# Transfer of *Surirella* species from Madagascar to the genus *Iconella* (*Surirellaceae, Bacillariophyceae*)

Christine Cocquyt[1] & Bart Van de Vijver[2]

[1]*Meise Botanic Garden, Research Department, Nieuwelaan 38, 1860 Meise, Belgium (correspondence: christine.cocquyt@meisebotanicgarden.be)*
[2]*Meise 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)*

The diatom flora of Madagascar, studied by Metzeltin & Lange-Bertalot (2002), included thirteen *Surirella* Turpin taxa, two *Stenopterobia* Brébisson ex Van Heurck taxa and one *Cymatopleura* W.Smith taxon. Of these sixteen taxa, two species were newly described, indicating a distribution restricted to Madagascar. So far, these taxa have not been reported from other islands in the Indian Ocean. Four other *Surirella* taxa remained unidentified and were referred to as *Surirella* spec. No.1, *S.* spec. No.2 , *S.* spec. No 3 and *S.* spec. No 4.

Ruck & al. (2016a) reintroduced the genus *Iconella* Jurilj (1949), based on the structure of the raphe canal (always raised above the valve face and mantle), and the presence of alar canals with fenestral openings occluded by fenestral bars. This reintroduction was followed by the transfer of many taxa previously described as *Surirella* and *Stenopterobia* to *Iconella* (e.g. Ruck & al. 2016b, Jahn & al. 2017, Kapustin & Kulikovskiy 2018, Rytlewski & Burge 2025).

In a second paper, Ruck & al. (2016b) transferred the two *Stenopterobia* species and one of the *Surirella* species reported from Madagascar by Metzeltin & Lange-Bertalot (2002) to *Iconella*: *I. curvula* (W.Smith) Ruck & Nakov, *I. delicatissima* (F.W.Lewis) Ruck & Nakov, and *I. splendida* (Ehrenberg) Ruck & Nakov. Of the 12 other *Surirella* taxa, four unambiguously belong to the genus *Surirella sensu stricto*: *S. crumena* Brébisson, *S. stalagma* M.H.Hohn & Hellerman, *S. striatula* Turpin and *S. brebissonii* var. *kuetzingii* Krammer & Lange-Bertalot. Based on the description, light microscope and scanning electron microscope pictures (Metzeltin & Lange-Bertalot 2002), showing a raised raphe canal above the valve face and mantle and alar canals with fenestral openings occluded by fenestral bars, we can conclude that *Surirella archibaldii* Metzeltin & Lange-Bertalot and *S. costei* Metzeltin & Lange-Bertalot, both described from Madagascar (Metzeltin & Lange-Bertalot 2002) should be transferred to *Iconella*.

Another *Surirella species*, *S. muscicola* (Krasske) Lange-Bertalot & Metzeltin, illustrated in Metzeltin & Lange-Bertalot (2002: pl. 92: figs 1, 2 and pl. 93) also seems to belong to the genus *Iconella*. Krasske (1948: 439) had originally described the species from Brazil as *Surirella arctissima* var. *muscicola* Krasske but did not illustrate his new taxon. The variety was raised to species level by Lange-Bertalot (in Lange-Bertalot & al. 1996: 180) and transferred to the genus *Stenopterobia* as *Stenopterobia muscicola* (Krasske) Lange-Bertalot. Later, Lange-Bertalot & Metzeltin transferred the species back to the genus *Surirella* as *S. muscicola* in Moser & al. (1998: 222) presenting several valves observed in samples from São Paulo (Brazil) found in the Krasske collection (Moser & al. 1998: pl. 70, figs 4–6). Metzeltin & Lange-Bertalot (1998: pl. 215: figs 1–6) show further illustrations of Brazilian valves. It is, however, at present unclear whether the population observed in Madagascar by Metzeltin & Lange-Bertalot (2002), is conspecific with the type population of *Surirella arctissima* var. *muscicola* from Brazil.

