



Reinvestigation of the type material for *Odontidium hyemale* (Roth) Kützing and related species, with description of four new species in the genus *Odontidium* (Fragilariaceae, Bacillariophyta)

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Abstract

The type materials of *Odontidium hyemale*, *Odontidium anomalum* var. *longissimum* (*longissima*), *Diatoma hiemale* var. *maxima* (*maximum*), *Odontidium anomalum*, and additional materials from the Faroe Islands, Austria, Switzerland, Italy and Macedonia were studied in LM and SEM. The nomenclature of these taxa is explained and original drawings presented. In addition, two new species, *Odontidium rostratum* and *Odontidium apiculatum* are described from Macedonia and Italy. The history and taxonomic changes of *Odontidium* are presented and its separation from *Diatoma* at the genus level explained in more detail.

Key words: *Diatoma*, diversity, morphology, nomenclature, *Odontidium*, springs

Introduction

Reviews and revisions of the genus *Diatoma* Bory (1824: 461) (Williams 1985, Lange-Bertalot *et al.* 1991, Xie & Qi 1997) have been followed with the description of a number of new species (Snoeijs & Potapova 1998, Levkov & Williams 2006, Liu *et al.* 2010). The genus *Odontidium* Kützing (1844: 44), clearly related to *Diatoma* on account of species in both having heavily silicified transapical ribs extending internally from the valve face (referred to, incorrectly, as costae [Cox & Ross 1981, Williams 1985]), was initially distinguished from *Diatoma* by the shape of the colonies: in short ribbons in *Odontidium*, in a zig-zag arrangement in *Diatoma* (Kützing 1844: 44). Van Heurck (1896: 348, 350) regarded *Diatoma* and *Odontidium* as subgenera of *Diatoma* noting colony structure and transapical ribs structure differences; *Odontidium* was defined by “Frustules united in short filaments [colonies]; costae [transapical ribs] very robust” (Van Heurck 1896: 350); *Diatoma* was defined by “Filaments [colonies] in zig-zag; costae [transapical ribs] rather delicate” (Van Heurck 1896: 348). Van Heurck included *Diatoma hyemale* (Roth 1800a: 506) Heiberg (1863: 58) and *Diatoma anceps* (Ehrenberg 1843a: 415) Kirchner (1878: 204) in the subgenus *Odontidium*, adding the variety *Diatoma anceps* var. *anomala* (*anomalum*) (W. Smith) Van Heurck (1896: 350).

In spite of the known distinctions between *Odontidium* and *Diatoma*, the name *Diatoma* continues to be used in many widely used floras and checklists for taxa that should rightly be placed in *Odontidium* (e.g. Krammer &