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Addendum to the Synoptic Review of Red Algal Genera

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Review

Addendum to the synoptic review of red algal genera

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Abstract

An addendum to Schneider and Wynne's *A synoptic review of the classification of red algal genera a half century after Kylin's ''Die Gattungen der Rhodophyceen''* (2007; *Bot. Mar. 50:* 197–249) is presented, with an updating of names of new taxa at the generic level and higher. In the last few years, the names of several new orders and families of red algae have been validated; these are cited and referenced below.

Keywords: classification; genera; Kylin; red algae; Rhodoplantae.

Introduction

With the current accelerated pace of publications using gene-sequencing and the resulting construction of phylogenetic trees, more strongly justified inferences of taxonomic/evolutionary relationships are being made for red algae than were possible beforehand based on morphological data alone. As a result, many new taxa are being recognized at all taxonomic levels. A substantial number of supra-ordinal taxa has been proposed in the last few years. Continued exploration of red-algal habitats, especially at great depths and in remote regions, has revealed several new genera of particularly diminutive microscopic species. Furthermore, molecular-based phylogenies often have shown the need to recognize segregate entities, at times necessitating the description of entirely new genera or the re-instatement of older generic names that had come to be treated as taxonomic synonyms by classical morphologists. Since the publication of Schneider and Wynne's (2007) *A synoptic review of the classification of red algal genera a half century after Kylin's ''Die Gattungen der Rhodophyceen''*, much new work has appeared, leading us to supplement the previous compilation with this addendum. We have also recognized that we had overlooked some obscure valid names in the earlier publication, whereas other omissions were kindly pointed out by colleagues. Therefore, we take this opportunity to document necessary changes. We plan to provide further addenda periodically as sufficient new published information appears.

Format of the list

The format employed in the previous synoptic review (Schneider and Wynne 2007) is followed in this addendum. The References section contains the literature cited for all genera since 1956 as well as earlier works not covered by Kylin (1956). If a genus were treated in Kylin (1956), bibliographic references are not given here. If, however, an early paper is cited in a note or endnote, full attribution is given in the References.

List of genera

Kingdom Plantae
Subkingdom Rhodoplantae
Phylum Cyanidiophyta
Class Cyanidiophyceae
Order Cyanidiales
Family Cyanidiaceae
Cyanidium Geitler 1933: 624.
Synonym: *Pluto* J.J. Copeland (1936).
Note: The name *Pluto*, originally regarded as a genus of Cyanophyceae (Smith 1950), was not listed in Kylin (1956) nor in Schneider and Wynne (2007). The generitype of *Pluto*, *P. caldarius* (Tilden) J.J. Copeland, was based on the same basionym as Geitler's *Cyanidium caldarium* (Tilden) Geitler, namely, *Protococcus botryoides* f. *caldarius* Tilden (1898) described from the bottom of a hot spring (temperature, 38°C) in Yellowstone National Park, USA. Thus, the names are homotypic synonyms, Geitler's generic name having priority.

Order Cyanidioschyzonales F.D. Ott (2009)
Family Cyanidioschyzonaceae F.D. Ott (2009)
Note: Ott (2009) established this above order and family to accommodate the single genus *Cyanidioschyzon* De Luca et al. (1978).

Phylum Rhodophyta
Subphylum Rhodellophytina
Class Rhodellophyceae
Order Dixoniellales
Note: This new order was established by Yokoyama et al. (2009).

Family Glaucosphaeraceae
Synonym: Dixoniellaceae.
Note: The family Dixoniellaceae was established by Yokoyama et al. (2009) to include three genera: *Dixoniella*, *Glaucosphaera* and *Neorhodella*. However, the family name Glaucosphaeraceae (Skuja 1954) has priority over Dixoniellaceae and is the name to be used in accordance with Art. 11.3 of the ICBN (McNeill et al. 2006).

