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**The phylum name Bacillariophyta and other names of phyla used to include the diatoms**

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The phylum name Bacillariophyta is often employed by authors without nomenclatural authorities. *Index Nominum Algarum (INA)* refers to Dillon (1963: 81), in which publication it was introduced as ‘Province C. Bacillariophyta’ of ‘Subkingdom XIV. Chrysophytaria’ of the Kingdom Plantae. Although not indicated as a new name [an asterisk designating it as new is absent; Dillon (1963: 76)], a common name (‘the diatoms’) and a description in English was provided, but the Latin description required by Art. 44 (Melbourne Code, McNeill *et al.* 2012) was absent. *INA* also lists Whittaker & Margulis (1978: 12, table 2, ‘Phylum Bacillariophyta, diatoms’) as a *nomen*, meaning that no description was provided. Round, Crawford & Mann (1990: 125) further employed ‘Division Bacillariophyta’. Medlin, Williams & Sims (1993, ‘Bacillariophyta’) also employed the name without authorities.

The name Bacillariophyta appears to have had its origin in the class name Bacillariophyceae introduced by Haeckel (1878: 95, ‘*Neunte Klasse des Protistenreiches Bacillariae*’), which, according to Silva (1980: 19), is a typified name based on *Bacillaria* J.F.Gmelin (Gmelin 1791: 3903). The earliest nomenclaturally valid use of the name Bacillariophyta appears to be that of Karsten (1928: [105], ‘*Abteilung [Division] Bacillariophyta (Diatomeae)*’, and here is provided with an extensive German description; there is also a clear indication of rank. While there is no direct statement, as is the case for ‘Klasse Bacillariae’ Haeckel, this name also appears to be based on the genus *Bacillaria* J.F.Gmelin, and thus Bacillariophyta Karsten should be regarded as a *nomen typificatum*. The use of the name Bacillariophyta as a division or phylum was quickly followed by Hustedt (1930: [1]) and many others thereafter.

Priority is not imposed above the familial level (Art. 11, Melbourne Code, McNeill *et al.* 2012, but see Rec. 16A, where it is *recommended*), and the application of names to a phylum that includes the diatoms is a matter of choice for taxonomists, but the name used must be nomenclaturally valid. While Art. 16.3 (Melbourne Code, McNeill *et al.* 2012) specified the ending ‘-phygota’ for automatically typified names of divisions or phyla, this requirement was removed at the XIXth International Botanical Congress, Shenzhen, China, July 2017.

Shameel (2008: 227) introduced the phylum name ‘Bacillariophycota’, as a phylum of Protista for diatoms, following Art. 16.3. Shameel, seemingly, was not aware that Art. 16.3 applied only to automatically typified names, and many of the names he introduced are not automatically typified names, such as Rhodophycota and Phaeophycota, and are not permitted by Art. 16.3. Shameel’s intention was to provide ‘-phygota’ replacements for all algal names with the ending ‘-phyta’. The removal of the requirement to use the termination ‘-phygota’ for typified phyla names now means that ‘-phyta’ may be used as previously done and as required. It is not clear if Shameel’s names were validated by reference to the ‘-phyta’ phyla he included, but the Latin descriptions required by Art. 44 (Melbourne Code, McNeill *et al.* 2012) were not provided.

In recent years, most diatomists employ the phylum name Bacillariophyta for diatoms; however, some still prefer not to employ a phylum name solely for diatoms, preferring to include the diatoms in the phylum “Heterokontophyta” (or in the phylum Ochrophyta) with the diatoms in a single class Bacillariophyceae that includes a number of subclasses. The descriptive name “Heterokontophyta” was introduced by Hoek (1978: 12, 79) and Moestrup (1992: 4) and included the diatoms amongst other heterokont algae; however, “Heterokontophyta” is an invalid name as a Latin description or diagnosis was not provided by either author, as required by Art. 44.1 (Melbourne Code, McNeill *et al.* 2012). The descriptive name Heterokonta Cavalier-Smith (1986: 338, ‘*Divisio Heterokonta*’, a

phylum of Kingdom Chromista) is, however, a valid name that does not permit alteration to “Heterokontophyta” [see Art. 16.1(b), Melbourne Code, McNeill *et al.* 2012]. The phylum name Ochrophyta Cavalier-Smith (in Cavalier-Smith & Chao 1996: 508), used by some authors in place of Heterokonta or Heterokontophyta, was named as a phylum of superphylum Gyrista and was validated by reference to the diagnosis for Ochrista Cavalier-Smith, validly introduced by Cavalier-Smith (1986: 339, ‘subdivisio Ochrista’): “Phylum Ochrophyta orthog. mut. pro phylum Ochrista Cavalier-Smith (1995b) is a non-typified descriptive name referring to the ochrous colour of the majority of members of the phylum”, and was not intended to be typified by *Ochromonas Vysotskii* [Wysotzki, Wyssotzki], 1887, as assumed by some authors.

The use of a particular phylum or superphylum name for diatoms (or to include diatoms) is a taxonomic decision. All that I have endeavoured to do here is to clarify the valid use of the automatically typified phylum name Bacillariophyta for authors who wish to use such a phylum name exclusively for diatoms and to point out the validity or otherwise of other phyla names that are said to include the diatoms.

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