Torularia Bonnnemaison, 1828, a generic name to be reinstated for *Atrophycus* Necchi & Rossignolo, 2017

Michael J. Wynne, University of Michigan Herbarium, Ann Arbor, Michigan 48108, USA
(correspondence: mwynne@umich.edu)

When Bonnemaison (1828: 97) described the new red algal genus *Torularia*, he assigned to this genus three species without indicating a generitype. Two of them, *T. fragilis* Bonnemaison and *T. lenta* Bonnemaison, were both illegitimate because these binomials were initially superfluous as available, valid and legitimate names were cited by Bonnemaison in their synonymies. For *Torularia fragilis*, *Lemanea sertularina* Bory (1808) and *Chantransia dichotoma* De Candolle (in Lamarck & De Candolle 1806) [a correction of *Chantransia "bichotoma"* De Candolle (in Lamarck & De Candolle 1805)] were cited as synonyms. Of these, the name with priority is *Chantransia dichotoma* De Candolle. For *T. lenta*, "*Conferva atra* Roth" (= *Conferva atra* Hudson, 1778), *Chantransia atra* De Candolle (in Lamarck & De Candolle 1805), and *Lemanea batrachospermosa* Bory (1808) were cited as taxonomic synonyms. The name with priority of these is *Conferva atra* Hudson.

For the third species, *Torularia dillenii*, Bonnemaison cited as taxonomic synonyms *Lemanea dillenii* Bory (1808) (to be considered as its basionym) and "*Conferva fontana, nodosa, etc. Dillen. Tab. 7, f. 46*" (Dillenius, 1741), which can be disregarded as a pre-Linnaean name. *Torularia dillenii* (Bory) Bonnemaison is therefore legitimate, and as such, it is here designated as lectotype of the generic name *Torularia* Bonnemaison, 1828.

Although there was a proposal by Basak & Mishra (1982) to conserve the later generic name *Torularia* (Cosson) O.E.Schulz (1924), a genus of *Brassicaceae*, that proposal received "no support" (Brummitt, 1985), and consequently J.Léonard (1986) proposed *Neotorularia* I.C.Hedge & J.Léonard as a substitute name for *Torularia* (Cosson) O.E.Schulz.

Torularia Bonnemaison has long been treated as congeneric with *Batrachospermum* Roth (e.g., Kützing 1849; Crouan & Crouan, 1867; Sirodot, 1884; Schmitz, 1889; De Toni, 1897; Kylin, 1956; Skuja in Farr et al., 1979; Schneider & Wynne, 2007; Athanasiadis, 2016). In recent years, however, the utilization of gene-sequencing analyses has indicated a need for the recognition of a number of segregate genera that had formerly been treated as Sections within *Batrachospermum*. Necchi & Entwisle (1990) recognized ten such Sections of *Batrachospermum*. One of their sections was "*Setacea* Sirodot", with *Batrachospermum atrum* (Hudson) Harvey listed as a "Representative species". Sirodot (1884: 253) introduced the term "Section Sétacés", but that French orthography is not acceptable as a valid name (ICN Art. 16.3). De Toni (1897: 57) has been credited with authorship of Section *Setacea* of *Batrachospermum*. Entwisle (1992) reviewed various "setaceous species" of *Batrachospermum*, including *B. atrum* and *B. puiggarianum* Grunow, and described the new species *B. diatyches* Entwisle. Entwisle & Foard (1998) referred to the "Section *Setacea/B. atrum* complex". In a paper that expanded the circumscription of *Nothocladus* Skuja, Entwisle & Vis (in Entwisle *et al*. 2016) transferred some species of the Ssection *Setacea* of *Batrachospermum* to *Nothocladus*. This included the transfers of *B. atrum* and *B. puiggarianum* into *Nothocladus* as *N. ater* (Hudson) Entwisle & M.L.Vis and *N. puiggarianus* (Grunow) Entwisle & M.L.Vis, respectively, while *B. diatyches* was transferred also to *Nothocladus* as *N. diatyches* (Entwisle) Entwisle & M.L.Vis but into the new section *Theaquus* Entwisle & M.L.Vis.

In a revision of *Batrachospermum*, Rossignolo & Necchi (2016) raised Section *Setacea* to generic level. The use of a Latin technical tern as a generic name, however, is contrary to ICN Art. 20.2 (Turland *et al*., 2018). In a follow-up paper, Rossignolo *et al*. (2017) proposed the name *Atrophycus* to serve for segregate clade of *Batrachospermum* while recognizing it at the genus level and designating as lectotype species *Atrophycus ater* (Hudson) Necchi & Rossignolo. According to

Rossignolo & Necchi (2016), the only diagnostic character to serve to distinguish the species within *Atrophycus* is the arrangement of whorls and primary fascicles.

