

Review

A synoptic review of the classification of red algal genera a half century after Kylin's "*Die Gattungen der Rhodophyceen*"

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Abstract

Classification of the red algae (Rhodophyta) has undergone significant change since the seminal work of Harald Kylin, "*Die Gattungen der Rhodophyceen*," a half century ago. The number of genera has nearly doubled over this time period, at least in part due to recent molecular comparative work. Information gleaned from gene-sequencing analyses has resulted in a red algal classification that reflects a more accurate phylogenetic framework than that based solely on morphological data. This paper tabulates the known 834 genera of red algae today with taxonomic synonyms and literature references reflecting the great change over fifty years.

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

Introduction

In 1956, following an earlier tradition of lists compiling the known algae at the time, e.g., C. Agardh (1820, 1822–1823, 1824, 1828), J. Agardh (1848–1901), Kützinger (1849), and De Toni (1889–1924), Harald Kylin's posthumous "*Die Gattungen der Rhodophyceen*" provided a synopsis of all the known red algal genera at mid-century, 558 in total, partitioned into families and orders. Kylin provided each genus with a concise yet diagnostic description, and included information about the type species and distribution of the other entities of the genus known at the time. Many taxa were illustrated with line-drawings, and dichotomous keys were used to distinguish the many genera, families and orders. Since its publication, Kylin's volume has been the seminal work for subsequent red algal systematists (Guiry and Nyberg 1996), as well as a "point of departure for any revisionist attempts to alter the classification of red algae at and above the genus level" (Kraft 1981).

In the half century since "*Die Gattungen der Rhodophyceen*" appeared, our knowledge of red algal systematics has grown dramatically. With the advent of molecular sequencing and the consensus phylogenetic trees that have been generated for so many groups in the past 20 years, workers have discovered reliable genes to utilize

in classifying genera into higher taxa. Indeed today, many genera are placed in families and orders that Kylin would have been unable to imagine using only vegetative and reproductive anatomy 50 years ago. The classification of red algae that we present in this list contains 834 currently accepted generic names, along with all of the synonyms that have been attributed to them.

Format of the list

All genera established after Kylin (1956) have the authorities who described them as well as the year and page of the protolog printed in bold along with the proper names. This includes names of genera that were described after "*Die Gattungen der Rhodophyceen*" but were subsequently reduced to synonyms of earlier established genera. The References section contains the literature cited for all genera since 1956 as well as those prior to then, but 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 footnote, full attribution is given in the References. Various sources were consulted, not just the primary sources but also such online resources as Index nominum genericorum (Farr 2007), Index nominum algarum (Silva 2007) and AlgaeBase (Guiry and Guiry 2007).

Notes concerning genera are placed directly under them in the list, whereas those for orders and families are footnotes. The supraordinal taxonomic hierarchy that we employ basically follows Saunders and Hommersand (2004), the red algae forming a subkingdom of the kingdom Plantae based upon a phylogenetic consensus of molecular lineages gleaned from a number of prior studies and their own analyses. Some supraordinal taxa proposed by Yoon et al. (2006) have been incorporated. Where we deviate from the classification of Saunders and Hommersand (2004), a footnote is provided as explanation. Standardized author initials reflect Brummitt and Powell (1992). Names of fossil red algal taxa are not included.

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List of genera

Kingdom Plantae
Subkingdom Rhodoplantae
Phylum Cyanidiophyta
Class Cyanidiophyceae
Order Cyanidiales
Family Cyanidiaceae

Cyanidium Geitler 1933: 624.

Synonym: *Rhodococcus* Hirose (1958) *nom. illeg.* (non Hansgirg in Wittrock and Nordstedt 1884)

Note: Both Bourrelly (1970) and Kumano (2002) treated *Rhodococcus* Hirose (1958) as synonymous with *Cyanidium*; both genera were based on the same type. *Rhodococcus* Hansgirg is a genus of Cyanophyceae.

Cyanodioschyzon De Luca, Taddei et Varano 1978: 43.

Family Galdieriaceae
Galdieria Merola in Merola et al. 1982: 193.

Phylum Rhodophyta
Subphylum Rhodellophytina
Class Rhodellophyceae
Order Rhodellales
Family Glaucosphaeraceae¹

Dixoniella J.L. Scott, S.T. Broadwater, B.D. Saunders et J.P. Thomas 1992: 649–650.

Glaucosphaera Korshikov 1930: 222.

Note: This genus was not included in Kylin (1956).

Rhodella L. Evans 1970: 1.

Class Stylonematophyceae
Order Stylonematales
Family Stylonemataceae

Bangiopsis F. Schmitz in Engler and Prantl 1896: 314.

Note: The assignment of *Bangiopsis* to this family is based on Wilson et al. (2002). West et al. (2005) confirmed that position.

Chroodactylon Hansgirg 1885: 14.

Synonym: *Asterocytis* Gobi ex F. Schmitz in Engler and Prantl (1896)

Note: Kylin (1956) had used the name *Asterocytis*, but according to Drew and Ross (1965) that name was not validated until 1896, and therefore the correct name is *Chroodactylon*.

Chroothece Hansgirg in Wittrock and Nordstedt 1884: 696.

Synonyms: *Petrovanella* Kylin (1956); *Vanhoeffenia* Wille in Drygalski (1884); *Pseudoncobyrza* Geitler (1925)

Note: Both Saunders and Hommersand (2004) and Yoon et al. (2006) assigned this genus to this family. Kylin

(1956) did not include *Pseudoncobyrza* because the genus had been originally assigned to the Cyanophyceae. According to Bourrelly (1970), *Petrovanella* and *Pseudoncobyrza* are referable to *Chroothece*. He also thought that the monotypic genus *Vanhoeffenia* was very close to, even congeneric with, *Chroothece*.

Empselium G.I. Hansen et Scagel in Garbary et al. 1981: 150.

Note: West et al. (2005) assigned this genus to the Stylonemataceae.

Goniotrichopsis G.M. Smith 1943: 211.

Note: According to Wilson et al. (2002) placement of this genus in this family is incorrect, but they did not state where it belongs.

Neevea Batters 1900: 373.

Note: West et al. (2005) assigned this genus to this family.

Purpureofilum J.A. West, G.C. Zuccarello et J.L. Scott in West et al. 2005: 52.

Rhodaphanes J.A. West, G.C. Zuccarello, J.L. Scott et K.A. West in West et al. 2007a: 443.

Rhodosorus Geitler 1930: 635.

Note: According to Müller et al. (2001), this genus, although related to genera assigned to the Stylonemataceae, appears to deserve placement in a new family.

Rhodospira Geitler 1927: 25.

Rufusia D. Wujek et P. Timpano 1988: 165.

Stylonema Reinsch 1874–1875: 40.

Note: See Note under *Erythrotrichia* [below].

Class Porphyridiophyceae
Order Porphyridiales
Family Phragmonemataceae

Colacodictyon Feldmann 1955: 27.

Note: According to West et al. (2007a), this genus belongs to the Stylonematophyceae.

Glaucanema Reinhard 1885: 244.

Kneuckeria Schmidle 1905: 64.

Note: While recognizing this genus, Bourrelly (1970) thought that it was perhaps synonymous with *Chroodactylon*. Garbary et al. (1980) retained this genus in the Phragmonemataceae but referred to Drew's (1956) observation of the production of monosporangia similar to those in the Erythropeltidaceae.

Kyliniella Skuja 1926: 4.

Phragmonema Zopf 1882: 49.

Family Porphyridiaceae
Erythrobolus J.L. Scott, B. Baca, F.D. Ott et J.A. West 2006: 408.

¹ According to Saunders and Hommersand (2004), *Dixoniella*, *Glaucosphaera*, and *Rhodella* form a distinct lineage and may require separation as a distinct family. Yoon et al. (2006) proceeded to describe the new family Rhodellaceae to comprise these three genera. However, the family name Glaucosphaeraceae had already been validated by Skuja (1954).

Flintiella F.D. Ott in Bourrelly 1970: 194.

Porphyridium Nägeli 1849: 71, 138. *nom. cons.*

Synonyms: *Chaos* Bory de St.-Vincent ex Desmazières (1823) (*nom. rej.*); *Sarcoderma* Ehrenberg 1830: 504 (*nom. rej.*)

Subphylum Metarhodophytina²

Class Compsopogonophyceae

Order Compsopogonales

Family Boldiaceae

Boldia Herndon 1964: 575.

Family Compsopogonaceae

Compsopogon Montagne in Durieu de Maisonneuve 1846: 154.

Synonym: *Pericystis* J. Agardh (1847)

Compsopogonopsis V. Krishnamurthy 1962: 219.

Pulvinaster J.A. West, Zuccarello et J.L. Scott in West et al. 2007c: 478.

Synonym: ***Pulvinus*** J.A. West, Zuccarello et J.L. Scott in West et al. (2007b) *nom. illeg.*

Note: In their Corrigendum, West et al. (2007c) also corrected the specific epithet, such that this species is now *Pulvinaster venetus*.

Order Erythropeltidales

Family Erythrotrichiaceae

Chlidophyllon W.A. Nelson in Nelson et al. 2003: 311.

Note: This genus was established to accommodate an obligately epiphytic species of *Porphyra*. A study of its polysaccharide chemistry and molecular sequence analysis revealed that its relationship was with the order Erythropeltidales rather than the Bangiales.

Erythrocladia Rosenvinge 1909: 71.

Erythrotrichia Areschoug 1850: 435. *nom. cons.*

Synonyms: *Goniotrichum* Kützinger (1843) *nom. rej.*; *Ceramicola* Ørsted (1844) *nom. rej.*; *Callonema* Reinsch (1874–1875) *nom. illeg.*

Note: When Ross (in Drew and Ross 1965) stated that the type of *Goniotrichum* was based on Kützinger's material that he had in hand, this led him to recognize *Goniotrichum* as the "correct name" for the genus. But later, Art. 10.1 of the Code (McNeill et al. 2006a) defined the type of a name of a genus as the type of a name of a species. Thus, as pointed out by Wynne (1985d) *Goniotrichum* and *Erythrotrichia*, both based on *Conferva ceramicola* Lyngbye, must be treated as nomenclatural synonyms. The fact that the name *Erythrotrichia* has already been conserved causes the name *Goniotrichum* to be rejected. *Callonema* was a superfluous substitute name for *Goniotrichum* and is thus illegitimate (Drew and Ross 1965).

Membranella Hollenberg et I.A. Abbott 1968: 1240.

Porphyropsis Rosenvinge 1909: 68.

Porphyrostromium Trevisan 1848: 100.

Synonyms: *Erythropeltis* F. Schmitz in Engler and Prantl (1896); ***Erythrotrichopeltis*** Kornmann (1984)

Note: Wynne (1986b) pointed out that Kornmann's (1984) *Erythrotrichopeltis* is to be treated as a later synonym of *Porphyrostromium*.

Pyrophyllon W.A. Nelson in Nelson et al. 2003: 310.

Note: This genus was established to accommodate an obligately epiphytic species of *Porphyra*. A study of its polysaccharide chemistry and molecular sequence analysis revealed that its relationship was with the order Erythropeltidales rather than the Bangiales.

Sahlingia Kornmann 1989: 227.

Smithora Hollenberg 1959: 3.

Order Rhodochaetales

Family Rhodochaetaceae

Rhodochaete Thuret ex Bornet 1892: 261.

Subphylum Eurhodophytina³

Class Bangiophyceae

Order Bangiales

Family Bangiaceae

Bangia Lyngbye 1819: 82.

Synonyms: *Aspalatia* Ercegovic (1927); *Bangiella* Gaillon (1833); *Diadenus* Palisot de Beauvois ex O. Kuntze (1891) *nom. illeg.*; *Girardia* Gray (1821); *Spermogonia* Bonnemaison (1822) *nom. illeg.*

Dione W.A. Nelson in Nelson et al. 2005: 142.

Minerva W.A. Nelson in Nelson et al. 2005: 141.

Porphyra C. Agardh 1824: xxxii, 190. *nom. cons.*

Synonyms: *Phyllona* J. Hill (1773) *nom. rej.*; *Diploderma* Kjellman (1883) *nom. illeg.* (non Link, 1816); *Diplodermidium* Kuntze (1891); *Conchocelis* Batters in Murray (1892); *Wildemania* G. De Toni (1890); *Porphyrella* G.M. Smith et Hollenberg (1943)

Note: Hawkes (1977) provided evidence that *Porphyrella gardneri* G.M. Smith et Hollenberg, the type of the genus, conformed in all respects to *Porphyra*.

Pseudobangia K.M. Müller et Sheath in Müller et al. 2005: 154.

Zachariasia Lemmermann 1895: 60.

² The establishment of this subphylum by Saunders and Hommersand (2004) cited Magne's (1989) earlier recognition of the subclass Metarhodophycidae.

³ The establishment of this subphylum by Saunders and Hommersand (2004) cited Magne's (1989) earlier recognition of the subclass Eurhodophycidae.

Class Florideophyceae**Subclass Hildenbrandiophycidae****Order Hildenbrandiales⁴****Family Hildenbrandiaceae**

Apophlaea Harvey in J.D. Hooker and Harvey 1845: 549.
Note: Pueschel (1989) and Saunders and Bailey (1999) provided evidence for the placement of *Apophlaea* in the Hildenbrandiaceae.

Hildenbrandia Nardo 1834: 676. [*Hildbrandtia*] (*nom. et orth. cons.*)

Subclass Nemaliophycidae**Order Acrochaetiales****Family Acrochaetiaceae⁵**

Acrochaetium Nägeli in Nägeli and Cramer 1858: 532.
Synonyms: *Kylinia* Rosenvinge (1909); *Grania* (Rosenvinge) Kylin (1944); *Liagorophila* Yamada (1944); *Chromastrum* Papenfuss (1945)

Note: Using SSU and LSU rDNA sequence data and morphological evidence, Harper and Saunders (2002a) recently circumscribed *Acrochaetium* for marine species with monosporangia and stellate plastids.