***Neorhodella* J.L. Scott, A. Yokoyama, C. Billard, J. Fresnel *et* J.A. West in Scott et al. 2008: 561.**
Note: The name of the generitype, *Neorhodella cyanea* (Billard et Fresnel) J.L. Scott, A. Yokoyama, Y. Hara *et* J.A. West, was validated in a subsequent corrigendum (Scott et al. 2009).

Order Rhodellales
Family Rhodellaceae
***Corynoplastis* A. Yokoyama, J.L. Scott, G. Zuccarello, M. Kajikawa, Y. Hara *et* J.A. West 2009: 284.**
Note: This monotypic new genus was established on the basis of *Corynoplastis japonica,* with a type locality of Tateiwa, Tobishima Island, Sakata-shi, Yamagata, Japan.

Class Stylonematophyceae
Order Rufusiales
Note: This order was established by Zuccarello and West in Zuccarello et al. (2008).

Family Rufusiaceae
Note: This family was established by Zuccarello and West in Zuccarello et al. (2008) to include the single genus *Rufusia*.

Order Stylonematales
Synonym: Chrootheceales F.D. Ott (2009).
Note: Ott (2009) established the new order Chrootheceales (and family Chrootheceaceae) for the two genera *Chroothece* and *Chroodactylon*. Yoon et al. (2006), however, have already provided molecular evidence demonstrating a close relationship of this pair of genera with *Stylonema* and other genera that they assigned to their new class Stylonematophyceae. Earlier, this assemblage had been referred to as ''Porphyridiales 2'' by Müller et al. (2001) and Saunders and Hommersand (2004). The names of the order Stylonematales and the family Stylonemataceae were previously validated by Drew (1956) to accommodate these genera.

Family Stylonemataceae
Synonym: Chrootheceaceae F.D. Ott (2009).
Note: See above.

Chroothece Hansgirg in Wittrock and Nordstedt 1884: 696.
Synonym: *Zachariasia* Lemmermann (1895).
Note: Schneider and Wynne (2007) assigned *Zachariasia* to the Bangiaceae in agreement with the opinions of Geitler (1942), Drouet and Daily (1956) and others. The genus was originally thought to belong to the cyanophycean family Chroococcaceae (Lemmermann 1895). Ott (2009) discussed the history of the various treatments of *Zachariasia* and concluded by transferring the type species, *Z. endophytica*, into *Chroothece*.

Class Porphyridiophyceae
Order Porphyridiales
Family Porphyridiaceae
Erythrolobus J.L. Scott, B. Baca, F.D. Ott *et* J.A. West 2006: 408.
Note: This name was misspelled as ''*Erythrobolus*'' in our previous synoptic review (Schneider and Wynne 2007).

Subphylum Metarhodophytina
Class Compsopogonophyceae
Order Erythropeltidales
Family Erythrotrichaceae
***Madagascaria* J.A. West *et* N. Kikuchi in Zuccarello et al. 2010: 370.**
Note: This monotypic genus was based on *Madagascaria erythrocladioides* J.A. West *et* N. Kikuchi in Zuccarello et al. (2010) from the intertidal of Ampasi Pohry, Nossi Be, Madagascar.

***Pseudoerythrocladia* J.A. West *et* G.C. Zuccarello in Zuccarello et al. 2010: 369.**
Note: This monotypic genus was based on *Pseudoerythrocladia kornmannii* J.A. West *et* G.C. Zuccarello (in Zuccarello et al. 2010) from the intertidal of Le Caro, Brittany, France.

