Observations and typification of Navicula serians var. thermalis Grunow and its transfer to the genus Brachysira

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Navicula serians var. thermalis Grunow (in Van Heurck 1880: pl. 12: fig. 10) was originally described from unspecified hot springs in Eastern Asia (“in Thermen Ostindiens”) based on Grunow sample 928. Based on the notes in Grunow’s accession books, the sample was collected in 1865 and given to Grunow by the Czech palaeontologist Ferdinand Stoliczka (1838–1874), who made several expeditions to Burma, the Malay Peninsula, Singapore, and the Himalayas. A more precise locality where the sample was collected is not given. The same sample also served as type material for Achnanthes gibberula Grunow (in Cleve & Grunow 1880: 22), which was transferred to the genus Crenotia as C. gibberula (Grunow) Wojtal in 2013, although the type of Achnanthes gibberula was probably not investigated closely (Van de Vijver, pers. comm.). Grunow illustrated his new N. serians variety by a single line drawing in Van Heurck’s Synopsis des Diatomées de Belgique (1880). The original cut out for this drawing is kept at W (Vienna, Austria) and is the only original information we have for N. serians var. thermalis (Fig. 1). The taxon is extremely rare in the sample, which is also indicated by Grunow, who did not even list it for sample 928 in his accession book.

The taxonomic history of this taxon is convoluted. In 1895, Cleve transferred N. serians var. thermalis to the genus Anomoeoneis as A. exilis var. thermalis (Grunow) Cleve (1895: 8). Müller (1898: 66) placed it as a variety of Navicula exilis (Kützing) Grunow in the subgenus Anomoeoneis and named it N. exilis var. thermalis (Grunow) O.Müller. Hustedt (1930: 264) questioned the combination of var. thermalis with A. exilis and proposed to treat it as a form of Anomoeoneis serians var. brachysira [as A. serians var. brachysira f. thermalis (Grunow) Hustedt], basing his transfer on the more bluntly rounded apices and sturdier valve outline. He commented that he saw a lot of var. serians and var. brachysira together in samples and that several valves showed the typical protracted apices of Grunow’s var. thermalis. Later, Cleve-Euler (1953) transferred the variety thermalis to Anomoeoneis brachysira, invalidly employing the designation “A. brachysira β thermalis” (Grunow) A.Cleve. In the same year, Woodhead & Tweed (1953: 121) suggested a similar transfer, but as a form [A. brachysira f. thermalis (Grunow) Woodhead & Tweed]. Finally, when Ross (1986: 607) transferred A. brachysira to the genus Brachysira, renaming it B. brebissonii R.Ross, he included var. thermalis as a form of the latter [B. brebissonii f. thermalis (Grunow) R.Ross]. Wolfe & Kling (2001: 248, 250) stated that this taxon can only be considered a synonym of B. brebissonii. However, all these taxonomic treatments are solely based on the single line drawing in Van Heurck (1880) and did not involve analyses of the original Grunow type material from Eastern Asia (Ostindien).

Several hundreds of the original Grunow samples are conserved in the Van Heurck collection, part of the BR herbarium (Meise Botanic Garden, Belgium), and include Grunow sample 928. Although the sample only contained a few valves of N. serians var. thermalis, the observations made from the slide allowed a much better understanding of its correct taxonomic identity. Comparison of LM observations of type material of B. brebissonii (Van de Vijver 2014) and the valves found in Grunow sample 928 (Figs 2–7) indicated clear differences excluding a possible link between these taxa. Additional morphological details as seen through SEM show that the valve outline is clearly undulating and that the stria density is very high (Fig. 8). We therefore propose to separate N. serians var. thermalis from B. brebissonii and raise it to species level as Brachysira thermalis.
(Grunow) Van de Vijver & T.M. Schuster *comb. et stat. nov.*, and Grunow sample 928, conserved in BR (BR-4648), is here designated as the lectotype.

*Brachysira thermalis* (Grunow) Van de Vijver & T.M. Schuster, *comb. et stat. nov.* (Figs 2–8)

Basionym: *Navicula serians* var. *thermalis* Grunow in Van Heurck *Synopsis des Diatomées de Belgique, Atlas*, pl. XII [12], fig. 10, 1880

Lectotype designated here: BR-4648 Grunow sample 928 (*Thermen Ostindiens*, leg. F. Stoliczka s.n., 1865), material archived at the Van Heurck collection (BR). The lectotype is represented by Figs 2–8.

Isolectotypes: slide W0164801 and slide W0164802, both from Grunow sample 928 (W).


Description: Valves elliptic-lanceolate with convex margins, clearly undulating in larger valves (Fig. 2). Apices clearly protracted rostrate to subcapitate. Valve dimensions (n=6): length 17–27 μm, width ca. 6 μm. Axial area narrow, linear. Central area almost non-existent, very small, elliptical, apically elongated. Raphe filiform, straight with simple central endings. Terminal raphe fissures not discernible in LM. Striae hardly visible in LM, very fine, radiate throughout, 30–35 in 10 μm.


Van de Vijver, B. (2014). Analysis of the type material of *Navicula brachysira* Brébisson with the description of *Brachysira sandrae*, a new raphid diatom (Bacillariophyceae) from Iles Kerguelen (TAAF, sub-Antarctica, southern Indian Ocean). *Phytotaxa* 184(3): 139–147, 52 fig.


Figs 1–7. *Brachysira thermalis* (Grunow) Van de Vijver & T.M.Schuster, *comb. et stat. nov.* LM and SEM pictures taken from the lectotype population (Grunow sample 928, *Thermen Ostindien*, BR-4648). **Fig. 1.** Original drawing from the Grunow drawing collection (W) of *Navicula serians* var. *thermalis* Grunow. **Figs 2–7.** LM views. **Fig. 8.** SEM internal view. Scale bars = 10 µm.