At present, three species of *Atrophycus* are recognized (Rossignolo *et al*., 2017): *A. ater* (Hudson) Necchi & Rossignolo, *A. puiggarianus* (Grunow) Necchi & Rossignolo, and *A. atrobrasiliensis* Necchi & Rossignolo [see below concerning the authorship].

Following the synonymy proposed by Kumano (2002) and accepted by Athanasiadis (2016: 190), *Lemanea dillenii* Bory is a taxonomic synonym of *Batrachospermum atrum* (Hudson) Harvey. Consequently, *Lemanea dillenii* (basionym of the type species of the genus *Torularia*) is a heterotypic synonym of *Conferva atra* Hudson (basionym of the type species of the genus *Atrophycus*). Therefore, because the type species of both *Torularia* and *Atrophycus* are referable to the same species (*Conferva atra*), *Torularia* and *Atrophycus* are congeneric.

Because of the priority of *Torularia* Bonnemaison (1828), the following new combinations are here proposed for species previously combined under *Atrophycus*:

Torularia atra (Hudson) M.J.Wynne, *comb. nov.*
Basionym: *Conferva atra* Hudson, *Fl. Angl*. ed. 2: 597, 1778.
Homotypic synonyms:
Batrachospermum atrum (Hudson) Harvey 1841: 120.
Nothocladus ater (Hudson) Entwisle & M.L.Vis in Entwisle *et al*. 2016: 391.
Setacea atra (Hudson) Necchi & Rossignolo (2016) *inval.* on the basis of Art. 35.1 of the Code (Turland et al. 2018).
Atrophycus ater (Hudson) Necchi & Rossignolo in Rossignolo, Necchi & Guiry, *Notulae algarum* No. 26: 1 (2017).
Heterotypic synonyms:
Batrachosperum dillenii (Bory) Duby 1830: 978.
Lemanea dillenii Bory 1808: 187, pl. 22: fig. 2.
Torularia dillenii (Bory) Bonnemaison 1828: 99.
Batrachospermum gallaei Sirodot 1884: 256.
See Kumano (2002) for additional synonyms.

Torularia puiggariana (Grunow) M.J.Wynne, *comb. nov.*
Basionym: *Batrachospermum puiggarianum* Grunow in Wittrock & Nordstedt, *Algae Exsicc*. 11: 1, No. 501, 1883.
Homotypic synonyms:
Nothocladus puiggarianus (Grunow) Entwisle & M.L.Vis in Entwisle *et al.* 2016: 392.
Atrophycus puiggariana (Grunow) Necchi & Rossignolo in Rossignolo, Necchi & Guiry, *Notulae algarum* 26: 1, 2017.
Setacea puiggariana (Grunow) Necchi & Rossignolo, 2016, *inval.* (ICN Art. 35.1).

Necchi & Rossignolo (in Rossignolo *et al*. 2017) proposed *Atrophycus atrobrasiliensis* ("*atro-brasiliensis*") as a new combination of "*Setacea atrobrasiliensis*" ('*atro-brasiliensis*') Necchi & Rossignolo (in Rossignolo & Necchi 2016). According to Art. 35.1 of the ICN (Turland et al., 2018) "*Setacea atrobrasiliensis*" is invalid, so the intended combination proposed by Necchi & Rossignolo is also invalid. In *Index Nominum Algarum* (14 January, 2019), *Atrophycus atrobrasiliensis* is considered as the name of a new species validated by Necchi & Rossignolo (in Rossignolo *et al*. 2017) by reference to "*Phycologia* 55(4): 343, figs 5, 8, 11, 14, 17, 2016". However, taking into account that no Articles of the ICN provide for the possibility of treating as a new name a combination based on an invalid name, if we considered *A. atrobrasiliensis* as a new species, such a name is also invalid as neither the requirements of ICN Art. 40.6 nor those of ICN Art. 40.7 were fulfilled as a holotype was not indicated nor its place of conservation for this name.

Therefore, the following new species is described:

Torularia atrobrasiliensis M.J.Wynne *sp. nov.*
Description: as for *Setacea atrobrasiliensis* (‘*atro-brasiliensis’*) *inval*. in Rossignolo & Necchi, 2016, *Phycologia* 55(4): 343, 345, figs 5, 8, 11, 14, 17.
Holotype: Brazil, São Paulo State, Pindamonhangaba, 9 km from entrance of Campos do Jordão State Park, road to ‘Mirante’, 22°43’21”S, 45°27’13”W, altitude 1865 m; O. Necchi, Jr., 22 May 2008; deposited in **SJRP** 31461.

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