Smithora Hollenberg 1959: 3.
Synonym: *Membranella* Hollenberg *et* I.A. Abbott (1968).
Note: West and Zuccarello (2009) offered evidence to treat *Membranella* as a taxonomic synonym of *Smithora.*

Subphylum Eurhodophytina
Class Bangiophyceae
Order Bangiales
Family Bangiaceae
Bangia Lyngbye 1819: 82.
Synonym: ***Bangiadulcis* W.A. Nelson 2007: 885.**
Note: This genus was recognized by Nelson (2007) and based on the type *Bangiadulcis atropurpurea* (Roth) W.A. Nelson, a species found in freshwater. Silva and Nelson (2008), however, found that because *Bangia* had been lectotypified by Pfeiffer (1871–1873) with *Conferva atropurpurea* Mertens *ex* Roth, *Bangiadulcis* became a superfluous name for *Bangia.* At the present stage, either the name *Bangiadulcis* needs to be conserved or another taxonomic decision reached (Silva and Nelson 2008). Lynch et al. (2008) found no morphological differences between *Bangia* and *Bangiadulcis*, thus finding the generic distinction between freshwater and salt-water species premature. Future studies involving molecular analyses were suggested by Silva and Nelson (2008) as a means to determine the circumscription of the genus that would include *B. fuscopurpurea.*

Porphyra C. Agardh 1824: xxxii, 190 *nom. cons.*
Synonym: *Pyropia* J. Agardh (1899).
Note: *Pyropia* was not listed in Kylin (1956) and was inadvertently omitted by Schneider and Wynne (2007). This genus was based on *Pyropia californica* J. Agardh (1899), a name treated by Kylin (1941) as conspecific with *Porphrya nereocystis* C.L. Anderson in Blankinship and Keeler (1892).

Class Florideophyceae
Subclass Hildenbrandiophycidae
Order Hildenbrandiales
Family Hildenbrandiaeae
Hildenbrandia Nardo 1834: 676 [''*Hildenbrandtia*''] *nom. et orth. cons*.
Note: *Pleurocapsa cuprea* Hansgirg, which had been originally described as a cyanophycean taxon, was recognized as a species of *Hildenbrandia* and transferred to that genus as *H. cuprea* (Hansgirg) Caisová *et* Kopecky by Caisová and Kopecky (2008).

Subclass Nemaliophycidae
Order Acrochaetiales
Family Acrochaetiaceae
Acrochaetium Nägeli in Nägeli and Cramer 1858: 532.
Synonym: *Rhodochortonopsis* Yamada (1944).
Note: In our previous synoptic review (Schneider and Wynne 2007), *Rhodochortonopsis* was assigned to the category of ''Genera incertae sedis''. Kitayama (2009) re-examined type specimens of *R. spongicola* Yamada, the type and only species of the genus, and observed that the ''stichidia'', that were thought by Yamada (1944) to distinguish this genus, were actually an artifact, resulting from a covering of spongy spicules, and that this alga was the same as *Acrochaetium spongicola* Weber Bosse (Weber-van Bosse 1921).

Grania (Rosenvinge) Kylin 1944: 26.
Note: Previously, *Grania* had been treated as a later taxonomic synonym of *Acrochaetium*. Clayden and Saunders (2008), however, provided solid molecular evidence for the recognition of *Grania* as a distinct genus.

Order Batrachospermales
Family Batrachospermaceae
Kumanoa **T.J. Entwisle, M.L. Vis, W.B. Chiasson, O. Necchi *et* A.R. Sherwood 2009: 709.**
Note: Entwisle et al. (2009) established *Kumanoa*, based on the type species *K. virgato-decaisneana* (Sirodot) Entwisle, M.L. Vis, W.B. Chiasson, Nechhi *et* A.R. Sherwood from France, as a segregate genus out of *Batrachospermum*.

Order Nemaliales
Family Liagoraceae
Nemalion Duby 1830: 959.
Synonym: *Boanema* Ercegović (1927).
Note: In Geitler's (1942) opinion, *Boanema*, which was described from the island of Ciovo, Croatia (Adriatic Sea) as a cyanophycean genus assigned to the new family Boanemataceae in the order Stigonematales, is a developmental stage of *Nemalion*.

Family Galaxauraceae
Dichotomaria Lamarck 1826: 143.
Synonym: *Alysium* C. Agardh (1823).
Note: Wynne (2008) demonstrated that the generitype of *Alysium*, *A. holtingii* C. Agardh from Rio de Janeiro, Brazil, is a later taxonomic synonym of *Dichotomaria obtusata* (J. Ellis *et* Solander) Lamarck.