Audouinella Bory de St.-Vincent 1823: 340. [*Audouinella*] *nom. et orth. cons.*

Note: Despite at one point being the single genus for all species of the Acrochaetiaceae (Garbary 1979), *Audouinella* presently contains all of the freshwater species described in the family (Harper and Saunders 2002a).

Rhodochorton Nägeli 1862: 326, 355. *nom. cons.*

Synonym: *Thamnidium* Thuret in Le Jolis (1863) *nom. illeg.* (non Link ex Walloth 1833)

Note: Using SSU and LSU rDNA sequence data and morphological evidence, Harper and Saunders (2002a) circumscribed *Rhodochorton* for marine species lacking monosporangia and stellate plastids.

⁴ See Pueschel and Cole (1982) for the recognition of this order. Prior to their paper, the Hildenbrandiaceae was placed within the order Cryptonemiales. Further support for the elevation of this group to ordinal level was given by Pueschel (1982).

⁵ Since the time of the first described species that would ultimately be placed in this family (Lightfoot 1777), various morphological and reproductive characteristics have been applied to segregate species into different genera of the Acrochaetiaceae (Woelkerling 1971, 1983c). Drew (1928) and Garbary (1979) found none of the characteristics used by other workers to be reliable among species or even individuals; so they proposed monogeneric concepts for the family. On the other hand, Lee and Lee (1988) proposed a classification with asexual reproduction as the primary criterion and chloroplast morphology as a secondary criterion for generic delineation, such that *Audouinella* was restricted to taxa producing monosporangia and having parietal laminate or ribbon-shaped chloroplasts, *Acrochaetium* to taxa producing monosporangia and having stellate chloroplasts, and *Rhodochorton* to taxa having asexual cycles with tetrasporangia but no monosporangia. With the advent of molecular sequencing, genera in the Acrochaetiaceae have again been circumscribed to fit SSU and LSU rDNA-generated phylogenetic trees and morphological features (Harper and Saunders 2002a).

Order Colaconematales⁶**Family Colaconemataceae**

Colaconema Batters 1896: 8.

Note: Harper and Saunders (2002a) suggested that given additional molecular work, several other genera might be delineated in this monogeneric family. Two possible genera they suggested might belong in the family, *Grania* and *Kylinia*, remain as junior synonyms of *Acrochaetium* (Acrochaetiales) until their type species are sequenced.

Order Balbianiales⁷**Family Balbianiaceae**

Balbiana Sirodot 1876: 149.

Note: Garbary (1987) treated *Balbiana* as congeneric with *Audouinella* when he proposed a monogeneric circumscription of the acrochaetioids. Later, using molecular evidence, Harper and Saunders (1998) found that *Balbiana* deserved generic distinction.

Rhododraparnaldia Sheath, Whittick et K.M. Cole 1994: 1.

Order Balliales**Family Balliaceae**

Ballia Harvey 1840: 191.

Note: This genus, which had previously been included in the Ceramiaceae (order Ceramiales), was shown by Choi et al. (2000) to possess a "pit-plug assemblage" that was in a lineage distinct from the Ceramiales, but sister to the Acrochaetiales, Batrachospermales, Nemaliales, and Palmariales. Molecular data, based on small-subunit rDNA sequence analysis, also supported this relationship with these orders and remote from the Ceramiales. Thus, *Ballia*, including the generitype *B. callitricha* (C. Agardh) Kützinger, and a few other species, were moved into their own family and order, whereas certain other species that were unrelated were moved to the new genus *Inkyuleea* in the Ceramiaceae.

Order Batrachospermales⁸**Family Batrachospermaceae**

Balliopsis G.W. Saunders et Necchi 2002: 63.

Batrachospermum Roth 1797: 36.

Synonyms: *Batrachospermella* Gaillon (1833); *Charospermum* Link in Nees (1820); *Gelatinaria* Floerke ex Walloth (1831); *Torularia* Bonnemaïson (1828)

Nothocladus Skuja 1934: 186.

Petrohua G.W. Saunders in Vis et al. 2007: 111.

⁶ Using SSU and LSU rDNA sequence data and morphological evidence, Harper and Saunders (2002a) separated *Colaconema* from the Acrochaetiaceae into its own family and order.

⁷ Harper and Saunders (1998) presented evidence based on SSU and LSU rDNA sequence data that *Balbiana* and *Rhododraparnaldia* were related, forming a lineage that might warrant recognition as an order. The order and family were later proposed by Sheath and Müller (1999).

⁸ See Pueschel and Cole (1982) for the establishment of this order.

Sirodotia Kylin 1912: 38.

Tuomeya Harvey 1858: 64.

Synonym: *Baileya* Kützinger (1857) *nom. illeg.* (non Harvey et A. Gray ex J. Torrey in Emory 1848)

Family Lemaneaceae

Lemanea Bory de St.-Vincent 1808: 178. *nom. cons.*

Synonyms: *Apona* Adanson (1763) *nom. rej.*; *Gonycladon* Link in Nees (1820); *Lemanella* Gaillon (1833); *Nodularia* Link ex Lyngbye (1819) *nom. rej.*; *Polysperma* Vaucher (1803); *Trichogonum* Palisot de Beauvois (1808); *Vertebraria* Roussel (1806); *Sacheria* Sirodot (1872) *nom. illeg.* (non Ettingshausen 1852)

Note: Silva (1959) explained why *Sacheria* Sirodot was a superfluous and thus illegitimate name. It is also a later homonym.

Paralemanea (P.C. Silva) Vis et Sheath 1992: 177.

Note: This genus was based on *Lemanea* subg. *Paralemanea* P.C. Silva (1959).

Family Psilosiphonaceae

Psilosiphon Entwistle 1989: 469.

Order Corallinales⁹

Family Corallinaceae

Subfamily Mastophoroideae

Hydrolithon (Foslie) Foslie 1909: 55.

Synonyms: *Fosliella* M. Howe in Britton and Millspaugh (1920); *Porolithon* (Foslie) Foslie (1909)

Note: Penrose and Woelkerling (1992) offered reasons to justify the treatment of *Porolithon* as congeneric with *Hydrolithon*.

Lesueuria Woelkerling et Ducker 1987: 193.

Lithoporella (Foslie) Foslie 1909: 55.

Note: According to Turner and Woelkerling (1982a) *Lithoporella* and *Mastophora* cannot be separated only on characteristics of the vegetative thallus. An emended concept of the genus was given by Turner and Woelkerling (1982b).

Mastophora Decaisne 1842: 365.

Metamastophora Setchell 1943: 130.

Note: Turner and Woelkerling (1982b) provided an emended concept of this genus and an in-depth discussion of its relationship to other genera in the family.

Neogoniolithon Setchell et L.R. Mason 1943: 89.

Synonym: **Paragoniolithon** W.H. Adey, R.A. Townsend et Boykins (1982)

Note: Woelkerling (1987b) proposed the merger of *Paragoniolithon* into *Neogoniolithon*.

⁹ The Corallinaceae was included by Kylin (1956) as a family in the order Cryptonemiales. Silva and Johansen (1986) provided reasons to segregate the family into its own order. A few previous authors had adopted the taxonomic concept of the Corallinales but had failed to validate the ordinal name. Recently, Le Gall and Saunders (2007) established the subclass Corallinophycidae for the Corallinales and the Rhodogorgonales.

Pneophyllum Kützinger 1843: 385.

Synonyms: *Heteroderma* Foslie (1909); *Guerinea* Picquard (1912)

Note: See Chamberlain (1983) for the proposal that *Heteroderma* is congeneric with *Pneophyllum*. Penrose and Woelkerling (1991) discussed new morphological and anatomical data, including the modes of tetrasporangial conceptacle formation, that could be used to distinguish *Pneophyllum* from *Spongites*. Differences in thallus thickness, that had formerly been used to distinguish these genera, were observed not to be a useful criterion.

Spongites Kützinger 1841: 30.

Synonym: *Paraspora* Heydrich (1900) *nom. illeg.* (non W. Grove 1884)

Note: *Spongites* was not recognized as a distinct genus by Kylin (1956). Woelkerling (1985a) presented reasons to justify the recognition of *Spongites*. This was followed by Penrose and Woelkerling (1988), who concluded that on the basis of vegetative features used to delimit these genera, *Spongites* could not be separated from *Hydrolithon* and *Porolithon*. Penrose and Woelkerling (1988) proposed that reproductive features could be used to recognize some species of *Spongites* as belonging in a distinct genus. Two fundamentally distinct patterns of tetrasporangial conceptacle development were observed by Penrose and Woelkerling (1992), one pattern in the type species of *Spongites* and the other pattern in the type species of both *Hydrolithon* and *Porolithon*.

Subfamily Corallinoideae

Alatocladia (Yendo) H.W. Johansen 1969: 55.

Arthrocardia Decaisne 1842: 365.

Synonyms: *Duthiea* Manza (1937) *nom. illeg.* (non Hackel 1896); *Duthiophycus* Tandy (1938)

Calliarthron Manza 1937: 46.

Cheilosporum (Decaisne) Zanardini 1844: 187.

Chiharaea H.W. Johansen 1966: 59.

Corallina Linnaeus 1758: 805.

Synonyms: *Joculator* Manza (1937); *Titanephilum* Nardo (1834)

Haliptilon (Decaisne) J. Lindley 1846: 25.

Synonym: **Cornicularia** (Manza) V.J. Chapman et P.G. Parkinson (1974) *nom. illeg.* [non (Schreber) Hoffmann 1792]

Note: Kylin (1956) did not include *Haliptilon*. Johansen and Silva (1978) reviewed the history of the genus, stating that Decaisne's (1842) original spelling of the name '*Halipylon*' (as a section of *Jania*) was corrected by Montagne (1845) to *Haliptilon*. Johansen (1970), unaware that Lindley (1846) had already elevated the taxon to generic rank, repeated that process and assigned to the genus a species (*Corallina subulata* J. Ellis et Solander) that was not one originally placed in the taxon by Decaisne. Johansen and Silva (1978) selected *Haliptilon cuvieri* (J.V. Lamouroux) H.W. Johansen et P.C. Silva as lectotype of the genus. Later, Garbary and Johansen (1982) proposed

H. rosea (Lamarck) Garbary et H.W. Johansen as the correct name for the type species. Chapman and Parkinson (1974) inadvertently raised Manza's (1937) subgenus *Cornicularia* (of *Corallina*) to generic status. But that was a later homonym. Johansen and Womersley (1986) treated *Cornicularia* as congeneric with *Haliptilon*.

Jania J.V. Lamouroux 1812: 186.

Marginisporum (Yendo) Ganesan 1968: 26.

Masakiella Guiry et O.N. Selivanova 2007: 235.

Synonym: non *Masakia* Kloczkova (1987) *nom. illeg.* [non (Nakai) Nakai 1949]

Pachyarthron Manza 1937a: 45.

Synonyms: *Bossea* Manza (1937) *nom. illeg.* (non Reichenbach 1841); *Bossiella* P.C. Silva (1957a)

Note: Kylin (1956) recognized *Bossea* and *Pachyarthron* as distinct genera, both originating with Manza (1937). Silva (1957a) proposed the new name *Bossiella* to replace the illegitimate name *Bossea* of Manza. According to Johansen (1969), "no fundamental differences exist" for the separation of these two genera, and so he treated *Pachyarthron* as a subgenus of *Bossiella*. We here treat *Pachyarthron* and *Bossiella* as congeneric. *Pachyarthron*, however, has priority over *Bossiella*. Accordingly, some taxa of *Bossiella* are transferred into *Pachyarthron* in Appendix I.

Serraticardia (Yendo) P.C. Silva 1957a: 48.

Yamadaea ["*Yamadaia*"] Segawa 1955: 241.

Note: The erroneous original spelling was corrected by Johansen (1969).

Subfamily Lithophylloideae¹⁰

Amphiroa J.V. Lamouroux 1812: 186.

Ezo W.H. Adey, T. Masaki et Akioka 1974: 331.

Lithophyllum Philippi 1837: 387.

Synonyms: *Hyperantherella* Heydrich (1900); *Crodelia* Heydrich (1911); *Stichospora* Heydrich (1900); *Perispermom* Heydrich (1900); *Pseudolithophyllum* Lemoine (1913); *Stereophyllum* Heydrich (1904) *nom. illeg.* (non Mitten 1859)

Note: In a study of original materials used by Philippi when the genus was established, Woelkerling (1983b) showed that only two of the four species first placed in *Lithophyllum*, including the generitype, conform to the present-day concept of the genus. In a study of the only species assigned to *Perispermom*, *P. hermaphroditum* Heydrich, Woelkerling (1991) found the material to represent a heterotypic synonym of *Lithophyllum*.

Lithothrix J.E. Gray 1867: 33.

¹⁰ Using gene-sequence analyses, Bailey (1999) provided a revised classification of this subfamily, assigning to it both geniculate taxa (*Amphiroa* and *Lithothrix*) and non-geniculate taxa (*Lithophyllum*).

Tenarea Bory de St.-Vincent 1832: 207.

Note: Based on their studies of type collections, Woelkerling et al. (1985) concluded that *Tenarea*, as they circumscribed it, contains only one species, *T. tortuosa* (Esper) Me. Lemoine. Other species that had been assigned to *Tenarea* actually belong to *Lithophyllum* and *Titanoderma*.

Titanoderma Nägeli 1858: 532.

