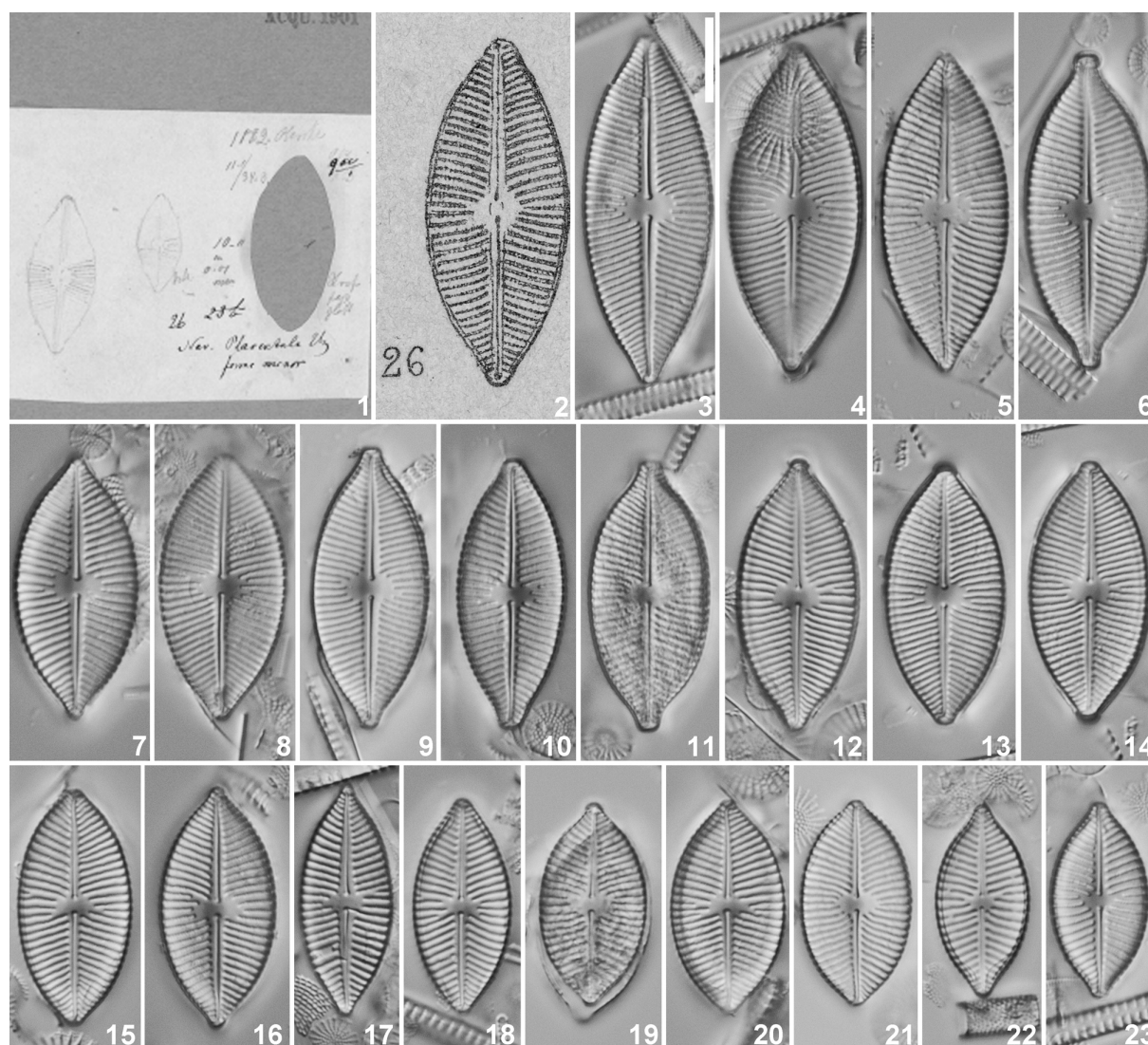
Mereschkowsky, C. (1903). Über *Placoneis*, ein neues Diatomeen-Genus. *Beihefte zum Botanischen Centralblatt* 15(1): 1–30.

Metzeltin, D., Lange-Bertalot, H. & García-Rodríguez, F. (2005). Diatoms of Uruguay. Compared with other taxa from South America and elsewhere. *Iconographia Diatomologica* 15: 1–736.