Order Rhodachlyales
Family Rhodachlyaceae
Rhodachlya **J.A. West, J.L. Scott, K.A. West, U. Karsten, S.L. Clayden *et* G.W. Saunders 2008: 205.**
Note: When West et al. (2008) described the monotypic genus *Rhodachlya* based on *R. madagascariensis* J.A. West, J.L. Scott, K.A. West, U. Karsten, S.L. Clayden *et* G.W. Saunders from near Iftay, Madagascar, they also established a new family and order for it.

Order Palmariales
Family Meiodiscaceae
Note: This family was described by Clayden and Saunders (2010) and assigned to the Palmariales. The species *Meiodiscus spetsbergensis* (Kjellman) G.W. Saunders *et* McLachlan, *Meiodiscus concrescens* (K.M. Baker) P.W. Gabrielson, and, tentatively, *Rubrointrusa membranacea* (Magnus) S.C. Clayden *et* G.W. Saunders were assigned to the new family.

Rubrointrusa **S.L. Clayden *et* G.W. Saunders 2010: 296.**
Note: This genus was delineated by Clayden and Saunders (2010) with the type species *Rubrointrusa membranacea* (Magnus) S.L. Clayden *et* G.W. Saunders, originally described from near Haddock Bank in the North Sea.

Family Rhodophysemataceae
Rhodophysema Batters 1900: 377.
Synonym: *Halosacciocolax* S. Lund (1959).
Note: By their transfer of *Halosacciocolax kjellmanni* S. Lund, the type species of the genus, to *Rhodophysema*, Clayden and Saunders (2010) effected the merger of the former genus with the latter.

Rhodonematella **S.L. Clayden *et* G.W. Saunders 2010: 297.**
Note: This genus was delineated by Clayden and Saunders (2010) with the type species *Rhodonematella subimmersa* (Setchell *et* N.L. Gardner) S.L. Clayden *et* G.W. Saunders, originally described from Whidbey Island, Washington, USA. The genus was tentatively assigned to this family by Clayden and Saunders (2010).

Subclass Corallinophycidae
Order Sporolithales
Note: The ordinal name Sporolithales was validated by Le Gall and Saunders in Le Gall et al. (2010). Members of the

new order differ from the two other orders of the subclass Corallinophycidae (namely, the Corallinales and the Rhodogorgonales) in producing tetrasporangia within calcified sporangial compartments and in having cruciately divided tetrasporangia.

Family Sporolithaceae

Note: This family name was established by Verheij (1993), using the absence of tetrasporangial conceptacles as a family characteristic. His diagnosis of the family was emended by Le Gall et al. (2010) to include the pattern of tetrasporangial development as outlined by Townsend et al. (1995, pp. 89–90).

Order Corallinales
Family Corallinaceae
Subfamily Corallinoideae

Bossiella P.C. Silva 1956: 46.

Note: In proposing that *Bossiella* and *Pachyarthron* are congeneric, Johansen (1969) used *Bossiella*, the junior name. Schneider and Wynne (2007) reinstated *Pachyarthron*, the name with priority. Subsequently, Woelkerling et al. (2008) offered evidence to treat these two genera as distinct from one another, *Pachyarthron* (with *P. cretacea* as lectotype species) having male conceptacles produced axially at branch tips and laterally on intergenicula and *Bossiella* having only lateral conceptacles.

Jania J.V. Lamouroux 1812: 186.

Synonyms: *Cheilosporum* (Decaisne) Zanardini (1844); *Haliptilon* (Decaisne) J. Lindley (1846).

Note: Kim et al. (2007) offered evidence to treat *Cheilosporum* and *Haliptilon* as taxonomic synonyms of *Jania*.

Pachyarthron Manza 1937: 45.

Note: See note under *Bossiella*.