Synonyms: *Dermatolithon* Foslie (1898); *Litholepis* Foslie (1905)

Note: There has been much debate on whether to maintain *Titanoderma* as distinct from *Lithophyllum* (Chamberlain et al. 1991, Irvine and Chamberlain 1994) or to place it within *Lithophyllum* (Campbell and Woelkerling 1990, Woelkerling and Campbell 1992, Woelkerling 1996, John et al. 2004). The results of Bailey's (1999) study using a molecular comparison demonstrated that *Titanoderma* is distinct from *Lithophyllum*. Woelkerling et al. (1985) proposed that *Titanoderma* is an earlier homotypic synonym of *Dermatolithon*. Woelkerling (1986) showed that *Litholepis* is a heterotypic synonym of *Titanoderma*.

Subfamily Metagoniolithoideae

Metagoniolithon Weber-van Bosse 1904: 86, 101.

Family Hapalidiaceae¹¹

Subfamily Austrolithoideae¹²

Austrolithon A.S. Harvey et Woelkerling 1995: 363.

Boreolithon A.S. Harvey et Woelkerling 1995: 374.

Epulo R.A. Townsend et Huisman 2004: 289.

Subfamily Choreonematoideae¹³

Choreonema F. Schmitz 1889: 455.

Synonym: *Chaetolithon* Foslie (1898)

Note: According to Woelkerling (1987c) *Chaetolithon* is a later heterotypic synonym of *Choreonema*, and a single species, *C. thuretii* (Bornet) F. Schmitz, is to be assigned to *Choreonema*.

Subfamily Melobesioideae

Clathromorphum Foslie 1898: 4.

Synonyms: **Neopolyporolithon** W.H. Adey et H.W. Johansen (1972); **Antarcticophyllum** (Me. Lemoine) M.L. Mendoza (1976b)

Note: Lebednik (1977) proposed treating *Neopolyporolithon* as congeneric with *Clathromorphum*, and he disagreed with Cabioch's (1972) proposal to relegate *Clathromorphum* to subgeneric status within *Lithotham-*

¹¹ Harvey et al. (2003a) proposed the reinstatement of this family, which had been validated by Gray (1864), and at the same time they emended its concept to include the following three subfamilies: Austrolithoideae, Choreonematoideae, and Melobesioideae.

¹² Harvey and Woelkerling (1995) established this new subfamily to accommodate their two new genera *Austrolithon* and *Boreolithon*.

¹³ Woelkerling (1987a) showed that the unique combination of features displayed in *Choreonema* does not allow its assignment to any existing subfamily of the Corallinaceae, and so he established a new subfamily to accommodate it.

nion. Mendoza and Cabioch (1985) proposed treating *Antarcticophyllum* as congeneric with *Clathromorphum*.

***Exilicrusta* Y.M. Chamberlain 1992: 185.**

***Kvaleya* W.H. Adey et Sperapani 1971: 31.**

Lithothamnion* Heydrich 1897: 412. *nom. cons.

Note: In a study of original materials used by Philippi when "*Lithothamnium*" was established, Woelkerling (1983a) showed that none of the five species included in the initial presentation conforms to the present-day concept of the genus. In other words, the name "*Lithothamnium*" Philippi had been persistently applied to a taxon that did not include its nomenclatural type, and thus it had to be rejected. The proposal made by Woelkerling (1985b) to conserve *Lithothamnion* Heydrich with the designated lectotype *L. muelleri* Rosanoff, against *Lithothamnion* Philippi, was approved.

***Mastophoropsis* W.J. Woelkerling 1978: 210.**

***Melobesia* J.V. Lamouroux 1812: 186.**

Synonyms: *Epilithon* Heydrich (1897); *Hapalidium* Kützing (1843)

***Mesophyllum* Me. Lemoine 1928: 251.**

Synonym: *Polyporolithon* L.R. Mason (1953)

Note: Woelkerling and Irvine (1986b) designated and critically examined neotype specimens of *Mesophyllum lichenoides* (J. Ellis) Me. Lemoine, the generitype. An account of Australian material of *M. incisum* (Foslie) W.H. Adey led Woelkerling and Harvey (1992) to reconsider the circumscription of the genus.

Phymatolithon* Foslie 1898: 4. *nom. cons.

Synonyms: *Apora* Gunnerus (1768) (*nom. rej.*); *Nullipora* Lamarck (1801); *Eleutherospora* Heydrich (1900); *Squamolithon* Heydrich (1911); ***Leptophytum* W.H. Adey (1966)**

Note: Woelkerling and Irvine (1986a) discussed the complicated history with regard to the typification of this genus. They designated *Millepora calcarea* Pallas as neotype, and on the basis of this neotype they were able to review the generic concept of the genus. Irvine and Woelkerling's (1986) proposal to conserve the name *Phymatolithon* against *Apora* Gunnerus (1768) was approved. In that *Nullipora* Lamarck (1801) has the same type as *Apora*, it is automatically rejected, although not specified [Art. 14.4 of the ICBN (McNeill et al. (2006a))]. Wilks and Woelkerling (1994) addressed problems in the delimitation of *Leptophytum* from *Phymatolithon*. Düwel and Wegenberg (1996) proposed merging *Leptophytum* within *Phymatolithon* and designated an epitype with reference to the holotype of *Lithophyllum leave* Strömfelt (*nom. illeg.*). Adey et al. (2001) argued for the re-instatement of the genus. This was followed by the conclusion by Woelkerling et al. (2002) that *Leptophytum* should not be recognized as a genus distinct from *Phymatolithon*. Athanasiadis and Adey (2003) made the proposal for the conservation of the name *Lithophyllum leave* Strömfelt, but the Committee for Algae did not recommend the pro-

posal (Compère 2004: 1066), and such a recommendation was approved by the General Committee at the XVII International Botanical Congress (McNeill et al. 2006b: 798). Therefore, even though one cannot preclude the possibility that a genus separate from *Phymatolithon* may occur, a separate genus with the name *Leptophytum* cannot exist according to the rules of the ICBN.

***Synarthrophyton* R.A. Townsend 1979: 252.**

Note: Although Ricker (1987) proposed treating this genus as congeneric with *Mesophyllum*, other workers (May and Woelkerling 1988, Woelkerling 1988, Woelkerling and Harvey 1993, Woelkerling in Womersley 1996, Harvey et al. 2003b) offered justification to recognize this pair of genera as distinct from one another.

Family Sporolithaceae¹⁴

***Heydrichia* R.A. Townsend, Y.M. Chamberlain et Keats 1994: 177.**

Note: The delimitation of the two genera within the Sporolithaceae was discussed by Townsend et al. (1995).

***Sporolithon* Heydrich 1897: 42, 66.**

Note: Woelkerling and Townsend (in Woelkerling 1988) and Townsend et al. (1995) have clarified past confusions about the circumscription of *Sporolithon* and its relationship to the name *Archaeolithothamnion* Rothpletz ex Foslie (1898). The latter name was treated by Woelkerling (1988) as a genus of uncertain status.

Order Nemaliales

Family Liagoraceae

***Akalaphycus* Huisman, I.A. Abbott et A.R. Sherwood 2004a: 270.**

Note: The two species assigned to this genus by Huisman et al. (2004) had previously been placed in the genus *Rhodopeltis* (Yamada 1935) and then in the genus *Stenopeltis* (Itano and Yoshizaki 1992).

***Cumagloia* Setchell et N.L. Gardner 1917: 398.**

***Cylindraxis* Kraft 1989: 276.**

***Dermonema* Harvey ex Heydrich 1894: 289.**

***Dotyophycus* I.A. Abbott 1976: 125.**

***Ganonema* K.-C. Fan et Y.C. Wang 1974: 492.**

Note: Although Abbott (1984) presented arguments to merge Fan and Wang's genus with *Liagora*, Huisman and Kraft (1994) later reinstated *Ganonema* with an emended definition. Subsequent workers (e.g., Afonso-Carrillo et al. 1998, Ballantine and Aponte 2002, Huisman et al. 2004b, Huisman 2006) have accepted *Ganonema* as distinct from *Liagora*.

***Gloiotrichus* Huisman et Kraft 1994: 74.**

¹⁴ Verheij (1993) established the family Sporolithaceae, assigning the single genus *Sporolithon* to it. Earlier, Johansen (1969) described the tribe Sporolithaeae and Cabioch (1971, 1972) had recognized the subfamily Sporolithoideae within the Corallinaceae.

Helminthocladia J. Agardh 1851. *nom. cons.*
 Synonym: *Dorella* Weber-van Bosse (1921) *nom. illeg.*
 (non Bubani 1901)

Helminthora J. Agardh 1851: 415. *nom. cons.*

Izziella Doty 1978: 34.

Note: Although Abbott (1990) subsumed *Izziella* within *Liagora*, Huisman and Schils (2002) provided reasons that the genus is worthy of recognition in their taxonomic treatment in which *Liagora* is a more narrowly circumscribed genus.

Liagora J.V. Lamouroux 1812: 185.

Liagoropsis Yamada 1944: 19.

Nemalion Duby 1830: 959.

Patenocarpus Yoshizaki 1987: 47.

Stenopeltis Itono et Yoshizaki 1992: 142.

Note: This genus was initially placed in the Polyidaceae, but Huisman et al. (2004a) offered evidence, including molecular data, showing that it is more correctly placed in the Liagoraceae.

Titanophycus Huisman, G.W. Saunders et A.R. Sherwood in Huisman 2006: 119.

Trichogloea Kützinger 1847: 53.

Trichogloeopsis I.A. Abbott et Doty 1960: 676.

Yamadaella I.A. Abbott 1970: 116.

Family Galaxauraceae¹⁵

Actinotrichia Decaisne 1842: 118.

Dichotomaria Lamarck 1816: 143.

Synonyms: *Alysium* C. Agardh (1823); *Halysium* Kützinger (1843) *nom. illeg.*; *Brachycladia* Sonder (1855); *Zanardinia* J. Agardh (1876) *nom. illeg.* (non Nardo ex P. Crouan et H. Crouan 1857)

Note: Although Kylin (1956) had treated *Dichotomaria* as congeneric with *Galaxaura*, Huisman et al. (2004) presented evidence for its resurrection. According to Wynne (unpubl. data), *Alysium holtingii* C. Agardh, the generi-

type, is a taxonomic synonym of *Dichotomaria obtusata* (J. Ellis et Solander) Lamarck (Decaisne 1842). The transfer of its type species to *Dichotomaria* renders *Brachycladia* congeneric with that genus.

Galaxaura J.V. Lamouroux 1812: 185.

Synonyms: *Holonema* Areschoug (1855); *Microthoe* (Decaisne) Harvey (1855)

Tricleocarpa Huisman et Borowitzka 1990: 164.

Note: This genus was segregated by Huisman and Borowitzka (1990) from *Galaxaura*, with two species, the generitype *T. cylindrica* (J. Ellis et Solander) Huisman et Borowitzka and *T. oblongata* (J. Ellis et Solander) Huisman et Borowitzka. The latter species was later renamed *T. fragilis* (Linnaeus) Huisman et R.A. Townsend (Huisman and Townsend 1993).

Family Scinaiceae¹⁶

Gloiophloea J. Agardh 1872: 28.

Note: In-depth accounts of the morphology, reproductive characteristics, and life histories of species of this genus were provided by Huisman (1985b, 1987).

Nothogenia Montagne 1843: 302.

Synonyms: *Chaetangium* Kützinger (1843); *Haloderma* Ruprecht (1850); *Rhodosaccion* (J. Agardh) Montagne in Gay (1852)

Note: Parkinson (1983) discussed nomenclatural problems with *Chaetangium* and argued for the re-adoption of *Nothogenia*.

Scinaia Bivona-Bernardi 1822: 232.

Synonyms: *Ginannia* Montagne in Webb and Berthelot (1841 [*Ginnania*]) (non Scopoli 1777); *Myelomium* Kützinger (1843); **Pseudogloiophloea** Levring in Svedelius (1956); *Pseudoscinaia* Setchell (1914)

Note: In a study using type specimens of the taxa, Huisman (1985b) offered evidence to merge *Pseudoscinaia* and *Pseudogloiophloea* within *Scinaia*. *Scinaia* was recognized to be a genus with surface utricles that were corticated to some degree, whereas *Gloiophloea* was recognized to be a genus completely devoid of surface utricles (Huisman 1986).

Whidbeyella Setchell et N.L. Gardner 1903: 294.

Note: Scagel (1962c) provided an account of the morphology of this seldom-collected monotypic genus.

Order Palmariales¹⁷

¹⁶ Huisman et al. (2004c) established the family Scinaiceae to accommodate genera with uncalcified thalli that had been formerly placed in the Galaxauraceae.

¹⁷ Ragan et al. (1994) found that the Palmariales were closely related to the morphologically distinct Acrochaetiales and Nemaliales using SSU rDNA sequence analysis. Using this information and pit-plug cap similarities, they suggested the possibility that these three orders, along with the Corallinales and Batrachospermales, may have diverged monophyletically from the main red algal lineage.

¹⁵ Wang et al. (2005) re-examined the genera of this family, using comparative *rbcl* sequence analyses, and identified four distinct assemblages corresponding to the four genera now recognized. Useful generic criteria included the relationship of gametophyte and tetrasporophyte (isomorphic or dimorphic) and the nature of a persistent pericarp around the cystocarp (present or absent). Also, each of the genera was characterized by a distinct type of life history.

Family Palmariaceae¹⁸

Coriophyllum Setchell et N.L. Gardner in Gardner 1917: 396.

Synonym: *Asymmetria* Setchell et N.L. Gardner in Gardner (1927) *nom. illeg.*

Devaleraea Guiry 1982: 62.

Note: The type species of this genus is *Devaleraea ramentacea* (Linnaeus) Guiry, based on *Halosaccion ramentaceum* (Linnaeus) J. Agardh.

Halosaccion Kützting 1843: 439.

Neohalosacciocolax I.K. Lee et Kurogi 1978: 131.

Palmaria Stackhouse 1801: xxxii.

