

New combinations of diatom names (*Bacillariophyta*) from the German checklist and Red List with remarks on their indicator values

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In 1996, the first German checklist and Red List for limnetic (non-marine) diatoms was published (Lange-Bertalot 1996) based on previously published monographs and floras (e.g., Krammer 1992, Krammer & Lange-Bertalot 1986, 1988, 1991a, b, Lange-Bertalot 1993). This was the basis for the first checklist for water organisms in Germany (Mauch & al. 2003), but many published changes in classification (e.g., Round & al. 1990) were not adopted.

Meanwhile, many new genera were split off from old morphological heterogeneous and polyphyletic genera (e.g., Hofmann & al. 2013, Krammer 1997, 2003, Krammer & Lange-Bertalot 2000, Lange-Bertalot 2001, Levkov 2009, Levkov & al. 2013, Round & Bukhtiyarova 1996). Many of these genera were included in the current German checklist and Red List for limnetic diatoms (Hofmann & al. 2018). Due to further taxonomic and nomenclatural treatments (e.g., Lange-Bertalot & al. 2017, Wynne 2019) and diatom taxa reported from German monitoring, the *Bundestaxaliste der Gewässerorganismen Deutschlands* (2021) should be updated. A current project (Schilling & al., in prep.) evaluates several German lists and sources related to the European Union Water Framework Directive (WFD, Mischke & al. 2018). Cross-checking of data revealed some inconsistencies in Hofmann & al. (2018) as partially shown by Guiry & Guiry (2021). We here focus on designations (ICN Art. 41.5, Turland & al. 2018) already used in the German checklist and some diatom names not recombined with the currently accepted genus name, especially in the genus *Luticola* (Levkov & al. 2013).

Achnanthidium nollii (O.Bock & W.Bock) Lange-Bertalot, *comb. nov.*

Basionym: *Achnanthes nollii* O.Bock & W.Bock in *Nachrichten des Naturwissenschaftlichen Museums der Stadt Aschaffenburg* 38: 54, pl. 2: figs 1, 2; pl. 5: figs 7–9. 1953.

Registration: <http://phycobank.org/102863>

Type: **FR** Kahl am Main, 12.8.1951, Verbindungsgraben zwischen den Freigerichtsseen.

Taxonomic note: Krammer & Lange-Bertalot (1991b) knew the taxon only from literature and expressed doubts as to whether the species was a distinct species of *Achnanthes*. Reinvestigation of the original material shows that the taxon belongs, with regard to shape and valve ultrastructure, to the species complex around *Achnanthidium minutissimum* (Kützing) Czarnecki.

Ecology: According to Hofmann & al. (2018: 611), an extremely rare eutrphentic (preferring high nutrients) species, named in the Red List for Germany.

Chamaepinnularia begeri* f. *constricta (Krasske) Lange-Bertalot, *comb. nov.*

Basionym: *Navicula begeri* f. *constricta* Krasske in *Bericht der Deutschen Botanischen Gesellschaft* 61: 85, figs 13, 14. 1943.

Registration: <http://phycobank.org/102871>

Lectotype: **KASSEL** C III 131 designated by Lange-Bertalot & al. (1996: 100).

Taxonomic note: In contrast to Lange-Bertalot & al. (1996) we are following Hofmann & al. (2018) as we are convinced that this forma is taxonomically meaningful and should not be synonymized with *Chamaepinnularia begeri* (Krasske) Lange-Bertalot f. *begeri*.

Ecology: According to Hofmann & al. (2018: 615), a rare species with unknown ecological preferences; part of the Red List in Germany without known status (Kategorie “G”).

Halamphora hassiaca (Krammer & S.Strecker) Lange-Bertalot, *comb. nov.*

Basionym: *Amphora hassiaca* Krammer & S.Strecker in Krammer, *Bibliotheca Diatomologica* 37: 225, pl. 206: figs. 1–8. 1997.

Holotype: **BRM** Präp. 27B IOK.

Registration: <http://phycobank.org/102864>

Taxonomic note: *Halamphora hassiaca* has a prominent ledge on the dorsal part of the outer valve as shown in Krammer (1997: pl. 206: fig. 7), a fascia, as known for *Amphora* species is lacking. The girdle bands have 50–60 poroids (Krammer 1997: 225). *Halamphora hassiaca* is distinguished from *Halamphora tenerrima* (Aleem & Hustedt) Levkov by its narrower striae 27–32/10 µm vs. 22–28/10 µm in *Halamphora tenerrima* (Krammer 1997: 225, Levkov 2009: 235).