Paulsilvella **Woelkerling, Sartoni *et* Boddi 2002: 359.**

Note: The type species of the genus, *Paulsilvella huveorum* Woelkerling, Sartoni *et* Boddi, is presently known from Somalia and Kenya, whereas the only other species, *P. antiqua* (G.F. Elliott) Woelkerling, Sartoni *et* Boddi, is a Late Pleistocene fossil from Mauritius.

Rhizolamiella **Shevejko 1982: 26–28.**

Note: This monotypic genus was based on *Rhizolamellia collum* Shevejko, with its type locality Scott Reef (at 17–27 m depth), Western Australia. It was recently re-discovered and depicted by Huisman et al. (2009).

Family Hapalidiaceae
Subfamily Choreonematoideae

Choreonema F. Schmitz 1889: 455.

Synonym: *Endosiphonia* Ardissone (1883), *nom. illeg.*

Note: *Endosiphonia* Ardissone *nom. illeg*., a later homonym of *Endosiphonia* Zanardini (1878), was omitted in the previous red algal synoptic review (Schneider and Wynne 2007). Schmitz' name *Choreonema* was a *nom. nov*. to replace Ardissone's *Endosiphonia*.

Subfamily Melobesioideae

Mesophyllum Me. Lemoine 1928: 251.

Synonym: *Stereophyllum* Heydrich (1904), *nom. illeg.*

Note: Schneider and Wynne (2007) placed *Stereophyllum*, based on *S. expansum* (Phillipi) Heydrich in taxonomic synonymy with *Lithophyllum*. Woelkerling (1983) assigned *Stereophyllum* as congeneric with *Mesophyllum*, regarding *S. expansum* as a heterotypic synonym of *M. lichenoides* (J. Ellis) Me. Lemoine. Cabioch and Mendoza (2003) likewise concluded that *Stereophyllum* should be regarded as congeneric with *Mesophyllum*, but they concluded that *M. expansum* (Phillipi) Cabioch *et* Mendoza is to be recognized as distinct from *M. lichenoides*.

Subclass Rhodymeniophycidae
Order Ceramiales

Note: The results of a molecular-phylogenetic investigation by Choi et al. (2008) led them to propose a major re-organization of the family Ceramiaceae, leading to the recognition of the newly segregate families Callithamniaceae, Inkyuleeaceae, Spyridiaceae, and Wrangeliaceae. The genera credited to the Ceramiaceae *sensu lato* by Schneider and Wynne (2007) are listed under their appropriate new families and the Ceramiaceae *sensu stricto* below.

Family Callithamniaceae

Includes: *Aglaothamnion, Aristoptilon, Callithamnion, Carpothamnion, Crouania, Crouanophycus. Diapse, Euptilocladia, Euptilota, Euptilocladia, Gattya, Gulsonia, Heteroptilon, Hirsutithallia, Pseudocrouania, Pseudospora, Ptilocladia, Rhodocallis, Sciurothamnion, Seirospora*,

Family Ceramiaceae

Includes: *Acrothamnion, Acrothamniopsis, Amoenothamnion, Antithamnion, Antithamnionella, Ardreanema, Balliella, Callithamniella, Campylaephora, Carpoblepharis, Centroceras, Centrocerocolax, Ceramium, Corallophila, Dohrniella, Elisiella, Episporium*,

Gayliella **T.O. Cho, L. McIvor *et* S.M. Boo in Cho et al. 2008: 723.**

Note: *Gayliella*, typified by the virtually cosmopolitan *G. flaccida* (Harvey *ex* Kützing) T.O. Cho *et* L. McIvor, was separated from the genus *Ceramium*.

Herpochondria, Heterothamnion, Hollenbergia, Irtugovia, Leptoklonion, Macrothamnion, Microcladia. Perikladosporon, Perithamnion, Pterothamnion, Reinboldiella, Scagelia, Scageliopsis, Scagelothamnion, Spyridiocolax, Sympodothamnion, Syringocolax, Tetrathamnion, Tokidaea, Trithamnion.