Synonym: *Leptosarca* A. Gepp et E.S. Gepp (1905)

Note: *Palmaria* had been a *nom. rej.* relative to *Rhodymenia nom. cons.* (Silva 1952). But these two genera are heterotypic. Guiry (1974) reinstated this genus to accommodate the type. *Leptosarca*, which Kylin (1956) had treated as congeneric with *Leptosomia*, was subsumed by Ricker (1987) within *Palmaria*.

Family Rhodophysemataceae¹⁹

Halosacciocolax Lund 1959: 192.

Meiodiscus G.W. Saunders et McLachlan 1991: 283.

Pseudorhododiscus Masuda 1976a: 124.

Rhodophysema Batters 1900: 377.

Synonym: *Rhododermis* P. Crouan et H. Crouan in J. Agardh (1851) *nom. illeg.* (non Harvey 1844)

Note: Kylin (1956) had recognized *Rhododermis* P. Crouan et H. Crouan in J. Agardh (1851). Denizot (1968) pointed out that the Crouans' name was a later homonym of that of Harvey (1844) and thus illegitimate.

Rhodophysema Masuda 1976b: 184.

Family Rhodothamniellaceae²⁰

Camontagnea Pujals 1981: 14.

Synonym: *Acanthonema* J. Agardh (1846) *nom. rej.* (non J.D. Hooker 1862, *nom. cons.*)

¹⁸ When Guiry (1974) established the Palmariaceae, he assigned to this family the "aberrant" genera *Palmaria*, *Halosaccion*, and *Leptosarca*. At that time these genera were considered different from Rhodymeniaceae *sensu stricto* in their apparent lack of a carposporophytic generation and the presence of a stalk cell involved in the formation of tetrasporangia. It was not until the work by Van der Meer and Todd (1980) and Van der Meer (1981) that the life history of the members of the Palmariaceae was understood, and the new order Palmariales was created by Guiry and Irvine (in Guiry 1978) for this group of algae. The placement of the families Rhodophysemataceae and Rhodothamniellaceae within the Palmariales was strongly supported by evidence offered by Saunders et al. (1995).

¹⁹ The assignment of this family to the Palmariales was confirmed by Saunders et al. (1995). It had been tentatively placed in this order by Saunders and McLachlan (1989, 1991).

²⁰ This family was established by Saunders (in Saunders et al. 1995) and thought to represent an early lineage within the Palmariales.

Rhodothamniella Feldmann in T. Christensen 1978: 67.

Order Rhodogorgonales²¹**Family Rhodogorgonaceae**

Renouxia Fredericq et J.N. Norris 1995: 329.

Rhodogorgon J.N. Norris et K. Bucher 1989: 1053.

Order Thoreales²²**Family Thoreaceae**

Thorea Bory de St.-Vincent 1808: 127.

Synonyms: *Polycoma* Palisot de Beauvois (1808); *Thorella* Gaillon (1833) *nom. illeg.*

Nemalionopsis Skuja 1934: 191.

Subclass Ahnfeltiophycidae**Order Ahnfeltiales²³****Family Ahnfeltiaceae**

Ahnfeltia Fries 1835: 309. *nom. cons.*

Synonyms: *Sterrocolax* F. Schmitz (1893); *Porphyrodiscus* Batters (1897)

Note: Farnham and Fletcher (1976) demonstrated that *Porphyrodiscus* is a stage in the life history of *Ahnfeltia*.

Order Pihellales²⁴**Family Pihellaceae**

Pihiella Huisman, A.R. Sherwood et I.A. Abbott 2003: 981.

Note: This new genus was established by Huisman et al. (2003) on the basis of what had earlier been called "monosporangial discs" and thought to be part of the life history of species of *Liagora*. Evidence, including DNA sequence data, was presented showing them to be unrelated to their hosts. This odd red alga is less than 1 mm in size and is present as epiphytes and endophytes on its hosts, which are members of the family Liagoraceae (Huisman et al. 2007).

Subclass Rhodymeniophycidae**Order Bonnemaisoniales****Family Bonnemaisoniaceae**

Asparagopsis Montagne in Webb and Berthelot 1841: xv.

Synonyms: *Falkenbergia* F. Schmitz in Engler and Prantl (1897); *Lictoria* J. Agardh (1841)

Note: By means of culturing studies, Feldmann and Feldmann (1942) recognized *Asparagopsis armata* Harvey and *Falkenbergia rufolanosa* (Harvey) F. Schmitz to

²¹ Fredericq, J. Norris, and Pueschel (in Fredericq and Norris 1995) established the new order Rhodogorgonales and new family Rhodogorgonaceae. See footnote 9 for a recent hierarchical change.

²² Müller et al. (2002) offered evidence for the establishment of this new order.

²³ Maggs and Pueschel (1989) presented evidence to justify the recognition of both the family Ahnfeltiaceae and this order. *Ahnfeltia* had been included within the Phyllophoraceae of the Gigartinales by Kylin (1956).

²⁴ Huisman et al. (2003) established a new family and order to accommodate their new genus *Pihiella*.

represent gametophytic and tetrasporangiate phases, respectively, in the same life history.

Bonnemaisonia C. Agardh 1822: 196.

Synonyms: *Trilliella* Batters (1896); *Hymenoclonium* Batters (1895)

Note: Feldmann and Feldmann (1942) demonstrated that *Trilliella intricata* Batters is the tetrasporangiate phase in the life history of *Bonnemaisonia hamifera* Hariot.

Delisea J.V. Lamouroux in Cuvier 1819: 41.

Synonyms: *Bowiesia* Greville (1830); *Calocladia* Greville in Lindley (1836); *Chondrodon* Kützinger (1847)

Note: See Silva (1957b) for nomenclatural remarks concerning the relationship of *Thysanocladia* to *Delisea* and why *Thysanocladia* is treated as an illegitimate name.

Leptophyllis J. Agardh 1876: 674.

Pleuroblepharidella M.J. Wynne 1980c: 326.

Synonym: ***Pleuroblepharis*** M.J. Wynne (1970b) *nom. illeg.* (non Baillon, 1890)

Ptilonia (Harvey) J. Agardh 1852: 773.

Note: Chihara and Yoshizaki (1978) and Chihara (1979) proposed the merger of *Ptilonia* with *Delisea*. On the basis of studying half a dozen New Zealand taxa of these genera, Bonin and Hawkes (1988) disagreed with the proposed merger.

Family Naccariaceae

Atractophora P. Crouan et H. Crouan 1848: 371.

Liagorothamnion Huisman, D.L. Ballantine et M.J. Wynne 2001: 507.

Note: Although this genus was assigned to the Ceramiales when it was described, Schils et al. (2003) later presented evidence that its correct placement is within the Naccariaceae.

Naccaria Endlicher 1836: 6.

Synonym: *Chaetospora* C. Agardh (1824) *nom. illeg.* (non R. Brown 1810); *Wiggia* Harvey (1838) *nom. illeg.*; *Ardissonaea* J. Agardh (1899) *nom. illeg.* (non De Notaris 1870); *Neoardissonaea* [*“Neoardissonia”*] Kylin (1956)

Note: Womersley and Abbott (1968) showed that the monotypic genus *Neoardissonaea* cannot be maintained as distinct from *Naccaria*.

Reticulocaulis I.A. Abbott 1985a: 555.

Order Ceramiales

Family Ceramiaceae

Acrothamnion J. Agardh 1892: 23.

Acrothamniopsis Athanasiadis et Kraft in Athanasiadis 1996: 92.

Aglaothamnion Feldmann-Mazoyer 1941: 451.

Note: Although Kylin (1956) had recognized *Aglaothamnion* as distinct from *Callithamnion*, Dixon and Price (1981) proposed to treat *Aglaothamnion* as congeneric

with *Callithamnion*. L'Hardy-Halos and Rueness (1990) argued for the recognition of *Aglaothamnion* as distinct from *Callithamnion* on the basis of a single nucleus per vegetative cell. Maggs et al. (1991) likewise offered strong arguments for the recognition of *Aglaothamnion*. Later, the results of gene-sequencing analyses led McIvor et al. (2002) to conclude that there is “no easy answer” on whether to separate *Aglaothamnion* and *Callithamnion* in that *Aglaothamnion* proved to be paraphyletic.

Amoenothamnion E.M. Wollaston 1968: 376.

Anisoschizus Huisman et Kraft 1982: 185.

Anotrichium Nägeli 1862: 397.

Synonym: *Stephanocomium* Kützinger (1862)

Antarcticothamnion R.L. Moe et P.C. Silva 1979: 402.

Antithamnion Nägeli 1847: 200.

Antithamnionella Lyle 1922: 347.

Ardreanema R.E. Norris et I.A. Abbott 1992: 453.

Aristoptilon Hommersand et W.A. Nelson in Hommersand et al. 2006: 214.

Baldockia A. Millar 1986: 87.

Balliella Itono et Tak. Tanaka 1973: 249.

Synonym: ***Bakothamnion*** van den Hoek (1978)

Note: Van den Hoek (in Young 1981) later regarded his *Bakothamnion* as belonging to *Balliella*.

Boreothamnion M.J. Wynne 1980a: 209.

Bornetia Thuret 1855: 159.

Calliclavula C.W. Schneider in Searles and Schneider 1989: 732.

Callidictyon J.N. Norris, I.A. Abbott et Agegian 1995: 193.

Callithamniella Feldmann-Mazoyer 1938: 1120.

Callithamnion Lyngbye 1819: xxxi, 123.

Synonyms: *Aristothamnion* J. Agardh (1892); *Ceratothamnion* J. Agardh (1892); *Dasythamnion* Nägeli (1862); *Dorythamnion* Nägeli (1862); *Leptothamnion* Kützinger (1848); *?Phlebothamnion* Kützinger (1843); *Poecilothamnion* Nägeli (1847)

Note: McIvor et al. (2002) presented evidence for the transfer of *Aristothamnion collabens* (Rudolphi) Papenfuss, the type of the genus, to *Callithamnion*. Also see Note under *Dasythamniella* for an explanation of the status of *Dasythamnion*, which is treated as congeneric with *Callithamnion*.

Campylaephora J. Agardh 1851: 149.

Note: Boo and Lee (1994) provided a review of recent treatments of *Campylaephora*.

***Carpoblepharis* Kützing 1843: 449.**

Synonym: *Cyclospora* J. Agardh (1892)

Note: Wynne (1985b) presented evidence that *Cyclospora*, based on *C. curtissiae* J. Agardh and described from Florida, was not a member of the Delesseriaceae but was more correctly assigned to the Ceramiaceae. It conforms to the genus *Carpoblepharis*.

***Carpothamnion* Kützing 1849: 668.**

Synonym: *Thamnocarpus* Harvey in W.J. Hooker 1844 *nom. illeg.* (non Kützing 1843)

Note: According to Hommersand et al. (2004), the original account of *Carpothamnion molle* by Wollaston (1992, as *Thamnocarpus mollis*) was based on two separate species. Based on the holotype, this species was transferred by Hommersand et al. (2004) to *Euptilota*, whereas the second species corresponds to *Sciurothamnion stegengae*.

***Centroceras* Kützing 1841: 731.**

***Centrocerocolax* A.B. Joly 1966: 73.**

Ceramium* Roth 1797: 146. *nom. cons.

Synonyms: *Gaillonia* Rudolphi (1831) *nom. illeg.* (non *Gaillona* Bonnemaison, 1828, nec *Gaillonia* A. Richard ex A.D. De Candolle, 1830); *Acanthoceras* Kützing (1842); *Boryna* Grateloup ex Bory de St.-Vincent (1822); *Celeceras* Kützing (1849); *Ceramothonnion* H. Richards (1901); *Dictiderma* Bonnemaison (1822); *Echinoceras* Kützing (1841); *Episperma* Rafinesque (1814); *Gongroceras* Kützing (1841); *Herpoceras* C.E. Cramer (1863); *Hormoceras* Kützing (1841); *Pteroceras* Kützing (1849) (non Hasselt ex Hasskarl 1842); *Trichoceras* Kützing (1849)

Note: Although Kylin (1956) recognized *Ceramothonnion* as distinct from *Ceramium*, Feldmann-Mazoyer (1941) offered evidence for subsuming it within *Ceramium*.

***Compsothamnion* Nägeli 1862: 326, 342.**

***Compsothamnionella* Itono 1977: 42.**

***Corallophila* Weber-van Bosse 1923: 339.**

Synonym: *Ceramiella* Børgesen (1933)

Note: Kylin (1956) had recognized *Ceramiella*. Hommersand (1963) proposed to treat *Ceramiella* as congeneric with *Ceramium*. Norris (1993) proposed criteria to recognize *Corallophila* as a genus distinct from *Centroceras* and *Ceramium*. He also proposed to treat Børgesen's *Ceramiella* as synonymous with *Corallophila*. He offered a revised description of *Corallophila*.

***Crouania* J. Agardh 1842: 83.**

***Crouanophycus* Athanasiadis 1998: 517.**

Synonym: ***Crouaniella*** Athanasiadis (1996) *nom. illeg.* [non (P.A. Saccardo) Lambotte 1888]

***Dasyphila* Sonder 1845: 53.**

***Dasyptilon* G. Feldmann 1950: 308.**

***Dasythamniella* P.C. Silva 1970: 942.**

Synonym: *Dasythamnion* J. Agardh (1894) *nom. illeg.* (non Nägeli 1862)

Note: Kylin (1956) recognized J. Agardh's *Dasythamnion*. According to Silva (1970), Nägeli (1862) treated his own *Dasythamnion* as a subgenus (of *Callithamnion*) in his key, but as a genus in the text. So Silva regarded it as a generic name, making J. Agardh's *Dasythamnion* a later homonym.