In his description, Krasske (1948) mentioned that *Surirella arctissima* var. *muscicola* is related to *S. cuspidata* Hustedt (1942: 156, 157, figs 391-393), described from Celebes (currently Sulawesi, Indonesia) and *S. marginistriata* Hustedt ex Simonsen (1987: 98 '*marginestriata*') described from Brazil. This name was originally introduced by Hustedt (in Schmidt 1925: pl. 363: figs. 4–6)

without a description and post-1908, validation by illustration is not possible (Art. 38.9, Turland & al. 2025). *Surirella cuspidata* was transferred to *Iconella* by Kapustin & Kulikovskiy (2018: 239), whereas *S. marginistriata* has not. Simonsen (1987: 98, pl. 152: figs 3–6) illustrated the "lectotype" of *S. marginistriata*, two valves in valve face view and one frustule in girdle view, using solely LM observations. In these LM illustrations a highly raised raphe and alar canals with fenestral openings and fenestral bars are clearly visible, indicating that this taxon belongs to *Iconella*.

Given that Krasske mentioned a clear relationship between *S. arctissima* var. *muscicola* on one hand and *S. cuspidata* and *S. marginistriata* on the other hand, and that these two species belong to the genus *Iconella*, we can assume with near certainty that *Surirella arctissima* var. *muscicola* also should be transferred to *Iconella*. This is supported by the images provided by Lange-Bertalot & al. (1996: pl. 215: figs 1–6) and Moser & al. (1998: pl. 70: figs 4–6) where the valves show clearly a raised raphe and alar canals with fenestral openings and fenestral bars.

Further investigation of the four unidentified *Surirella* species (*Surirella* spec. No.1, *S.* spec. No.2 , *S.* spec. No 3, *S.* spec. No 4) from Madagascar and illustrated by Metzeltin & Lange-Bertalot (2002: pl. 86: fig. 5, pl. 92: fig. 6, pl. 94: figs 2–3 and pl. 94: figs 4–5 respectively), is needed to identify the identity of these taxa. All four clearly belong to the *Robustae* group, the group within the *Surirella sensu lato* with highly raised raphe and alar canals with fenestral openings and fenestral bars that is now considered to be *Iconella*.

***Iconella archibaldii*** (Metzeltin & Lange-Bertalot) Cocquyt & Van de Vijver, *comb. nov.*
Basionym: *Surirella archibaldii* Metzeltin & Lange-Bertalot in *Iconographia Diatomologica* 11: 76, figs 87: 7, 8; 88: 1–3; 89: 1–5; 90:1–3, 2002.
Holotype: **FR** Praep. Madag. 6/7 in Coll. Lange-Bertalot
Registration: http://phycobank.org/106504

***Iconella costei*** (Metzeltin & Lange-Bertalot) Cocquyt & Van de Vijver, *comb. nov.*
Basionym: *Surirella costei* Metzeltin & Lange-Bertalot in *Iconographia Diatomologica* 11: 77, figs 87: 9–11; 92: 3, 4; 93: 2, 2002.
Holotype: **FR** Praep. Madag. 6/2 in Coll. Lange-Bertalot
Registration: http://phycobank.org/106505

***Iconella marginistriata*** (Hustedt ex Simonsen) Cocquyt & Van de Vijver, *comb. nov.*
Basionym: *Surirella marginistriata* Hustedt ex Simonsen 1987: 98, pl. 152, figs 3–6, 1987 ('*marginestriata*').
Holotype ("Lectotype"): **B** ex **BRM** X1/29, Isotype ("Isolectotype"): **B** ex **BRM** X1/30
Registration: http://phycobank.org/106510

***Iconella muscicola*** (Krasske) Cocquyt & Van de Vijver, *comb. nov.*
Basionym: *Surirella arctissima* var. *muscicola* Krasske *Svensk Botanisk. Tidskrift* 42(4): 439 no fig., 1948.
Synonyms: *Surirella muscicola* (Krasske) Lange-Bertalot & Metzeltin (1998: 222). *Stenopterobia muscicola* (Krasske) Lange-Bertalot (1996: 180).
Lectotype (designated by Lange-Bertalot): **KASSEL** D IV 129, illustrated in pl. 52, fig. 3, 4 in Lange-Bertalot et al. (1996)
Registration: http://phycobank.org/106513