Ecology: According to Hofmann & al. (2018: 632), this is a rare halophilous species, which is not threatened in Germany.

Halamphora streckeriae (Krammer) Lange-Bertalot, *comb. nov.*

Basionym: *Amphora streckeriae* Krammer in *Bibliotheca Diatomologica* 37: 226, pl. 206: figs 9–11. 1997.

Holotype: **BRM** Präp. 27B IOK.

Registration: <http://phycobank.org/102865>

Taxonomic note: *Halamphora streckeriae* has a ledge on the dorsal part of the outer valve as shown in Krammer (1997: pl. 206: fig. 9), a fascia, typical of *Amphora* species, is absent. The girdle bands have poroids (Krammer 1997: 226). Krammer’s taxon is smaller than *Halamphora obscura* Levkov but has a slightly different shape and narrower striae i.e. 30–34/10µm vs. 26–30/10 µm in *Halamphora obscura* (Krammer 1997: 226, Levkov 2009: 212).

Ecology: According to Hofmann & al. (2018: 633), this is a rare halophilous species which is not threatened in Germany.

Neidium lucinense (Hustedt) Metzeltin & Lange-Bertalot, *comb. nov.*

Basionym: *Neidium affine* var. *lucinense* Hustedt in *Archiv für Hydrobiologie* 43: 356, pl. XLI: fig. 52. 1950 (as ‘lucinensis’).

Registration: <http://phycobank.org/102866>

Lectotype (designated in Simonsen 1987: 358) “Holotype”: **BRM** Ne1/89, illustrated in Simonsen (1987: pl. 543: figs 17, 18).

Type locality (according to label data at **BRM**): Schmalen Lucin. 13 m. 16.8.24 [16 August 1924]. Marked specimen named on the label.

Note on typification: The statement “*Sehr selten im Schmalen Lucin*” [very rare in Schmalen Lucin], Hustedt (1950: 356) does not constitute designation or indication of a type in the original publication, and several slides from different gatherings were deposited in the Hustedt collection. Simonsen (1987: 358) while specifying “Holotype” effectively lectotypified the name with a marked specimen on a single slide.

Taxonomic note: The identity of *Neidium affine* (Ehrenberg) Pfitzer was only known from images from several localities in the Americas and the Caribbean, published by Ehrenberg (1843) until Hamilton & Jahn (2005) studied the original materials and lectotypified the species. Comparing the selected original material of the *Neidium affine* to Hustedt’s type specimen of *Neidium affine* var. *lucinense* as illustrated in Simonsen (1987 pl. 543: fig. 18), Hustedt’s taxon differs from *Neidium affine* by its apices, the greater length-to-breadth ratio of the valve and the much broader central area. The central area is elliptical in *Neidium affine* and irregularly angular occupying more than the half of the valve breadth (in between the longitudinal canals) in

Neidium lucinense. Thus, Hustedt's taxon should be treated as a separate species as compared to the original material of *Neidium affine*.

Ecology: According to Hofmann & al. (2018: 640), this is an extremely rare species which occurs in oligotrophic calcareous waters, and is thus included in the Red List for Germany.

Further comments on designations and names used in Hofmann & al. (2018)

Halamphora obscura Levkov, *Diatoms of Europe* 5: 211. 2009.

Replaced synonym: *Amphora obscura* Krasske in *Archiv für Hydrobiologie* 33: 530; pl. 11, figs 28-33. 1938, *non Amphora obscura* Reichelt 1903, p. 775, fig. 35.

Nomenclatural comment: The intention of Levkov (2009: 211) is clearly expressed. While the identity of the validly published *Amphora obscura* Reichelt (ICN Art. 37.8, Turland & al. 2018) is uncertain (Levkov 2009: 212), *Amphora obscura* Krasske, *nom. illeg.* (ICN Art. 53.1, Turland & al. 2018) was identified in Krasske's original material, and a syntype **KASSEL** A III 51 from Spitsbergen was illustrated in Lange-Bertalot & al. (1996: pl. 37: figs 12-17). The illegitimate name *Amphora obscura* Krasske was replaced as *Amphora spitzbergensis* VanLandingham (1967: 270). Levkov used Krasske's name in *Halamphora* but published it erroneously. Because Levkov (2009: 211) gave a full and direct citation of Krasske's and VanLandingham's names, we conclude that his nomenclatural act includes correctable errors (cf. ICN Art. 6.14 Ex. 18, Turland & al. 2018), and thus the term "basionym" should be read as "replaced synonym" and the authority of *Halamphora obscura* should be read as "Levkov" instead of "(Krasske) Levkov".