***Delesseriopsis* Okamura 1931: 43.**

***Desikacharyella* B. Subramanian 1984: 11.**

***Deucalion* Huisman et Kraft 1982: 178.**

***Diapse* Kylin 1956: 390.**

***Diplothamnion* A.B. Joly et Yamaguishi in Joly et al. 1966 ['1965']: 169.**

***Dohrniella* Funk 1922: 232.**

Synonym: *Actinothamnion* W.R. Taylor in Taylor et Arndt (1929)

Note: Although Kylin (1956) was aware of Feldmann-Mazoyer's (1941) proposal to treat *Actinothamnion* as congeneric with *Dohrniella*, he still recognized both genera. Taylor (1960) accepted Feldmann-Mazoyer's treatment of *Actinothamnion* as congeneric with *Dohrniella*.

***Drewiana* E.M. Gordon 1972: 100.**

***Elisiella* Womersley 1998: 193.**

***Episporium* Moebius 1885: 78.**

Note: Although a recent treatment detailed the features of this parasitic genus (Kraft and Abbott 2002), its position in the Ceramiaceae was still considered provisional, as it had been by Pocock (1956) and Womersley (1998).

***Euptilocladia* E.M. Wollaston 1968: 269.**

***Euptilota* Kützing 1849: 671.**

Note: In their taxonomic revision of *Euptilota*, Hommersand et al. (2004) recognized four species as being included in it, while excluding two other species.

Falklandiella* Kylin 1956: 391. *nom. cons.

***Gattyia* Harvey 1855: 555.**

***Georgiella* Kylin 1956: 391.**

***Gordoniella* Itono 1977: 53.**

***Grallatoria* M. Howe 1920: 560.**

Griffithsia* C. Agardh 1817: xxviii. ['Griffitsia'] *nom. et orth. cons.

Synonyms: *Ascocladium* Nägeli (1861); *Heterosphondylium* Nägeli (1861); *Pandorea* J. Agardh (1876) *nom. illeg.* [non (Endlicher) Spach 1840]; *Pandorella* G. Feldmann (1947); *Polychroma* Bonnemaison (1822)

***Guiryella* Huisman et Kraft 1992: 128.**

Gulsonia Harvey 1865: 334.

Synonym: *Crouaniopsis* Feldmann et G. Feldmann (1940)

***Gymnophycus* Huisman et Kraft 1983: 285.**

Gymnothamnion J. Agardh 1892: 27.

Haloplegma Montagne 1842: 258.

Synonym: *Rhodoplexia* Harvey in Hooker (1844)

***Halosia* Cormaci et G. Furnari 1994: 20.**

Halurus Kützing 1843: 374.

Herpochondria Falkenberg in Engler and Prantl 1897: 435.

Heteroptilon Hommersand in Hommersand et al. 2006: 209.

Heterothamnion J. Agardh 1892: 25.

Hirsutithallia E.M. Wollaston et Womersley in Womersley 1998: 250.

Hollenbergia E.M. Wollaston 1972: 81.

Inkyuleea H.-G. Choi, Kraft et G.W. Saunders 2000: 284–285.

Interthamnion E.M. Gordon 1972: 135.

Involucrana Baldock et Womersley 1968: 214–215.

Irtugovia Perestenko 1994: 204.

Lasiothalia Harvey 1855: 558.

Laurenciophila Stegenga 1986: 130.

Lejolisia Bornet 1859: 91.

Leptoklonion Athanasiadis 1996: 183.

Lomathamnion E.M. Gordon 1972: 125.

Lophothamnion J. Agardh 1892: 42.

Macrothamnion E.M. Wollaston 1968: 328.

Mazoyerella Gordon-Mills et Womersley 1974: 134.

Medeiothamnion Pujals 1970: 290.

Synonym: ***Mazoyera*** E.M. Gordon (1970)

Microcladia Greville 1830: I.

Monosporus Solier in Castagne 1845: 242.

Synonyms: *Corynospora* J. Agardh (1851); *Neomonospora* Setchell et N.L. Gardner (1937)

Note: In agreement with Baldock (1976), Huisman and Kraft (1982) found evidence among propagule-forming genera to maintain the form genus *Monosporus*. Huisman and Gordon-Mills (1994) were the first to report sexual reproduction in one entity presently assigned to this genus.

Mortensenia Weber-van Bosse 1926: 120.

Muellerena F. Schmitz in Engler and Prantl 1897: 496.

Synonym: *Muellerella* F. Schmitz ex Kylin (1956), *nom. illeg.*

Neoptilota Kylin 1956: 392.

Nwynea Searles in Searles and Schneider 1989: 739.

Ochmapexus Womersley 1998: 230.

Ossiella A. Millar et I.A. Abbott 1997: 89.

Perikladosporon Athanasiadis 1996: 137.

Perischelia J. Agardh ex Kylin 1956: 397.

Perithamnion J. Agardh 1892: 28.

Pleonosporium Nägeli 1862: 326, 339. *nom. cons.*

Synonyms: *Elisabethia* Trevisan (1855); *Halothamnion* J. Agardh (1876) [*'Halithamnion'*]; *Morothamnion* Cramer (1862)

Plumaria F. Schmitz 1896: 5. *nom. cons.*

Plumariella Okamura 1930: 24.

Plumariopsis De Toni 1903: 1385.

Pseudocrouania Funk 1955: 115.

Note: This genus was considered as congeneric with *Crouania* by Boudouresque and Perret-Boudouresque (1987). For a discussion of its taxonomic value, see Note 40 in the paper by Gómez Garreta et al. (2001).

Pseudospora Schiffner 1931: 168.

Note: This genus was considered as “Inquirendum” by both Gómez Garreta et al. (2001) and Hommersand et al. (2006).

Psilothallia F. Schmitz in Engler and Prantl 1897: 496.

Pterocladopsis Ercegovic 1963: 37, 53, 54.

Pterothamnion Nägeli in Nägeli and C. Cramer 1855: 66. Synonyms: *Platythamnion* J. Agardh (1892); ***Glandothamnus*** Wollaston (1981); and also possibly *Sporacanthus* Kützing (1855)

Note: This genus, treated by Kylin (1956) as congeneric with *Antithamnion*, was resurrected by Wollaston (1979) and Moe and Silva (1980). Athanasiadis and Kraft (1994) proposed the merger of *Glandothamnus* and *Platytham-*

nion within *Pterothamnion*, and they treated *Sporacanthus*, a genus treated by Kylin (1956) as congeneric with *Antithamnion*, as a possible synonym of *Pterothamnion*.

Ptilocladia Sonder 1845: 52.

Synonym: ***Gulsoniopsis*** Hommersand (1963)

Note: Wollaston (1968) proposed this synonymy.

Ptilocladopsis Berthold 1882: 518.

Ptilota C. Agardh 1817: xix, 39. *nom. cons.*

Synonyms: *Calopteris* Bachelot de la Pylaie (1830, '1829'); *Pterota* Cramer (1864) *nom. illeg.* (non P. Browne, 1756)

Ptilothamnion Thuret in Le Jolis 1863: 118.

Synonym: ***Anfractutofilum*** Cribb (1965)

Note: Bourrelly (1985) first strongly suggested *Anfractutofilum* to be congeneric with *Ptilothamnion*, an idea that was later accepted by Entwisle and Foard (1999) and Kumano (2002).

Ptilothamniopsis P.S. Dixon 1971: 61.

Radiathamnion Gordon-Mills et Kraft 1981: 129.

Reinboldiella De Toni 1895b: 35.

Synonym: *Gloiothamnion* Reinbold (1895)

Rhipidothamnion Huisman 1985a: 55.

Rhodocallis Kützinger 1847: 36.

Rhododictyon W.R. Taylor 1961: 278.

Note: When Taylor (1961) described this genus, he lacked reproductive specimens and therefore tentatively assigned it to the Dasyaceae. Later, Schneider (1975) provided evidence from the apical organization and the position of the tetrasporangia to place the genus in the Rhodomelaceae.

Scagelia E.M. Wollaston 1972: 88.

Scageliopsis E.M. Wollaston 1981: 109.

Scagelonema R.E. Norris et M.J. Wynne 1969: 139.

Scagelothamnion Athanasiadis 1996: 80.

Sciurothamnion De Clerck et Kraft in De Clerck et al. 2002: 1177.

Note: According to Hommersand et al. (2004), the original account of *Carpothamnion molle* by Wollaston (1992, as *Thamnocarpus mollis*) was based on two separate species. Sexual plants from Tanzania included in Wollaston's account correspond to *Sciurothamnion stegengae*.

Seagrielfia Stegenga, Bolton et R.J. Anderson 1997: 450.

Seiropsora Harvey 1846: 1.

Synonyms: *Leptothamnion* Kützinger (1849); *Sporoseira* Ruprecht (1851) *nom. illeg.*; *Miscosporium* Nägeli (1862); *Microthamnion* J. Agardh (1892) *nom. illeg.* (non Nägeli 1849)

Shepleya E.M. Gordon 1972: 69.

Skeletonella A. Millar et De Clerck 2007: 64.

Spencerella Darbishire 1896: 199.

Note: Kylin (1956) placed this genus in his category of "Insufficiently Known Ceramiaceae." It has not been found since its original collection from Western Australia.

Spermothamnion Areschoug 1847: 334.

Synonym: *Herpothamnion* Nägeli (1862)

Sphondylothamnion Nägeli 1862: 380.

Spongoclonium Sonder 1853: 515.

Synonym: *Mesothamnion* Børgesen (1917)

Note: Womersley and Wollaston (in Womersley 1998) treated *Mesothamnion* as congeneric with *Spongoclonium*, which is contrary to R. Norris' (1985) earlier treatment of it as congeneric with *Pleonosporium*. For further discussion of the delineation of these and related genera, see Note 104 in Wynne (2005a).

Spyridia Harvey in W.J. Hooker 1833: 259, 336.

Synonym: *Bindera* J. Agardh (1841) *nom. illeg.* (non Rafinesque 1838)

Spyridiocolax A.B. Joly et E.C. Oliveira 1966: 116.

Sympodothamnion Itono 1977: 28.

Syringocolax Reinsch 1875: 66.

Tanakaella Itono 1977: 46.

Tetrathamnion E.M. Wollaston 1968: 360.

Tiffaniella Doty et Meñez 1960: 135.

Tokidaea T. Yoshida 1974: 67.

Trithamnion E.M. Wollaston 1968: 388.

Vickersia Karsakoff 1896: 285.

Warrenia Harvey ex Schmitz et Hauptfleisch in Engler and Prantl 1897: 492.

Wollastoniella E.M. Gordon 1972: 88.

Wrangelia C. Agardh 1828: 136.

Synonyms: *Bracebridgea* J. Agardh (1894); *Haliacantha* J. Agardh (1899)

Zonariophila Stegenga 1996: 126.

Family Delesseriaceae

Abroteia J. Agardh 1876: 692.

Note: In their delineation of the new genus *Nancythalia*, Millar and Nelson (2002) provided new information on *Abroteia*.

Acrosorium Zanardini ex Kützing 1869: 4.

Anisocladella Skottsberg 1923: 39.

Apoglossocolax Maggs et Hommersand 1993: 206.

Apoglossum J. Agardh 1898: 190. 1898.

Synonym: *Phrix* J.G. Stewart (1974)

Note: Wynne (1985a) presented evidence supporting the merger of *Phrix* within *Apoglossum*.

Arachnophyllum Zanardini 1843: 46.

Asterocolax Feldmann et G. Feldmann 1951: 1137.

Augophyllum S.-M. Lin, Fredericq et Hommersand 2004: 964.

Austrofolium M.J. Wynne 1988: 117.

Bartoniella Kylin 1924: 11.

Botryocarpa Greville 1830: xlix.

Botryoglossum Kützing 1843: 446.

Branchioglossum Kylin 1924: 8. 1924.

Calloseris J. Agardh 1898: 210.

Caloglossa (Harvey) G. Martens 1869: 234, 237. *nom. cons.*

Synonym: *Apiarium* Durant, 1850. *nom. rej.*

Note: According to Silva et al. (1996), credit for elevating Harvey's (1853) subgenus *Caloglossa* to generic level is to be given to Martens (1869) rather than to J. Agardh (1876). Silva's (2004) proposal to conserve the name *Caloglossa* against *Apiarium* was accepted (Compère 2005, McNeill et al. 2006b).

Calonitophyllum Aregood 1975: 348.

Chauviniella Papenfuss 1956: 159.

Note: See Note under *Phitymophora*.

Cladodonta Skottsberg 1923: 36.

Claudea J.V. Lamouroux 1813: 121.

Synonyms: *Lamourouxia* C. Agardh (1817) *nom. rej.*; *Oneillia* C. Agardh (1822)

Congregatocarpus Mikami 1971: 245.

Synonym: *Okamurina* Zinova (1972)

Note: See Note under *Heteroglossum*.

Crassilingua Papenfuss 1956: 160.

Synonym: *Pachyglossum* J. Agardh (1894) *nom. illeg.* (non Decaisne 1838)

Cryptopleura Kützing 1843: 444. *nom. cons.*

Synonyms: *Papyracea* Stackhouse 1809 *nom. rej.*; *Hymenophylla* Stackhouse (1816); *Dawsonia* Palisot de

Bauvois ex J.V. Lamouroux in Bory de St.-Vincent (1824) *nom. illeg.* (non R. Brown 1811); *Aspidophora* Montagne (1854)

Note: Wynne (2001b) presented evidence for proposing the merger of *Aspidophora* within *Cryptopleura*.

Cumathamnion M.J. Wynne et K. Daniels 1966: 26.

Delesseria J.V. Lamouroux 1813: 122. *nom. cons.*

Synonyms: *Hydrolapatha* Stackhouse (1809); *Hydrophylla* Stackhouse (1816); *Sterphalia* Dumortier (1822); *Wormskioldia* Sprengel (1827) *nom. illeg.* (non Thonning in Schumacher 1827); *Maugeria* S.O. Gray (1867); *Paraglossum* J. Agardh (1898)

Dicroglossum A. Millar et Huisman 1996: 128.