Family Inkyuleeaceae

Includes: *Inkyuleea.*

Note: This is presently a monotypic family (Choi et al. 2008) based on the southern Australian *Inkyuleea ballioides* (Sonder) H.-G. Choi, Kraft *et* G.W. Saunders.

Family Spyridiaceae
Includes: *Spyridia*.
Note: This is presently a monotypic family (Choi et al. 2008).

Family Wrangeliaceae
Includes: *Anisochizus, Anotrichium, Antarcticothamnion, Baldockia, Boreothamnion, Bornetia, Calliclavula, Compsothamnionella, Compsothamnion, Dasyphila, Dasyptilon, Dasythamniella, Delesseriopsis, Desikacharyella, Deucalion, Diplothamnion, Drewiana, Falklandiella, Georgiella, Gordoniella, Grallatoria, Griffithsia, Guiryella, Gymnophycus, Gymnothamnion, Haloplegma, Halosia, Halurus*,

Hommersandiella **Alongi, Cormaci *et* G. Furnari 2007: 321.**

Interthamnion, Involucrana, Lasiothalia, Laurenciophila, Lejolisea, Lomathamnion, Lophothamnion, Mazoyerella, Medeiothamnion, Monosporus, Mortensenia, Muellerana, Neoptilota, Nwynea, Ochmapexus, Ossiella, Pleonosporium, Plumaria, Plumariella, Plumariopsis, Psilothalia, Ptilota, Ptilothamnion,

Ptilothamnionopsis **P.S. Dixon 1971: 61.**
Note: The spelling of this generic name is now corrected from the incorrect spelling in Schneider and Wynne (2007).

Radiathamnion, Rhipidothamnion, Rhododictyon, Seagriefia, Shepleya, Spermothamnion, Sphondylothamnion, Spongoclonium,

Stegengaea **Alongi, Cormaci *et* G. Furnari 2007: 318.**

Tanakaella, Tiffaniella,

Vickersia Karsakoff 1896: 388, emend. Børgesen 1930: 20.

Woelkerlingia **Alongi, Cormaci *et* G. Furnari 2007: 314.**

Wollastoniella, Wrangelia,

Zonariophila **Stegenga *et* Kempermann 1996: 126.**
Note: Previously, we unfortunately omitted the name of Kempermann as one of the co-authors of this generic name and the publication (Schneider and Wynne 2007).

Genera incertae sedis (formerly included in Ceramiaceae *sensu lato* but presently of uncertain position with the recent division of the family into several families):
Callidictyon, Perischelia, Pterocladiopsis, Ptilocladiopsis, Scagelonema, Skeletonella, Spencerella, Warrenia.

Family Delesseriaceae
Erythroglossum J. Agardh 1898: 174.
Synonym: ***Schizoneurina*** Doweld (2003).
Note: Doweld's (2003) action to replace *Schizoneura* (J. Agardh) J. Agardh (1898) *nom. illeg.* (non Schimper et Mougeot 1844) was taxonomically unnecessary in that the lectotype of *Schizoneura*, *S. subcostata* (J. Agardh) J. Agardh, is currently regarded as *Erythroglossum subcostatum* (J. Agardh) Ardré (Ardré 1970). *Schizoneurina* would become available if taxonomic evidence were offered to justify the separation of *E. subcostatum* from *Erythroglossum*.

Rhodokrambe **R.L. Moe in Hommersand et al. 2009: 516.**

Family Rhodomelaceae
Bostrychia Montagne in Sagra 1842: 39, *nom. cons.*
Synonym: *Stictosiphonia* J.D. Hooker *et* Harvey in Hooker (1847).
Note: Further evidence justifying the return of *Stictosiphonia*, segregated by King and Puttock (1989), to *Bostrychia* was offered by Zuccarello and West (2008).