Hustedt, F. (1942). Süßwasser-Diatomeen des indomalayischen Archipels und der Hawaii-Inseln. *Internationale Revue der gesamten Hydrobiologie und Hydographie* 42: 1–252.
Jahn, R., Kusber, W.-H. & Cocquyt, C. (2017). Differentiating *Iconella* from *Surirella* (Bacillariophyceae): typifying four Ehrenberg names and a preliminary checklist of the African taxa. *PhytoKeys* 82: 73–112.

Jurilj, A (1949). Nove dijatomeje – Surirellaceae – iz Ohridskog jezera i njihovo filogenetsko značenje. *Prirodoslovna Istraživanja* 24: 171–260.

Kapustin, D. & Kulikovskiy, M. (2018). Transfer of *Stenopterobia* and *Surirella* taxa (Bacillariophyceae) described from the insular Southeast Asia to the genus *Iconella*. *Nova Hedwigia Beiheft* 147: 237–245.

Krasske, G. (1948). Diatomeen tropischer Moosrasen. *Svensk Botanisk Tidskrift* 42(4): 404–443.

Lange-Bertalot, H., Klaus Külbs, K., Lauser, T., Nörpel-Schempp, M. & Willmann, M. (1996). Diatom taxa introduced by Georg Krasske: documentation and revision. Dokumentation und Revision der von Georg Krasske beschriebenen Diatomeen-Taxa. *Iconographia Diatomologica* 3: 1–358.

Metzeltin, D. & Lange-Bertalot, H. (1998). Tropical diatoms of South America I. *Iconographia Diatomologica* 5: 1–695.

Metzeltin, D. & Lange-Bertalot, H. (2002). Diatoms from the "Island Continent" Madagascar. *Iconographia Diatomologica* 11: 1–286.

Moser, G., Lange-Bertalot, H. & Metzeltin; D. (1998). Insel der Endemiten. Geobotanisches Phänomen Neukaledonien. Island of endemics New Caledonia - a geobotanical phenomenon. *Bibliotheca Diatomologica* 38: 1–464.

Ruck, E.C, Nakov, T., Andrew, J., Alverson A.J. & Theriot, E.C. (2016a). Phylogeny, ecology, morphological evolution, and reclassification of the diatom orders Surirellales and Rhopalodiales. *Molecular Phylogenetics and Evolution* 103: 155–171.

Ruck, E.C., Nakov, T., Alverson, A.J. & Theriot, E.C. (2016b). Nomenclatural transfers associated with the phylogenetic reclassification of the Surirellales and Rhopalodiales. *Notulae Algarum* 10: 1–4.

Rytlewski, I.G. & Burge, D.R.L. (2025). Taxonomic transfers withing the *Surirellaceae* (*Bacillariophyceae*) from *Stenopterobia* to *Iconella*. *Notulae Algarum* 377: 1–2.

Schmidt, A.[F.W.] (1925). *Atlas der Diatomaceenkunde* Serie 91, pls 361–364. R. Reisland Ascherleben, Leipzig und Berlin.

Simonsen, R. (1987). *Atlas and catalogue of the diatom types of Friedrich Hustedt.* Vol; 1. Catalogue. Pp 1–525. Vol. 2 Plates 1–395. Vol. 3 Plates 396–772. J. Cramer bei Borntraeger, Berlin & Stuttgart.

Turland, N.J., Wiersema, J.H., Barrie, F.R., Gandhi, K.N., Gravendyck, J., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Klopper, R.R., Knapp, S., Kusber, W.-H., Li, D.-Z., May, T.W., Monro, A.M., Prado, J., Price, M.J., Smith, G.F. & Zamora Señoret, J.C. editors (2025). *International code of nomenclature for algae, fungi, and plants* (2025 Edition Madrid Code) *Regnum Vegetabile* Volume 162. pp. [i]–xlvii, 1–303. The University of Chicago Press, Chicago & London.