Drachiella J. Ernst et Feldmann 1957: 477.

Duckerella M.J. Wynne 1982: 241.

Erythroglossum J. Agardh 1898: 174.

Synonym: *Schizoneura* (J. Agardh) J. Agardh (1898) *nom. illeg.* (non Schimper et Mougeot 1844)

Note: Kylin (1956) treated *Schizoneura* as an insufficiently known genus of the Delesseriaceae. According to Ardré (1970a) the genus is congeneric with *Erythroglossum*.

Frikkiella M.J. Wynne et C.W. Schneider 1996: 78.

Gonimocolax Kylin 1924: 61.

Gonimophyllum Batters 1892: 65.

Grinnellia Harvey 1853: 91.

Halicnide J. Agardh 1898: 201.

Haraldia Feldmann 1939: 5.

Haraldiophyllum Zinova 1981: 12.

Hemineura Harvey 1849: 116.

Heterodoxia J. Agardh 1898: 127.

Heteroglossum Zinova 1972: 67.

Synonyms: *Yamadaphycus* Mikami (1973); *Okamurina* Zinova (1976) *nom. illeg.* (non Zinova 1972)

Note: Zinova (1972) first established *Okamurina* with the same type species that was the basis of Mikami's (1971) *Congregatocarpus*. Zinova (1976) attempted to re-use the name *Okamurina* by rejecting the original type and basing it on the new species *O. rigida* Zinova. But this second usage is to be treated as a later homonym.

Hideophyllum Zinova 1981: 14.

Holmesia J. Agardh 1890: 37.

Synonym: *Loranthophycus* E.Y. Dawson (1944b)

Hymenena Greville 1830. xlviii.

Hypoglossum Kützing 1843: 444.

Kurogia T. Yoshida 1979: 88.

Laingia Kylin 1929: 5.

Marionella F. Wagner 1954: 303.

Martensia Hering 1841: 92. *nom. cons.*

Synonyms: *Hemitrema* R. Brown ex Endlicher (1843); *Mesotrema* J. Agardh (1854); *Opephyllum* F. Schmitz in Schmitz and Hauptfleisch (1897); *Capraella* G. DeToni (1936); **Neomartensia** T. Yoshida et Mikami (1996a)

Note: Lin et al. (2001) proposed the merger of *Opephyllum* and *Neomartensia* within *Martensia*.

Membranoptera Stackhouse 1809: 57, 85.

Synonyms: *Hypophylla* Stackhouse (1816); *Pteridium* (Kützing) J. Agardh (1898) (non Gleditsch ex Scopoli 1760)

Microrhinus Skottsberg 1923: 28.

Mikamiella M.J. Wynne 1977: 388.

Myriogramme Kylin 1924: 55.

Nancythalia A. Millar et W.A. Nelson 2002: 248.

Neoholmesia Mikami 1972: 88.

Synonym: **Sachalinella** Zinova (1972)

Neohypophyllum M.J. Wynne 1983: 445.

Synonym: *Hypophyllum* Kylin (1924) *nom. illeg.* (non Earle 1909)

Neuroglossum Kützing 1843: 446.

Nienburgella Perestenko 1994: 168, 205.

Nienburgia Kylin 1935: 230.

Synonym: *Heteronema* Kylin (1924) *nom. illeg.* (non Dujardin 1841)

Nitophyllum Greville 1830: xlvii. *nom. cons.*

Synonyms: *Scutarius* Roussel (1806); *Aglaophyllum* Montagne in Orbigny (1839); *Aeglophyllum* Kützing (1843) *orth. var.*; *Schizoglossum* Kützing (1843) *nom. illeg.* (non Meyer 1838)

Nitospinosa Womersley 2003: 83.

Odontolaingia M.L. Mendoza 1976a: 191.

Pantoneura Kylin in Kylin and Skottsberg 1919: 47.

Papenfussia Kylin 1938: 15.

Synonym: *Rhodoseris* W. Harvey 1860 *nom. illeg.* (non Turczaninow, 1851)

Note: Womersley (2003) summarized the confused nomenclatural history of *Papenfussia* and *Pollexfenia* (Rhodomelaceae). When Harvey (1844) described *Pollex-*

fenia, he described new species from South Africa and southern Australia. When Kylin (1938) established *Papenfussia* in the Delesseriaceae, he typified his new taxon using the South African Harvey species, *Pollexfenia pedicellata*, and retained *Pollexfenia* for the Australian *P. laciniata*. In their treatments of these two genera, neither Kylin (1956) nor Papenfuss (1942) referred to Harvey's (1844) protologue for *Pollexfenia*, which agrees more with *P. pedicellata* than with *P. laciniata*. Because Art. 10.5 (b) of the ICBN requires that the type must not be in conflict with the protologue, one must conclude that *P. pedicellata* from southern Australia must be the type of *Pollexfenia* and that the South African taxon should be correctly known as *Papenfussia laciniata*.

Patulophycus A. Millar et M.J. Wynne 1992a: 414.

Phitycolax M.J. Wynne et F.J. Scott 1989: 28.

Phitymophora J. Agardh 1898: 173.

Synonyms: *Chauvinia* Harvey (1862) *nom. illeg.*, (non Bory de Saint-Vincent in Duperrey 1829); *Vinassaella* G. De Toni (1936).

Note: Kylin (1956) recognized the genus *Vinassaella* [as 'Vinassella'] as a substitute name for *Chauvinia* Harvey, using the name *V. coriifolia* (Harvey) G. DeToni as the type. Papenfuss (1956), however, pointed out that as a substitute name for *Chauvinia*, *Vinassaella* must take the same type, namely, *C. imbricata* (Areschoug) Harvey, which is the type of *Phitymophora*. Papenfuss (1956) was obligated to place *Delesseria coriifolia* Harvey in a new genus, which he called *Chauvinella*.

Phycodrira M.J. Wynne 1985c: 79.

Phycodrys Kützing 1843: 444.

Platyclinia J. Agardh 1898: 103.

Polycoryne Skottsberg in Kylin and Skottsberg 1919: 36.

Polyneura (J. Agardh) Kylin 1924: 33. *nom. cons.* *Nitophyllum* subg. *Polyneura* J. Agardh (1898).

Synonym: **Searlesia** C.W. Schneider et Eiseman (1979)
Note: Yoshida and Mikami (1991) proposed to treat *Searlesia* as congeneric within *Polyneura*.

Polyneurella E.Y. Dawson 1944: 322.

Polyneuropsis M.J. Wynne, McBride et J.A. West 1973: 247.

Pseudobranchioglossum M. Bodard 1971: 29.

Pseudogrinnellia M.J. Wynne 1999: 37.

Pseudolaingia Levring 1944: 19.

Pseudonitophylla M.L. Mendoza 1975: 61.

Pseudophycodrys Skottsberg 1923: 32.

***Radicilingua* Papenfuss 1956: 160.**

Synonym: *Rhizoglossum* Kylin (1924) *nom. illeg.* (non Presl 1845)

***Robea* Womersley 2003: 91.**

Schizoseris Kylin 1924: 67.

Sorella Hollenberg 1943: 577.

***Sorellocolax* T. Yoshida et Mikami 1996b: 127.**

***Sympodophyllum* Shepley et Womersley 1960: 386.**

Taenioma J. Agardh 1863: 1256.

***Tokidadendron* M.J. Wynne 1970c: 107.**

***Tsengiella* J.F. Zhang et B.M. Xia 1987: 132.**

***Valeriemaya* A. Millar et M.J. Wynne 1992b: 132.**

Vanvoorstia Harvey in Hooker 1854: 144.

Synonyms: *Sonderia* F. Mueller in J. Agardh (1890); *Implicaria* Heydrich (1902)

***Womersleya* Papenfuss 1956: 160.**

Synonym: *Chondrophyllum* Kylin (1924) *nom. illeg.* (non Necker 1790)

Yendonia Kylin 1935: 231. 1935.

Synonym: *Ruprechtella* Kylin (1924) *nom. illeg.* (non Yendo 1913)

***Yoshidaphycus* Mikami 1992: 390.**

Zellera Martens 1868: 33.

***Zinovaea* M.J. Wynne 1970c: 136.**

Family Sarcomeniaceae²⁵

Cottoniella Børgesen 1919: 333.

***Dotyella* Womersley et Shepley 1959: 210.**

***Malaconema* Womersley et Shepley 1959: 210.**

Platysiphonia Børgesen 1931: 28.

Sarcomenia Sonder 1845: 56.

***Sarcotrichia* Womersley et Shepley 1959: 209.**

Family Dasyaceae

Amphisbetema Weber-van Bosse 1913: 133.

Colacodasya F. Schmitz in Engler and Prantl 1897: 473.

Dasya C. Agardh 1824: xxxiv, 211 ('*Dasia*'); corr. C. Agardh 1828: 116 (*nom. et orth. cons.*)

Synonyms: *Baillouviana* Adanson (1763); *Rhodonema* Martens (1824); *Stichocarpus* C. Agardh (1827); *Eupogonium* Kützinger (1843); *Endogenia* J. Agardh (1897); *Pogonophorella* P.C. Silva (1952)

Note: According to Millar (1996), an examination of the type species of *Pogonophorella* showed it to be inseparable from species of *Dasya* "in all essential details". *Endogenia*, which was treated by Kylin (1956) as an insufficiently known genus of Dasyaceae, was placed by Womersley (2003) in the synonymy of *Dasya*. He was able to determine that the type specimen of *Endogenia gracilaria* J. Agardh was merely a denuded plant of *Dasya villosa* Harvey.

Dasyella Falkenberg 1901: 656.

Note: This monotypic genus, which had been known only from the original non-reproductive collection made in 1881, was re-discovered by Coppejans and Boudouresque (1984), who described female gametophytic and tetrasporangiate material for the first time. They were able to confirm its unique systematic position.

***Dasysiphonia* I.K. Lee et J.A. West 1980: 115.**

Dictyurus Bory de St.-Vincent in Bélanger 1834: 170.

Synonym: *Calidictyon* Greville in Lindley (1836), not *Calidictyon* [Ceramiaceae]

***Dipterocladia* Y.S.D.M. de Jong in de Jong, Prud'homme van Reine et Lokhorst 1997: 423.**

Eupogodon Kützinger 1845: 312.

Synonym: *Dasyopsis* (Montagne) Montagne in d'Orbigny (1847)

Note: Kylin (1956) recognized *Dasyopsis* with *Eupogodon* in synonymy. But Silva (in Silva et al. 1987) realized that as a generic name *Eupogodon* has priority. Millar (1996) recognized *Eupogodon* as having a primary bilateral organization in contrast to the primarily radial organization of *Dasya*. According to de Jong (1997) and de Jong et al. (1997), however, the type of *Eupogodon*, *E. planus* (C. Agardh) Kützinger, has primary radial symmetry and later develops bilateral symmetry, resulting in an alternate branching pattern.

Halydictyon Zanardini 1843: 52.

Synonyms: *Coelodictyon* Kützinger (1845); *Hanovia* Sonder (1845)

Note: Kylin (1956) and others had this name as "*Halodictyon*", but Zanardini's original orthography has been restored (Silva et al. 1996). *Halodictyon* Kützinger (1843) is a later synonym of *Hydroclathrus* Bory de St.-Vincent (Scytosiphonaceae, Phaeophyceae). Kylin (1956) had followed earlier workers in placing *Halydictyon* in the Rhodomelaceae, but he had doubts as to its true affinities in the family. Based on vegetative and reproductive features, Coppejans (1975) later concluded that it was a better fit in the Dasyaceae, but he too had some doubt as to its true relationships in the Ceramiales. Choi et al. (2002) provided the SSU rDNA sequence of the type spe-

²⁵ Womersley (2003) provided evidence for separating the tribe Sarcomeniaceae from the Delesseriaceae into its own family.

cies, *H. mirabile* Zanardini, in their phylogenetic trees and found that it did not resolve with strong support to any lineage. Using a cladistic analysis of anatomical features for many members of the Ceramiales, Choi et al. (2002) provisionally placed *Halydictyon* in a new subfamily of the Dasyaceae with *Dictyurus*, *Heterosiphonia* and *Thuretia*.

Heterosiphonia Montagne 1842: 4. *nom. cons.*

Synonyms: *Ellisius* S.F. Gray (1821) *nom. rej.*; *Asperocaulon* Greville (1824); *Trichothamnion* Kützinger (1843); *Merenia* Reinsch (1888)

Note: Although Kylin (1956) included *Asperocaulon* in the synonymy of *Dasya*, it was a replacement name for *Ellisius*.

Nematophora J. Agardh 1890: 33.

Note: This genus has not been found since its original collection in Australia in the late 1800s. Sympodial growth, a characteristic of the Dasyaceae, remains unreported.

Rhodoptilum (J. Agardh) Kylin 1956: 461.

Tapeinodasya Weber-van Bosse 1904: 96.

Thuretia Decaisne 1844: 236.

Family Rhodomelaceae

Abbottiella ["*Abbottella*"] Hollenberg 1967: 201.

Acanthophora J.V. Lamouroux 1813: 132.

Synonym: *Acanthochondria* Weber-van Bosse (1911)

Acrocystis Zanardini 1872: 145.

Adamsiella L.E. Phillips et W.A. Nelson in Phillips 2002b: 210.

Note: This genus was established as a segregation of two putative species from *Lenormandia* as well as of two new species from New Zealand.

Aicolax Pocock 1956: 22.

Alleynea Womersley 2003: 216.

Alsidium C. Agardh 1827: 639.

Synonyms: *Helminthochorton* Zanardini (1843); *Helminthochortos* Link (1833)

Amansia J.V. Lamouroux 1809: 332.