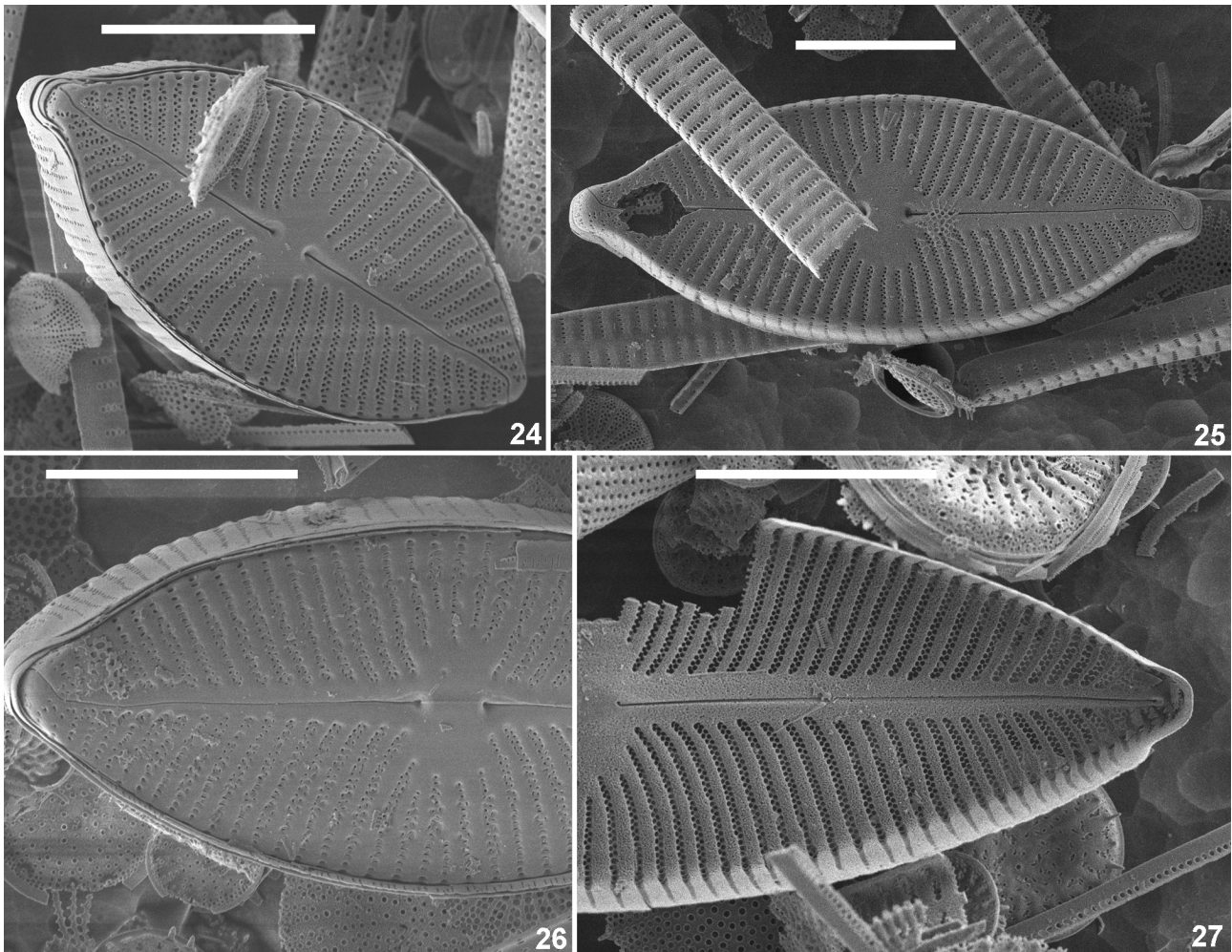
Schuster, T.M., Williams, D.M. & Van de Vijver, B. (2022). The diatom collection of Albert Grunow (1826–1914) at the herbarium of the Natural History Museum Vienna (W). *Annalen des Naturhistorischen Museums in Wien, Serie B*, 124, 331–362.

Van Heurck, H. (1880). *Synopsis des Diatomées de Belgique Atlas*. pp. pls I–XXX [pls 1–30]. Anvers: Ducaju et Cie.

Van Heurck, H. (1885). *Synopsis des Diatomées de Belgique. Texte*. pp. [1]–235. Anvers: Martin Brouwers & Co.



Figs 1–23. *Paraplaconeis minor* (Grunow) Lange-Bertalot. LM pictures taken from the isolectotype slide (slide **W0164961**, Grunow sample 1182, Oberhoher Heide, Niedersachsen, Germany). **Fig. 1** Original cut-out remainder of Grunow's drawing used to describe the species (the cut-out was used in Van Heurck's Atlas and stayed in his collection, now at BR). **Fig. 2** Original drawing of *Navicula placentula* f. *minor* published in Van Heurck (1880, plate VIII, fig. 26). **Figs 3–23** LM views of a size diminution series. Scale bar = 10 μ m.



Figs 24–27. *Paraplaconeis minor* (Grunow) Lange-Bertalot. SEM pictures taken from the sample, from which the lectotype slide **W0164961** was also prepared (Grunow sample 1182, Oberhoher Heide, Niedersachsen, Germany). **Figs 24–26** Three views of the external valve face showing the raphe structure and the biseriate striae. **Fig. 27** SEM internal view of half a valve. Scale bars = 10 μm .