



Taxonomic clarification of the dinophyte *Peridinium acuminatum* Ehrenb., ≡ *Scrippsiella acuminata*, *comb. nov.* (Thoracosphaeraceae, Peridinales)

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Abstract

Peridinium acuminatum (Peridinales, Dinophyceae) was described in the first half of the 19th century, but the name has been rarely adopted since then. It was used as type of *Goniodoma*, *Heteraulacus* and *Yesevius*, providing various sources of nomenclatural and taxonomic confusion. Particularly, several early authors emphasised that the organisms investigated by C.G. Ehrenberg and S.F.N.R. von Stein were not conspecific, but did not perform the necessary taxonomic conclusions. The holotype of *P. acuminatum* is an illustration dating back to 1834, which makes the determination of the species ambiguous. We collected, isolated, and cultivated *Scrippsiella acuminata*, *comb. nov.* (strain GeoB 427) from the type locality off Kiel, Germany (Baltic Sea). We barcoded the species of the Thoracosphaeraceae using rRNA sequences and investigated the morphology of the strain using light and electron microscopy. As taxonomic result, we designate an epitype for *Peridinium acuminatum*, as no conflict with C.G. Ehrenberg's protologue can be stated. It is indistinguishable from *Scrippsiella trochoidea* (likewise described from the Kiel Fjord) that we consider a later heterotypic synonym. Our study contributes to the disentanglement of dinophyte taxonomy in a very challenging case, and we trust that C.G. Ehrenberg and S.F.N.R. von Stein investigated different species under the epithet '*acuminatum*'. The complex nomenclature and taxonomy of *Goniodoma*, and its type species *Goniodoma acuminatum*, is discussed in the Electronic Supplement. We consider *Pyrrhotriadinium*, with the type species *Pyrrhotriadinium polyedricum* (Gonyaulacales), well suited to harbour all gonyaulacalean taxa so far assigned to *Goniodoma* and *Heteraulacus* as well.

Key words: calcareous dinoflagellates; epitypification; *Goniodoma*; molecular systematics; morphology; nomenclature; taxonomy

Introduction

Summarised history of *Peridinium acuminatum*:—*Peridinium acuminatum* Ehrenb. (1836: 541, 575, pl. II 5) is among the first 50 species names ever described in the dinophytes. However, the identity of the species is doubtful because of two major historical pitfalls referring to both its taxonomy and its nomenclature. Confusion arose since Stein (1883) introduced monotypic *Goniodoma* F.Stein (1883: 9, 12, 13, 16, 19, 21), which is nomenclaturally based on the name of C.G. Ehrenberg's species. Stein (1883) investigated heterogeneous material from the type locality of *P. acuminatum* in the Kiel Fjord (Germany) and from the Atlantic Ocean as well (see Electronic Supplement for details), but many early authors such as Jørgensen (1899) emphasised the distinctiveness between S.F.N.R. von Stein's species and C.G. Ehrenberg's species. The second (nomenclatural) imprudence was done by Loeblich Jr & Loeblich III. (1966) when they used *P. acuminatum* to designate the type species of *Heteraulacus* Diesing (1850: 9, 100), a name older than *Goniodoma* (delicately citing in their index the same reference for the type of *Goniodoma*). Previous authors were