Synonym: ***Melanamansia*** R.E. Norris (1988b)

Note: Norris (1988b) established *Melanamansia* as a segregate genus from *Amansia* on the basis that pseudo-pericentral cells were formed in *Melanamansia*, but not in *Amansia*. Wilson and Kraft (2000) questioned the reliability of this morphological feature at the generic level, whereas N'Yeurt (2002) continued to accept Norris' (1988b) two genera, *Amansia* and *Melanamansia*. Womersley (2003), however, demonstrated that pseudo-pericentral cells are also formed in *A. multifida* J.V. Lamouroux, the type of the genus. Womersley's proposal

to merge *Melanamansia* into *Amansia* was accepted by De Clerck et al. (2005a).

Amplisiphonia Hollenberg 1939: 380.

Note: Hollenberg and Wynne (1970) offered the first observations on sexual plants. Hommersand (1963) placed this genus in the Pterosiphonieae, whereas Hollenberg and Wynne (1970) associated the genus with the Polysiphonieae.

Aneurianna L.E. Phillips 2006: 216.

Note: This genus was established by Phillips (2006) after she showed that the type of *Lenormandiopsis*, *L. latifolia*, conformed to the genus *Lenormandia*, but a new genus was needed to accommodate other species that differed generically. *Aneurianna lorentzii* was designated the type species.

Antarctocolax Skottsberg 1953: 549.

Aphanocladia Falkenberg in Engler and Prantl 1897: 444.

Note: Hommersand (1963) transferred this genus from the Pterosiphonieae to the Polysiphonieae, whereas Ardré (1970b) argued for its retention in the former tribe. Ardré (1969) has published on the vegetative organization in this genus. Kraft and Wynne (1992) also discussed the taxonomic relationships of this genus.

Ardissonula G. De Toni 1936: [3].

Synonym: *Isoptera* Okamura (1901) *nom. illeg.* (non Scheffer ex Burck 1887)

Benzaitenia Yendo 1913: 283.

Note: In a detailed study of both vegetative and reproductive development in this monotypic genus, Morrill (1976a) concluded that it is a member of the tribe Bostrychieae. Kylin (1956) had assigned it to the "*Levringiella* Gruppe", which was his catch-all category for parasitic Rhodomelaceae of uncertain affinity.

Beringiella M.J. Wynne 1980b: 221.

Boergeseniella Kylin 1956: 507.

Bostrychia Montagne in Sagra 1842: 39. 1842 *nom. cons.*

Synonyms: *Amphibia* Stackhouse (1809); *Helicothamnion* ["*Helicothamnium*"] Kützinger (1841); *Scorpioides* Roussel (1806); *Scorpiura* Stackhouse (1816); *Stictosiphonia* J.D. Hooker et Harvey in Hooker (1847)

Note: Although King and Puttock (1989) proposed to treat *Stictosiphonia* and *Bostrychia* as distinct genera, Zuccarello and West (2006) offered evidence to merge *Stictosiphonia* within *Bostrychia*, as had been done by Kylin (1956).

Bostrychiocolax Zuccarello et J.A. West 1994: 138.

Brongniartella Bory de St.-Vincent 1822: 516.

Bryocladia F. Schmitz in Engler and Prantl 1897: 442.

Bryothamnion Kützting 1843: 433.
Synonym: *Physcophora* Kützting (1843)

Chamaethamnion Falkenberg in Engler and Prantl 1897: 449.

Chiracanthia Falkenberg in Engler and Prantl 1897: 441.

Chondria C. Agardh 1817: xviii. *nom. cons.*
Synonyms: *Dasyphylla* Stackhouse (1809) *nom. rej.*; *Carpocaulon* Kützting (1843); *Chondriopsis* J. Agardh (1863)

Chondrophycus (Tokida et Y. Saito) Garbary et J.T. Harper 1998: 194.

Note: Garbary and Harper (1998) raised subgenus *Chondrophycus* (of *Laurencia*), proposed by Tokida and Saito (in Saito 1967), to generic status.

Choreocolax Reinsch 1874–1875: 61.
Note: Zuccarello et al. (2004) offered evidence to place *Choreocolax* in the Rhodomelaceae rather than in the Choreocolacaceae.

Cladhymenia J.D. Hooker et Harvey 1845: 539.

Cladurus Falkenberg in Engler and Prantl 1897: 435.

Cliftonaea Harvey 1863: pl. 279.

Coeloclonium J. Agardh 1876: 639.

Colacopsis De Toni 1903: 1170.
Synonyms: *Colaconema* F. Schmitz in Engler and Prantl (1897) *nom. illeg.* (non Batters 1896); *Melanocolax* M.T. Martin et Pocock (1953)
Note: Norris (1988a) proposed the merger of *Melanocolax* with *Colacopsis*.

Corynecladia J. Agardh 1876: 642.
Note: Although Womersley (2003) treated this genus as congeneric with *Laurencia*, Nam (2006) suggested maintaining it as a separate genus.

Ctenosiphonia Falkenberg in Engler and Prantl 1897: 466.

Dasyclonium J. Agardh 1894: 80.
Synonyms: *Euzonia* Kylin (1956); *Euzoniella* Falkenberg (1901)
Note: Kylin (1956) treated *Euzoniella* Falkenberg (1901) as congeneric with *Dasyclonium* and delineated the new genus *Euzonia*, based upon a part of Falkenberg's concept of *Euzoniella*. Scagel (1962a, 1962b) presented evidence that Kylin's recognition of this pair of genera was not justified because species attributed to both genera form an evolutionary series of closely related entities.

Dawsoniella Hollenberg 1967: 205.

Dawsoniocolax A.B. Joly et Yamaguishi-Tomita 1970: 209.

Synonym: ***Dawsoniella*** A.B. Joly et Yamaguishi-Tomita (1967) *nom. illeg.* (non Hollenberg 1967)

Dictyomenia Greville, 1830: l.

Digenea C. Agardh 1822: 388.

Diplocladia Kylin 1956: 504.

Dipterocolax J. Morrill 1977: 133.

Dipterosiphonia F. Schmitz et Falkenberg in Engler and Prantl 1897: 463.

Ditria Hollenberg 1967: 206.

Dolichoscelis J. Agardh 1899: 119.

Doxodasya Falkenberg 1901: 537.
Note: Parsons (1975) provided a detailed account of this genus.

Echinophycus Huisman 2001: 177.

Echinosporangium Kylin 1956: 537.

Echinothamnion Kylin 1956: 506.

Enantiocladia Falkenberg in Engler and Prantl 1897: 466.

Note: Phillips and De Clerck (2005) studied *Enantiocladia schottii* (W.R. Taylor) S.M. Wilson et Kraft and transferred it to *Halopithys*.

Endosiphonia Zanardini 1878: 35. 1878.
Synonym: *Pseudoendosiphonia* Weber-van Bosse (1913)

Enelittosiphonia Segi 1949: 139.
Note: This genus was not included in Kylin (1956).

Epiglossum Kützting 1849: 878.
Note: This genus, which had been regarded by Falkenberg (1901) and Kylin (1956) as congeneric with *Lenormandia*, was resurrected by Phillips (2002b).

Erythrocytis J. Agardh 1876: 638.

Erythrostachys J. Agardh ex Jean White in Ewart et al. 1912: 257.

Synonym: *Rhodolophia* (J. Agardh) Kylin 1956: 510.
Note: Womersley and Parsons (2003) explained the reasons for this proposed synonymy.

Exophyllum Weber-van Bosse 1911: 28.
Note: This rarely reported genus had been regarded by Kylin (1956) as of uncertain status. Indy et al. (2006) were able to give a complete description of the genus based on both type material and new collections of sexual and tetrasporangial plants from Indonesia (the region of the type collection). They demonstrated that this genus conformed to the Rhodomelaceae. Some North and South Pacific collections that had been thought to be *Exophyllum* by Hollenberg (1968), Abbott (1999), Payri et al. (2000), and Skelton and South (2002) were found by Indy et al. (2006) to belong to the Dasaceae.

Fernandosiphonia Levring in Skottsberg 1941: 660.

Gonatogenia J. Agardh 1896: 115.

Synonym: *Maschalostroma* F. Schmitz in Engler and Prantl (1897)

Gredgaria Womersley 2003: 314.

Halopithys Kützing 1843: 433.

Synonym: ***Digenopsis*** Simons (1970)

Note: Phillips and De Clerck (2005) presented evidence that *Digenopsis*, a genus described by Simons (1970) from South Africa and Mozambique and originally assigned to the tribe Polysiphonieae, was not distinct from *Halopithys*. Likewise, the Caribbean species *Enantiocladia schottii* was transferred to *Halopithys* by Phillips and De Clerck (2005). Those authors showed that *Halopithys* was closely related to *Rytiphlaea* but had no close relationship to *Protokuetzingia*.

Haplodasya Falkenberg in Engler and Prantl 1897: 474.

Note: Parsons (1975) provided observations on this genus and compared it to other genera in the tribe Lophothalieae.

Harveyella F. Schmitz et Reinke in Reinke 1889: 28.

Note: Zuccarello et al. (2004) offered evidence to place *Harveyella* in the Rhodomelaceae rather than in the Choreocolacaceae as done by Kylin (1956).

Hawaiia Hollenberg 1967: 209.

Herpopteros Falkenberg in Engler and Prantl 1897: 460.

Herposiphonia Nägeli 1846: 238.

Herposiphoniella Womersley 2003: 299.

Heterocladia Decaisne 1842: 359, 361.

Synonym: *Trigenea* Sonder (1845)

Note: Phillips et al. (2000) presented evidence for the treatment of *Trigenea* as congeneric with *Heterocladia* and for the maintenance of this genus in its own tribe, the Heterocladieae.

Heterodasya A.B. Joly et E.C. Oliveira 1966: 118.

Heterostroma Kraft et M.J. Wynne 1992: 17.

Holotrichia F. Schmitz in Engler and Prantl 1897: 450.

Husseyia J. Agardh 1901: 123. *nom. cons.* (non *Husseia* Berkeley 1847).

Synonyms: ***Husseyella*** Papenfuss (1958); *Rhododactylis* J. Agardh (1876)

Note: Kylin (1956) recognized *Rhododactylis* as belonging to the Hypneaceae. Silva et al. (1996: 501) provide a detailed explanation of the problems associated with the name *Rhododactylis*. The proposal for the conservation of *Husseyia* made by Silva (1995) was later recommended by the Committee on Algae (Compère 1998) and accepted.

Janczewskia Solms-Laubach 1877: 210.

Jantinella Kylin 1941: 39.

Kentrophora S.M. Wilson et Kraft in Henderson et al. 2001: 175.

Synonym: ***Plectrophora*** S.M. Wilson et Kraft (2000) *nom. illeg.* (non H. Focke, 1848)

Kintarosiphonia Uwai et Masuda 1999: 225.

Kuetzingia Sonder 1845: 54.

Laurencia J.V. Lamouroux 1813: 130. *nom. cons.*

Laurenciocolax Zinova et Perestenko 1964: 134, 136.

Leachiella P. Kugrens 1982: 307.

Note: Zuccarello et al. (2004) offered evidence to place *Leachiella* in the Rhodomelaceae. Kugrens (1982) had treated it as "*Incertae sedis*."

Lembergria Saenger in Saenger et al. 1971: 110.

Note: Phillips (2001) demonstrated that this monotypic genus from Australia is related to *Sonderella*, and she established a new tribe, Sonderelleae, to accommodate these two Australian genera.

Lenormandia Sonder 1845: 54. *nom. cons.*

Synonyms: *Areschougia* Trevisan (1845) (non Meneghini 1844, nec Harvey 1855, *nom. cons.*); *Aneuria* (J. Agardh) Weber-van Bosse (1911) (non *Aneura* Dumortier 1822);

Lenormandiopsis Papenfuss (1967)

Note: Papenfuss (1967) had proposed the new name *Lenormandiopsis* to replace *Aneuria* (J. Agardh) Weber-van Bosse. But Phillips (2002a, 2006) showed that the type species of *Lenormandiopsis*, *L. latifolia*, conformed to the generic characteristics of *Lenormandia*. So she merged *Lenormandiopsis* within *Lenormandia*. She established the new genus *Aneurianna* to accommodate three species that differed from *Lenormandia*, including *A. lorentzii* to serve as type of *Aneurianna*. Phillips (2002a) also removed the southwestern Australian species, *L. hypoglossum* J. Agardh to *Phytomophora*. Phillips (2002b) gave reasons for transferring a pair of New Zealand species of *Lenormandia* to the new genus *Adamsiella*.

Leptosiphonia Kylin 1956: 509.

Leveillea Decaisne 1839: 375.

Levringiella Kylin 1956: 517.

Lophocladia F. Schmitz 1893: 222.

Lophosiphonia Falkenberg in Engler and Prantl 1897: 459.

Synonym: *Falkenbergiella* Kylin (1938)

Note: Norris (1992) proposed the merger of *Falkenbergiella* into *Lophosiphonia*.

Lophothalia Kützinger 1849: 797.

Note: Parsons (1975) provided an account of the type species of this genus, *Lophothalia verticillata* (Harvey) Kützinger.

Lophurella F. Schmitz in Engler and Prantl 1897: 440.

Melanothamnus Bornet et Falkenberg in Falkenberg 1901: 684.

Note: Kylin (1956) treated this genus as an insufficiently known member of the Rhodomelaceae. Wynne and Banaimoon (1990) reported on new collections, the first since the original collection from Somalia, and described the multicellular propagules.

Meridiocolax J. Morrill 1976b: 233.

Note: This parasitic genus was based on a type species described from Florida (USA). Noble and Kraft (1984) added a second species that occurs at Lord Howe Island, eastern Australia.