Palisada **K.W. Nam 2007: 53.**
Note: In an initial paper, Nam (2006) presented evidence for recognition of the segregate genus *Palisada* in the ''*Laurencia* complex'', but the actual validations of both the generic name and the names of a number of species assigned to *Palisada* were effected in a later publication (Nam 2007).

Polysiphonia R. Greville 1823: ad. t. 90, *nom. cons*.
Synonym: *Polyochetum* Chevallier (1836).
Note: The above synonym did not appear in Kylin (1956) nor in Schneider and Wynne (2007).

Yuzurua **(K.W. Nam) Martin-Lescanne in Martin-Lescanne et al. 2010: 59.**
Note: Evidence for the elevation of this segregate genus of *Laurencia*, originally recognized by Nam (1999) as a subgenus, was presented by Martin-Lescanne et al. (2010). The genus is typified with *Yuzurua poiteaui* (J.V. Lamouroux) Martin-Lescanne in Martin-Lescanne et al. (2010).

Order Gelidiales
Family Gelidiaceae
Gelidium J.V. Lamouroux 1813: 128, *nom. cons.*
Synonym: *Acropeltis* Montagne (1837).
Note: Although we previously followed Kylin (1956) in indicating Montagne (1839) as the date of validation of this generic name, Montagne (1837) had validated this generic name earlier.

Order Acrosymphytales
Family Acrosymphytaceae
Acrosymphyton Sjöstedt 1926: 8.
Synonym: *Helminthiopsis* J. Agardh (1899) *nom. illeg*., non *Helminthopsis* Heer (1877).
Note: The name *Helminthiopsis* of J. Agardh, which was omitted in our red algal synoptic review (Schneider and Wynne 2007), is treated as a later homonym and is thus illegitimate.

Acrosymphytonema* C.-F. Boudouresque, M. Perret-Boudouresque *et* M. Knoepffler-Peguy 1984: 46, *nom. ined.
Note: The Index Nominum Algarum (2010) treats this generic name as invalid on the basis that its type species, *A. breemaniae* C.-F. Boudouresque, M. Perret-Boudouresque *et* M. Knoepffler-Peguy, was not validly published because neither a holotype nor a type locality was designated. Boudouresque et al. (1984) attempted to provide a different name for the dissimilar tetrasporophytic stage of *Acrosymphyton purpuriferum* (J. Agardh) Sjöstedt.

Order Gigartinales
Family Caulacanthaceae
Catenellocolax Weber-van Bosse 1928: 401.
Note: As previously pointed out, this poorly known genus, an alleged parasite of *Catenella* from Indonesia, is known only in the vegetative condition. In a study of similar growths found on the surface of *Catenella nipae* Zanardini in New South Wales, Australia, Zuccarello (2008) observed that the growths were actually galls composed of septate fungal hyphae. He suggested that the generic name may actually apply to this phenomenon generally, and the designation as a red-algal genus should be treated with caution until more collections from the type locality settle the matter.

Family Endocladiaceae
Endocladia J. Agardh 1842: 449.
Synonym: *Acanthocladia* Ruprecht (1851).
Note: The name *Acanthocladia* was omitted by Kylin (1956) and Schneider and Wynne (2007). Without designating a type species, Ruprecht recognized three species within his *Acanthocladia* [*A. asperrima* Rupr., *A. hamulosa* Rupr., and *A. muricata* (Endl.) Rupr.]. Both Harvey (1853) and Setchell and Gardner (1903) have treated *Acanthocladia* as congeneric with *Endocladia*.

Family Kallymeniaceae
***Austropugetia* R.L. Moe in Hommersand et al. 2009: 524.**

***Leniea* R.L. Moe in Hommersand et al. 2009: 523.**

***Psaromenia* D'Archino, W.A. Nelson *et* Zuccarello 2010: 77.**

***Variemenia* R.L. Moe in Hommersand et al. 2009: 526.**

Order Peyssonneliales
Note: Krayesky, Fredericq *et* J.N. Norris in Krayesky et al. (2009) established the new order Peyssonneliales for the single family Peyssonneliaceae.

