

## A taxonomic note on the genus *Rindifilum* Malavasi, Klimešová, Lukešová & Škaloud (*Ulvales*, *Ulvophyceae*)

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The genus *Rindifilum* Malavasi, Klimešová, Lukešová & Škaloud was recently described by Malavasi & al. (2022) to accommodate a distinct lineage of green filamentous algae within the family *Ctenocladaceae* (*Ulvales*, *Ulvophyceae*). This new genus includes a single species, *R. ramosum*, growing in association with the lichenized ascomycete genus *Verrucaria* Schrader. Presently, the family encompasses four genera: *Ctenocladus* Borzi, *Pseudopleurococcus* Vischer, *Spongioplastidium* Vischer and *Rindifilum*, morphologically well distinguished by thallus form, akinete formation, cell shape and chloroplast structure (Škaloud & al. 2018, Malavasi & al. 2022).

A few days before the publication of *Rindifilum*, a new species *Ctenocladus verrucariae* was proposed by Darienko & Pröschold (2022a) based on an investigation of the same cultures SAG 2039 and SAG 2052. In accordance with ICN Principle III and Art. 11.1 (Turland & al. 2018), the name *C. verrucariae* has nomenclatural priority over *R. ramosum*. It is important to note that *C. verrucariae* and *R. ramosum* are based on different types (the former is based on a cryopreserved culture SAG 2052 deposited in the SAG culture collection, Germany, whereas the latter type represents a cryopreserved culture SAG 2052 deposited in the CAUP culture collection, Czech Republic, as the item CAUP J 1701). These names are therefore not homotypic. Consequently, the genus *Rindifilum* is a nomenclaturally valid and legitimate name, typified by the name *R. ramosum*, for which taxonomically the correct name is *C. verrucariae*. If, however, *Rindifilum* and *Ctenocladus* are recognised as distinct genera, a new combination *Rindifilum verrucariae* is required.

Subsequently, Darienko & Pröschold (2022b) proposed to include both *Rindifilum* and *Pseudopleurococcus* in a broadly defined genus *Ctenocladus*, citing the morphological similarity of these genera and genetic variability. However, there is ‘lumper-splitter’ issue here in which we have to choose between a broad or a narrow generic concept (e.g. Krienitz & al. 2001, Buchheim & al. 2005, Luo & al. 2010, Pusztai & al. 2021). Specifically, the family *Ctenocladaceae* includes either four genera as specified above or a single genus *Ctenocladus*. In our opinion, a narrow generic concept is more natural because it corresponds to the historical definition of genera in the *Ulvales* (cf. Škaloud & al. 2018). The morphological differentiation of four *Ctenocladaceae* genera corresponds with phenotypic differences among the other *Ulvales* generic taxa. In particular, unilateral branching and the formation of akinetes terminally on lateral branches represents for us a very distinct morphological feature distinguishing *Ctenocladus* from other genera of the family (Borzi 1883, Škaloud & al. 2018; Fig. 1). The genus *Rindifilum* itself is distinguished on the basis of several morphological characters, including the formation the pear-shaped cells further developing into specific hammer-shaped filaments. Although each of these discriminating traits alone was previously observed in other *Ulvophyceae* genera, their unique combination makes *Rindifilum* distinct from related taxa (Malavasi & al. 2022).

Additionally, the genetic differentiation of *Ctenocladaceae* genera *Rindifilum* and *Pseudopleurococcus* is even higher than that of all other sister genera of the other *Ulvales* families (Fig. 2), including the lichenized genera *Lithotrichon* and *Paulbroadya* recently described by Darienko & Pröschold (2017). Considering all of this, we propose to retain *Rindifilum* as a distinct, well-defined genus, and we here propose the inclusion of *C. verrucariae* in this genus.

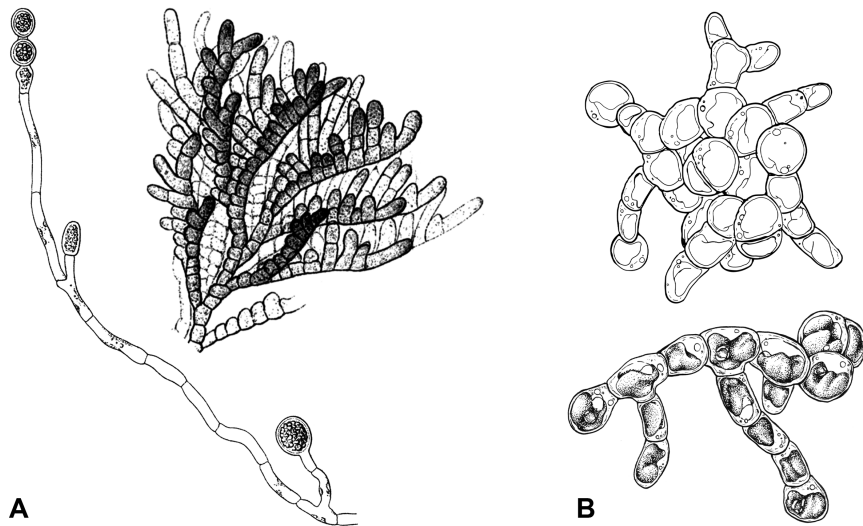
***Rindifilum verrucariae*** (Darienko & Pröschold) Malavasi & Škaloud, *comb. nov.*

Basionym: *Ctenocladus verrucariae* Darienko & Pröschold, *Notulae Algarum* 241: 2, fig. 2.

