

(049) Proposal to modify Article 16.3

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The algae are an artificial group of prokaryotic and eukaryotic organisms, in general photosynthetic, that do not have true embryos, which are one of the diagnostic features of land plants (Graham & al., *Algae*, ed. 2: 616. 2009). This heterogeneity has been hypothesized for quite some time through morphology and biochemistry, and has been more convincingly established with the advances of molecular systematics. Thus, algae are a group with representatives originating at different times through, sometimes, different processes of endosymbiosis and, consequently, segregating into different clades (Archibald in *Curr. Biol.* 19: 81–88. 2009); one of these processes having culminated in the origin of the land plants (Wodniok & al. in *B. M. C. Evol. Biol.* 11: 104. 2011). Despite the multiple origins and the variability of circumscription among several authors, the term algae has continued to be used, at least for the group not including the *Cyanobacteria*. Although the groups traditionally treated as algae, including blue-green algae (*Cyanobacteria*), are without a clear definition, their nomenclature is governed by the *ICN* (McNeill & al. in *Regnum Veg.* 154. 2012).

Article 16.3 of the *ICN* establishes that the termination of names of a phylum or division and a subphylum or subdivision referable for algae should be *-phycota* and *-phycotina*, respectively. However, earlier classifications of algae adopted the termination *-phyta* for the former (e.g., Engler, *Syllabus*, ed. 3: 233. 1903; Pascher in *Beih. Bot. Centralbl.*, Abt. 2, 48: 317–332. 1931), an ending that, under Art. 16.3, should be exclusively applied to groups of plants. Nowadays, in the major classifications of algae, we still do not observe the use of the endings required by the *ICN*, either intentionally or because of errors. Thereby, the use of the terminations *-phyta* and *-phytina* is common also for algae, even in groups not closely related to land plants (e.g., *Bacillariophyta*, *Dinophyta*, *Haptophyta*, *Heterokontophyta*, etc.), in both more general and the more specific classifications (Round, *Biol. Algae*, ed. 2: 269. 1973; Round & al., *Diatoms*: 747. 1990; Van den Hoek & al., *Algae*: 623. 1995; Medlin & Kaczmarska in *Phycologia* 43: 245–270. 2004; Lee, *Phycology*, ed. 4: 547. 2008). Rare studies and online checklists of algae have applied to names of divisions the endings as ruled by the *ICN* (e.g., Silva & al., *Cat. Benthic Mar. Algae Ind. Ocean*: 1259. 1996). On the other hand, the endings *-phyceae* and *-phycidae* for class and subclass, respectively, as established in Art. 16.3, have for a long time been used for algae (Silva in *Regnum Veg.* 103. 1980), whereas *-opsida* and *-idae* are, respectively, applied for these same ranks for plants.

Herein, the delimitation of taxa of algae at divisional or subdivisional level is not a point of discussion nor are the correct names to be adopted, but just the endings of these names. It is clear that the use of the endings for division and subdivision, as ruled by Art. 16.3 of *ICN*, depends of the circumscription of the main groups contemplated by the *ICN* (i.e., algae, fungi, and plants). Fungi are treated as a monophyletic and, therefore, a natural group, and there

would not be problems in the application of the endings *-mycota* or *-mycotina* for the component taxa (e.g., *Ascomycota*, *Basidiomycota*, *Blastocladiomycota*, or *Chytridiomycota*; Hibbett & al. in *Mycol. Res.* 111: 509–547. 2007). For plants and algae, the delimitation is more delicate because there are taxa that transit through these two groups according to different authors, such as *Chlorophyta*, *Glaucophyta*, and *Rhodophyta* (Cavalier-Smith in *Proc. Roy. Soc. London, Ser. B, Biol. Sci.* 271: 1251–1262. 2004; Judd & al., *Sist. Veg.*, ed. 3: 632. 2009).

Thus, the practice ruled by Art. 16.3 concerning different terminations for names of divisions and subdivisions of algae and plants has not been adopted and, probably, this is due the volatility of the definition of algae. Article 16.3 establishes that endings of names at these ranks that do not agree with the rule should be corrected. However, adoption of *-phyta* and *-phytina* for algae as well as for plants is not confined to the published classifications but also applies to the wide and predominant use of these classifications with their equivocal terminations in several floristic and taxonomic studies.

In order to maintain nomenclatural stability, it is proposed here to modify Art. 16.3, requiring the use of the endings *-phyta* and *-phytina* for divisions/phyla and subdivisions/subphyla, respectively, of algae as well as of plants. These changes would not affect the current taxonomy of groups traditionally treated as algae, including *Cyanobacteria*, but would regulate a practice that for a long time has not agreed with Art. 16.3 of the *ICN*.

(049) Amend Art. 16.3 as follows (deleted text in strikethrough):

“16.3. Automatically typified names end as follows: the name of a division or phylum ends in *-phyta*, unless it is referable to the ~~algae or~~ fungi in which case it ends in ~~-phycota or -mycota, respectively~~; the name of a subdivision or subphylum ends in *-phytina*, unless it is referable to the ~~algae or~~ fungi in which case it ends in ~~-phycotina or -mycotina, respectively~~; the name of a class in the algae ends in *-phyceae*, and of a subclass in *-phycidae*; the name of a class in the fungi ends in *-mycetes*, and of a subclass in *-mycetidae*; the name of a class in the plants ends in *-opsida*, and of a subclass in *-idae* (but not *-viridae*). Automatically typified names not in accordance with these terminations or those in Art. 17.1 are to be corrected, without change of the author citation or date of publication (see Art. 32.2). However, if such names are published with a non-Latin termination they are not validly published.”

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