

***Navicula metalanceolata* Lange-Bertalot & Kusber (*Naviculaceae*, *Bacillariophyceae*), a new name for *Frustulia lanceolata* Berkeley, *nom. illeg.*, *non* C.Agardh, referred to as “*Navicula lanceolata* (C.Agardh) Ehrenberg” or “*Navicula lanceolata* (C.Agardh) Kützing” in diatom research**

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The name *Frustulia lanceolata* C.Agardh (1827: 626) is the first name of a confusing synonymy in the genus *Navicula* Bory. Kützing (1834 ‘1833’: 542, pl. XIII: fig. 13) was the first to use Agardh’s name to identify and depict *Navicula* specimens from Lettin, near Halle, Germany. Later, Kützing (1844: 94) intentionally recombined *Frustulia lanceolata* C.Agardh *sensu* Kützing (1833) with *Navicula* and included Agardh’s *Cymbella lanceolata* (C.Agardh) C.Agardh in synonymy, thus referring indirectly back to *Frustulia lanceolata* C.Agardh (1827). *Navicula lanceolata* (C.Agardh) Kützing, 1844, however, was illegitimate (Turland & al. 2025: Art. 53.1) because in the meantime Ehrenberg (1838: 185) had described *Navicula lanceolata* as a new species. As he cited “*Frustulia lanceolata*, Kützing, Linnaea, 1833, p. 14. Tab. XIII, Fig. 13. Zu Teil” this was interpreted also to be an indirect citation of *Frustulia lanceolata* C.Agardh (1827). Interestingly, Ehrenberg described *Navicula lanceolata* Ehrenberg (1838: 185) without knowing the work of Agardh (1827) as he later mentioned in his addendum “*Nachtrag zu Frustulia*” (Ehrenberg 1838: 232).

Ruth Patrick (1907–2013) was the first to examine Agardh’s Collection at **LD** for original material and published a lectotype for “*Navicula lanceolata* (C.Agardh) Kützing (1844)” in Patrick & Reimer (1966: 511): “Lectotype–Ag. Herb. ‘Ge. B. A. + 4,’ designated by Patrick.” A drawing of the lectotype specimen is given in Patrick & Reimer (1966: pl. 48: fig. 19). Lange-Bertalot (1980) in his seminal work on *Navicula* again studied the same material and published LM micrographs of this species as his pl. 1: figs. 2–4. He did not question the credibility of Patrick’s lectotypification, but transcribed the label data in a slightly different way: “Lectotypus: Herbarium Agardh in Lund no. 3401 ‘*Frustulia lanceolata* Gl. B. A. t. 4’”. Lange-Bertalot interpreted *Navicula lanceolata* as a recombination by Ehrenberg (1838) and not by Kützing (1844) as the latter was illegitimate because of Ehrenberg’s name having priority (Lange-Bertalot 1980, Krammer & Lange-Bertalot 1986, Lange-Bertalot 2001).

Håkansson & Ross (1984) came across this typification when they attempted to stabilize the generic name *Cymbella* C.Agardh, 1830, *nom. et typ. cons.* They found that **LD** 3401 was not the original material of *Frustulia lanceolata* C.Agardh (1827) as the Agardh material connected to the type locality (Carlsbad) was **LD** no. 4560 (see also Silva & al. 2013), thus the lectotype in Patrick & Reimer (1966) was in conflict with Art. 9.3. (Turland & al. 2025). Håkansson & Ross (1984) suggested that the material **LD** 3401 was a reference “to Berkeley’s *Gleanings of British Algae* published in 1833” but they were not aware of the consequences of their finding for *Navicula* research. Lange-Bertalot (2001), however, was not aware of the publication of Håkansson & Ross (1984).

Briefly, Patrick (in Patrick & Reimer 1966) studied the ‘false’ *Frustulia lanceolata* in Agardh’s herbarium. *Frustulia lanceolata* Berkeley (1832) had been published alongside a description, including an illustration from living and herbarium material. As it was a later homonym of

Frustulia lanceolata C.Agardh (1827), Berkeley's name and taxon was overlooked for long time. We are convinced that **LD 3401** is the original material of *Frustulia lanceolata* Berkeley (1832), and we there here lectotypify his name with a specimen from **LD 3401** material and classify Berkeley's taxon in *Navicula* and give a necessary replacement name.

Navicula metalanceolata Lange-Bertalot & Kusber, *nom. nov.*

Replaced synonym: *Frustulia lanceolata* Berkeley, *Gleanings of British Algae* 13, pl. 4, fig. 1. 1832 "1833", *nom. illeg.* (Turland & al. 2025, Art. 53.1.), *non Frustulia lanceolata* C.Agardh, 1827 *nec Navicula lanceolata* Ehrenberg, 1838.

Lectotype (here designated): **LD 3401**, Coll. C. Agardh "Gl. B. A. t.4 *Frustulia lanceolata*", the lectotype specimen is illustrated in Lange-Bertalot (1980: pl. 1: fig. 2).

Lectotype locality: small shallow brook, possibly Margate, Kent, SE England, where the Rev.

Berkeley was in residence at the time (see the "Notice" at the beginning of *Gleanings of British Algae*).

Further original material: **BM001248679**

<https://data.nhm.ac.uk/object/c8df6f7e-0853-4328-b57d-9e69d19bdd08/1778490040171>

Registration: <http://phycobank.org/107300> (name), <http://phycobank.org/107301> (lectotype).

Etymology: The epithet refers to [*Frustulia*] *lanceolata* as well as to [*Navicula*] *lanceolata*; "meta" refers to the later combinations in both genera.

Taxonomy and autecology of *Navicula metalanceolata*: we here treat the description of *Navicula lanceolata* [sic] "(C.Agardh) Ehrenberg" in Lange-Bertalot (2001: 87) as an emendation of Berkeley's description. *Navicula metalanceolata* from the lectotype material was published in Lange-Bertalot (1980) pl. 1, figs 2-4, and from recent material in Lange-Bertalot (2001): pl. 38, figs 15-22, Hofmann & al. (2013), pl. 39, reproduced also in Lange-Bertalot & al. (2017) on pl. 39 by LM and in Lange-Bertalot (2001) on pl. 69, figs 3, 4 by SEM.

Navicula metalanceolata is a eutrathentic species and one of the most common species of *Navicula* in running waters with mass developments in winter and spring at lower water temperatures. It occurs in a wide range from oligo- α -mesosaprobic conditions (Hofmann & al. 2013, Lange-Bertalot & al. 2017). It also occurs also in lakes and is not endangered in Germany (Lange-Bertalot 1996, Hofmann & al. 2018). For monitoring in accordance with the European Water Framework Directive, *Navicula metalanceolata* should replace DV 6864 in Mauch & al. (2003: 203).

It should be stressed that *Navicula lanceolata* Ehrenberg (1838: 185, pl, XIII [13]: fig. XXI [21]) is not conspecific with *Navicula metalanceolata* as can be seen from his illustration; however, because of the perceived reference to C.Agardh, Ehrenberg's taxon has not so far been studied in detail.

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