Ecology: According to Hofmann & al. (2018: 632) an oligotraphentic species.

Mastogloia albertii A.Pavlov, Jovanovska, C.E.Wetzel, Ector & Levkov in *Diatom Research* 31: 103, figs 209-239. 2016.

Replaced synonym: *Mastogloia smithii* var. *amphicephala* Grunow in Van Heurck, *Synopsis des Diatomées de Belgique Atlas.*: pl. IV: fig. 27. 1880.

Comment: Instead of the accepted name, "*Mastogloia amphicephala* Grunow" was used in Hofmann & al. (2018). "*Mastogloia amphicephala* Grunow" is an invalid designation that has never been published; in any case, the epithet at the rank of species was already taken by Zakrzewski (1934: 133, fig. 2) according to Guiry & Guiry (2021).

Ecology: According to Hofmann & al. (2018) *Mastogloia albertii* is a very rare eutraphentic species, included in the Red List for Germany.

Navicula mutica f. *gibbosa* McCall in *Journal of the Linnean Society of London, Botany* 49: 305, fig. 10. 1933.

Type: Film on stones under fast-flowing water leading into pond, Fowlis, Tay district, Scotland, no. 51. The type was indicated by McCall (1933: 305) in citing one single gathering. This taxon was incorrectly cited as "*Navicula mutica* var. *gibbosa* McCall" in Hofmann & al. (2018).

Taxonomic note: Even though this taxon should be included in the genus *Luticola* (see also Levkov & al. 2013: 268), we refrain from recombining it formally with *Luticola* because no preparation of the original material has been examined and McCall (1933, fig. 10) provided only a line drawing.

Ecology: According to Hofmann & al. (2018: 638), the data are insufficient for this taxon with respect to ecological valence and frequency.

Navicula mutica var. *gibbula* Hustedt in *Archiv für Hydrobiologie* 40(4): 915, pl. XLI: fig. 41. 1945.

Homotypic synonym: *Navicula mutica* f. *gibbula* (Hustedt) Hustedt, *Rabenhorst's Kryptogamen Flora von Deutschland, Österreich und der Schweiz* Vol. VII, Part 3: 586. 1966.

Lectotype (designated in Simonsen 1987, as “Holotype”): **BRM** N5/88, illustrated in Simonsen (1987: pl. 507: figs 6–8).

Type locality (according to label data at **BRM**): “Krka-Quellen bei Laibach. 3” in Hustedt (1945); however, there is no internal evidence in the publication that only one gathering was used for the description; subsequently, Hustedt (1966) specified that the taxon was based on a single gathering “Einzelfund” [single find], however Simonsen was the first to typify the name.

Taxonomic note: Even though this taxon should perhaps be included in the genus *Luticola*, we refrain from recombining it formally with *Luticola* because it is only known from the type locality from a single valve. It is also not clear to us if the validly published name represents a taxon at the specific or infraspecific rank or illustrates merely a life cycle state of a *Luticola*.

Ecology: According to Hofmann & al. (2018: 638), data are insufficient for this variety (as *Navicula mutica* var. *gibbula*) with respect to ecological valence and frequency.

Navicula mutica var. *subundulata* Grunow in Van Heurck: pl. 10: fig. 20B. 1880.

Original material as published: Illustration by Grunow in Van Heurck (1880: pl. 10: fig. 20B), no type locality given.

Taxonomic note: Even though *Navicula mutica* var. *subundulata* Grunow was not listed as a taxon probably belonging to *Luticola* (Levkov & al. 2013: 268, 269) it is clearly to be classified within *Luticola*. We abstain from recombining it formally prior to the original material being studied in detail to confirm the identity of the taxon and to obtain some further geographical and ecological information.

Ecology: According to Hofmann & al. (2018: 638), the current data are insufficient for this this variety with respect to ecological valence and frequency.

We are grateful to our late colleague Ditmar Metzeltin (10 May 1945–31 July 2021) who contributed to the manuscript for *Neidium lucinense*. Many thanks to Bart Van de Vijver and Michael D. Guiry for their valuable suggestions and comments. G.H. and W.-H.K. acknowledge funding from the LAWA project “Anschubfinanzierung zur Übernahme der Pflege der Taxaliste der Gewässerorganismen Deutschlands durch das Umweltbundesamt” Grant no. O 3.20.

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