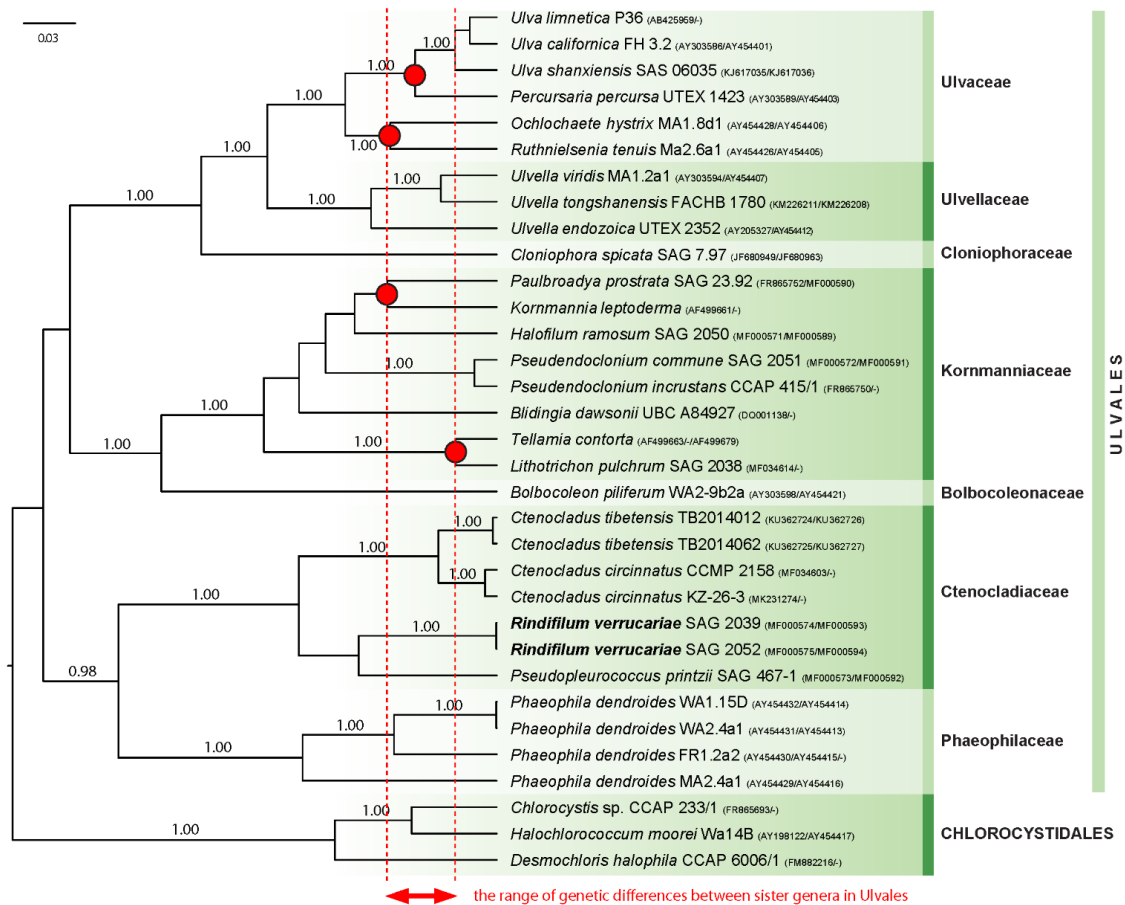
Synonym: *Rindifilum ramosum* Malavasi, Klimešová, Lukešová & Škaloud, *Cryptogamie, Algologie* 43: 129, figs. 2, 3.

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**Fig. 1.** Morphological distinction of genera *Ctenocladus* (A) and *Rindifilum* (B). Note the distinct unilateral branching and the formation of terminal akinetes in *Ctenocladus*. (A after Borzi 1883).



**Fig. 2.** Bayesian ultrametric phylogenetic tree of *Ulvales*, inferred using BEAST, of the concatenated and partitioned SSU rDNA and *tufa* dataset using a GTR+G+I model for all partitions. Values at the nodes indicate Bayesian posterior-node probability (only values higher than 0.97 are shown). GenBank accession numbers for the concatenated SSU rDNA and *tufa* sequences accompany each species name. The nodes marked with red circles represent the most recent common ancestors of sister genera in the families *Ulvaceae* and *Kornmanniaceae*.