Family Peyssonneliaceae
Ramicrusta D.R. Zhang *et* J.H. Zhou 1981: 538, 543.
Note: This genus was established on the single species *Ramicrusta nanhaiensis* D.R. Zhang *et* J.H. Zhou, regarded as endemic to waters of China. A second species, *R. textilis* Pueschel *et* G.W. Saunders, occurring in the Caribbean Sea, has been described by Pueschel and Saunders (2009), who supported the generic concept with molecular evidence.

Order Nemastomatales
Family Schizymeniaceae
Peyssonneliopsis Setchell 1905: 62.
Note: The generic name *Peyssonneliopsis*, which was omitted from our synoptic review (Schneider and Wynne 2007), was based on *P. epiphytica* Setchell *et* Lawson in Setchell (1905) from the west coast of North America and has been generally treated as congeneric with *Schizymenia* (Smith and Hollenberg 1943). Gabrielson et al. (2004) recognized *Peyssonneliopsis* as distinct from *Schizymenia*, treating it as a genus of ''Incertae sedis''.

Order Rhodymeniales
Family Champiacae
Coelothrix Børgesen 1910: 389.
Note: Despite the fact that diaphragms are lacking in the hollow central cavity of this genus, Le Gall et al. (2008) provided evidence for the transfer of *Coelothrix* from the Rhodymeniaceae to the Champiaceae.

***Neogastroclonium* L. Le Gall, Dalen *et* G.W. Saunders 2008: 1569.**
Note: *Neogastroclonium*, based on the type species *N. subarticulatum* (Turner) L. Le Gall, Dalen *et* G.W. Saunders from the Pacific coast of North America, was established by Le Gall et al. (2008) as a segregate genus from *Gastroclonium*.

Family Faucheaceae
Gloiocladia J. Agardh 1842: 87.
Synonym: *Endosira* J. Agardh (1899).
Note: Schneider and Wynne (2007) followed Kylin's (1956) treatment of *Endosira*, based on *E. australis* J. Agardh from South Australia, as an unassigned generic name. Womersley (1996), however, regarded *Endosira* as a later taxonomic synonym of *Gloiocladia*.

Family Fryeellaceae
Note: Le Gall et al. (2008) established this new family, assigning to it *Fryeella* Kylin (1930: 15) and *Hymenocladiopsis* R.L. Moe (1986: 1).

Family Hymenocladiaceae
Note: Le Gall et al. (2008) established this new family for *Asteromenia* Huisman *et* A. Millar (1996: 138), *Erythrymenia* F. Schmitz *ex* Mazza (1921: 106), and *Hymenocladia* J. Agardh (1852: 772).

Family Rhodymeniaceae
***Grammephora* N'Yeurt *et* Payri 2007: 287.**
Note: Although N'Yeurt and Payri (2007) assigned their new genus, based on *Grammephora peyssonnelioides* N'Yeurt *et* Payri from Vangunu Island, Solomon Islands, to the Rhodymeniaceae, Le Gall et al. (2008) placed the genus in the category of uncertain familial position.

Halopeltis J. Agardh 1854: 110.
Note: This genus, which was not included in the works of De Toni (1900, 1924), Kylin (1956), Irvine and Guiry (1980), or Womersley (1996), was regarded as congeneric with *Rhodymenia* by Schneider and Wynne (2007). Saunders and McDonald (2010) presented molecular and morphological evidence for the reinstatement of the genus as distinct from other genera in the Rhodymeniaceae.

Pseudohalopeltis **G.W. Saunders *et* B. McDonald (2010).**

Incertae sedis

Agardhinula De Toni 1897: 64.
Note: Le Gall et al. (2008) treated this genus as of uncertain position within the order.

Incertae sedis generalis

Selkia Klebahn 1939: 182.
Note: This generic name, based on the single species *Selkia lacustris* Klebahn, was overlooked both by Kylin (1956) and Schneider and Wynne (2007). It was described simply as a freshwater Rhodophycean.

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