Metamorphe Falkenberg in Engler and Prantl 1897: 445.

Microcolax F. Schmitz in Engler and Prantl 1897: 458.

Micropeuce J. Agardh 1899: 123.

Murrayella F. Schmitz 1893: 227.

Nanopera S.M. Wilson et Kraft 2000: 340.

Neorhodomela Masuda 1982: 275.

Note: Masuda (1982) delineated this genus from *Rhodomela* by the trichoblasts being dorsally arranged in *Neorhodomela* but spirally arranged in *Rhodomela*, and the spermatangia being produced on trichoblasts in *Neorhodomela* but on unmodified branched in *Rhodomela*.

Neosiphonia M.-S. Kim et I.K. Lee 1999: 272.

Note: The segregation of this genus from *Polysiphonia* has been supported by subsequent work (e.g., Choi et al. 2001, Guimarães et al. 2004).

Neotenophycus Kraft et I.A. Abbott 2002: 272.

Neurymenia J. Agardh 1863: 1134.

Odonthalia Lyngbye 1819: 9. *nom. cons.*

Synonyms: *Fimbriaria* Stackhouse (1809) *nom. rej.*; *Ato-maria* Stackhouse (1816) *nom. rej.*

Note: Masuda (1982) provided a detailed account of the Japanese species of *Odonthalia* and a comparison with representatives of the other two genera of the tribe Rhodomelaeae, namely, *Rhodomela* and *Neorhodomela*.

Oligocladella P.C. Silva in Silva et al. 1996: 530.

Synonym: *Oligocladus* Weber-van Bosse (1911) *nom. illeg.* (non R. Chodat et Wilczek 1902)

Onychocolax Pocock 1956: 31.

Ophidocladus Falkenberg in Engler and Prantl 1897: 461.

Synonym: *Rhodosiphonia* Hollenberg (1943)

Osmundaria J.V. Lamouroux 1813: 42.

Synonyms: *Epineuron* Harvey (1845); *Polyphacum* C. Agardh (1820); *Spirhymenia* Decaisne (1841)

Note: See remarks under *Vidalia*.

Osmundea Stackhouse 1809: 56, 79.

Synonym: *Pinnatifida* Stackhouse (1816)

Note: Nam et al. (1994) presented justification for the resurrection for this genus that had been treated by Kylin (1956) within the synonymy of *Laurencia*. Critical observations on *Osmundea* were also provided by Serio et al. (1999) and McIvor et al. (2003).

Pachychaeta Kützinger 1862: 11.

Note: Hommersand (1963) provided detailed observations of vegetative and reproductive characters in this South African-based genus.

Periphykon Weber van Bosse 1929: 255.

Note: New observations on this genus were provided by Joly et al. (1967) and Kraft and Wynne (1992).

Perrinia Womersley 2003: 229.

Phaeocolax Hollenberg 1967: 211.

Picconiella G. De Toni 1936: [4].

Synonyms: *Pteronia* F. Schmitz in Engler and Prantl (1897) *nom. illeg.* (non Linnaeus 1763 *nom. cons.*).

Pityophykos Papenfuss 1958: 107.

Synonym: *Pithyopsis* Falkenberg in Engler and Prantl (1897) (non *Pityopsis* Nuttall 1840)

Placophora J. Agardh 1863: 1137.

Synonyms: *Rhodopeltis* Askenasy (1872) *nom. illeg.* (non Harvey 1863); *Micramansia* Kützinger (1865)

Note: The structure and the taxonomic relationships of this genus were discussed by Hommersand (1963) and Kraft and Wynne (1992).

Pleurostichidium Heydrich 1893: 344.

Note: Hommersand (1963) established a tribe, the Pleurostichidae, for this monotypic genus. Carrying out a comparative study including an analysis of 18 S rDNA sequences of some 15 related rhodomelaceous species, Phillips (2000) concluded that this genus is closely related to the tribe Polysiphonieae and distantly related to the Amansieae, where Scagel (1953) had assigned it.

Pollexfenia Harvey 1844: 431.

Synonyms: *Jeannerettia* J.D. Hooker et Harvey in Harvey (1847) (non *Jeanneretia* Gaudichaud-Beaupré 1841); *Melanoseris* Zanardini (1874) *nom. illeg.* (non Decaisne in Jacquemont 1843)

Note: Womersley (2003) reviewed past confusion about the nomenclature of the names *Pollexfenia*, *Jeannerettia*, and *Papenfussia*, concluding that *Pollexfenia* should replace the name *Jeannerettia* and that *Papenfussia* should be reinstated as the genus of Delesseriaceae. Kraft and Wynne (1992, as *Jeannerettia*) discussed the features of this genus and its relationship to *Heterostroma* and certain other foliose genera of Rhodomelaceae.

Polysiphonia R. Greville 1823: ad. t. 90. *nom. cons.*
 Synonyms: *Carradoria* C.F.P. Martius (1833) (*nom. illeg.*); *Carradoria* Kylin (1956) (*nom. illeg.*); ***Carradoriella*** P.C. Silva in Silva et al. (1996); *Dicarpella* Bory de St.-Vincent (1823); ***Girodia*** Lestiboudois (1827); *Grammita* Bonnemaison (1822); *Grammitella* P. Crouan et H. Crouan (1848); *Grateloupella* Bory de St.-Vincent (1823) [*Gratelupella*]; *Hutchinsia* C. Agardh (1817) *nom. illeg.* (non Aiton 1812); *Orcasia* Kylin (1941); *Polyostea* Ruprecht (1850)

Note: *Girodia* was not included in Kylin (1956). *Orcasia*, recognized by Kylin (1956), has not been accepted as distinct from *Polysiphonia* by Scagel (1957), Yoshida (1998), and others. Silva (in Silva et al. 1996) explained that Kylin (1956) created the later homonym *Carradoria* when he excluded the type of the name of Martius (1833). Silva then proposed *Carradoriella* *nom. nov.* to replace *Carradoria* Kylin. Wynne (1986a) had earlier presented arguments not to recognize Kylin's *Carradoria*, based on *C. virgata*, because the suite of features could be found in the circumscription of *Polysiphonia*. Choi et al. (2001) noted that the type of *Carradoriella* shared some features with *Polysiphonia sensu stricto*, but it also joined the "Neosiphonia group" on the basis of its molecular data. According to Choi et al. (2001), it might turn out that *Neosiphonia* is to be merged within *Carradoriella*, or the two may be sister taxa. Female and male characteristics need to be understood before the relationships of these taxa are resolved.

Polyzon Suhr 1834: 739.

Protokuetzingia Falkenberg in Engler and Prantl 1897: 469.

Note: Phillips and De Clerck (2005) observed that *Protokuetzingia*, based on its Australian type, has no close affinity with *Rytiphlaea* and *Halopithys*, confirming the fundamental importance of the pericentral cell numbers in determining relationships within the Amansieae.

Pterochondria Hollenberg 1942: 532.

Pterosiphonia Falkenberg in Engler and Prantl 1897: 443.

Synonym: ***Pterosiphoniella*** E.Y. Dawson (1963b)
 Note: Hommersand (1963), Ardré (1967, 1968), and Kraft and Wynne (1992) have discussed the taxonomic relationships of this genus.

Pycnothamnion P.J.L. Dangeard 1953 [*'1952'*]: 302.
 Synonym: ***Dasythamnion*** P.J.L. Dangeard (1951) *nom. illeg.* (non Nägeli 1862).

Rhodolachne M.J. Wynne 1970a: 1780.

Rhodomela C. Agardh 1822: 368. *nom. cons.*
 Synonyms: *Fuscaria* Stackhouse (1809) *nom. rej.*; *Lophura* Kützinger (1843); *Aphanarthron* J. Agardh (1868)

Rhodomelopsis Pocock 1953: 34.

Rodriguezella F. Schmitz 1895: 157.

Rytiphlaea C. Agardh 1817: xxv.

Note: Material of the Mediterranean-based type species *Rytiphlaea tinctoria* was studied by Phillips and De Clerck (2005) and compared with related species in the tribe Amansieae.

Schizochlaenion M.J. Wynne et R.E. Norris 1982: 288.

Sinosiphonia C.K. Tseng et B.L. Zheng 1983: 356.

Sonderella F. Schmitz in Engler and Prantl 1896: 415.

Note: Assigned to the Delesseriaceae by Kylin (1956), this genus was re-assigned to the Rhodomelaceae by Womersley (1965). Phillips (2001) provided observations on both morphological and molecular data and established the tribe Sonderelleae to accommodate the two genera *Sonderella* and *Lembergia*.

Spirocladia Børgesen 1933: 14.

Spirophycus A. Millar 2000: 88.

Sporoglossum Kylin 1919: 57.

Stichothamnion Børgesen 1930: 118.

Streblacladia F. Schmitz in Engler and Prantl 1897: 457.

Stromatocarpus Falkenberg in Engler and Prantl 1897: 478.

Symphyocladia Falkenberg in Engler and Prantl 1897: 443.

Note: Ardré (1973) and Kraft and Wynne (1992) discussed the taxonomic affinities of this genus.

Tayloriella Kylin 1938: 18.

Thaumatella (Falkenberg) Kylin 1956: 511.

Tiparraria Womersley 2003: 301.

Tolypiocladia F. Schmitz in Engler and Prantl 1897: 441.
 Synonym: *Roschera* Sonder in von der Decken (1879) *nom. illeg.*, (non *Roscheria* Wendland ex Balfour 1877)

Trichidium J.M. Noble et Kraft 1984: 405.

Tylocolax F. Schmitz in Engler and Prantl 1897: 478.

Ululania Apt et Schlech 1998: 159.

Veleroa E.Y. Dawson 1944: 335.

Synonyms: ***Lynkiella*** R.P. Varma (1960); ***Murrayellopsis*** E. Post (1962)

Note: Krishnamurthy and Thomas (1971) proposed the merger of *Lynkiella* into *Veleroa*. Stewart (1989) provided justification for the merger of *Murrayellopsis* within *Veleroa*.

Vertebrata Gray 1821: 317, 338.

Note: Although Kylin (1956) had treated *Vertebrata* as distinct from *Polysiphonia*, much of the subsequent lit-

erature (e.g., Maggs and Hommersand 1993) regarded *Vertebrata* as congeneric with *Polysiphonia*. Using ribosomal DNA sequences, Choi et al. (2001) offered evidence to support maintaining these genera as distinct.

Vidalia J.V. Lamouroux ex J. Agardh 1863: 1117 *nom. cons.*

Synonyms: *Volubilaria* J.V. Lamouroux ex Bory de St.-Vincent (1830) *nom. rej.*; *Spirhymenia* Decaisne (1841) *nom. rej.*; *Epineuron* Harvey (1845) *nom. rej.*; *Euspiros* Targioni-Tozzetti ex Kuntze (1891) *nom. illeg.* (non Ruprecht 1849)

Note: In contrast to Norris' (1991a) taxonomic treatment placing *Vidalia* into synonymy with *Osmundaria*, Womersley (2003) presented a number of morphological differences to maintain these as distinct genera.

Waldoia W.R. Taylor 1962: 58.

Wilsonaea F. Schmitz 1893: 231.

Womersleyella Hollenberg 1967: 213.

Wrightiella F. Schmitz 1893: 221.

Order Gelidiales²⁶

Family Gelidiaceae

Acanthopeltis Okamura in Yatabe 1892: 157.

Synonym: *Yatabella* Okamura (1900)

Note: *Yatabella* was recognized by Kylin (1956) and Yoshida (1998), but Shimada et al. (1999) presented evidence based upon morphological similarities to propose the synonymy of the genus with *Acanthopeltis*.

Capreolia Guiry et Womersley 1993: 267.

Note: According to Nelson et al. (2006), the generic concept of *Capreolia*, based on life-history characteristics, needs to be modified to accommodate additional species possessing "Gelidium" life histories.

Gelidium J.V. Lamouroux 1813: 128. *nom. cons.*

Synonyms: *Cornea* Stackhouse (1809) *nom. rej.*; *Acropeltis* Montagne (1839); *Acrocarpus* Kützinger (1843); *Suhria* J. Agardh ex Endlicher (1843); ***Onikusa*** Akatsuka (1986b)

Note: Santelices and Montalva (1983) offered evidence for the merger of *Acropeltis* within *Gelidium*. Tronchin et al. (2002) presented molecular and morphological data to support the merger of the genera *Suhria* and *Onikusa* within *Gelidium*.

Porphyroglossum Kützinger 1847: 775.

²⁶ The taxonomic integrity of the Gelidiales was supported by Hommersand and Fredericq (1988), in contrast to Dixon's view (1961, 1982) to include them as a family within a broadly defined order Nemaliales. There have been many reports using sequence data for a variety of genes to better understand the phylogenetic relationships of the members of this order (Freshwater and Rueness 1994, Freshwater et al. 1995, Bailey and Freshwater 1997, Freshwater and Bailey 1998, Tronchin et al. 2002, Tronchin et al. 2003, Nelson et al. 2006). A new subdivision of the order into three families, with the amendment of both Gelidiellaceae and Gelidiaceae and the new family Pterocladaceae, was proposed by Perrone et al. (2007).

Ptilophora Kützinger 1847: 25.

Synonym: *Beckerella* Kylin 1956: 139

Note: Norris (1987a) presented evidence to merge *Beckerella* with *Ptilophora*, a proposal accepted by Yoshida (1998). Tronchin et al. (2003) provided both morphological and molecular data to support the congeneric status of *Beckerella* and *Ptilophora*.

Family Gelidiellaceae²⁷

Gelidiella Feldmann et G. Hamel 1934: 529.

Synonym: *Echinocaulon* Kützinger (1843) *nom. illeg.* [non (Meisner) Spach 1841]

Parviphycus Santelices 2004: 322.

Family Pterocladaceae²⁸

Apanta Tronchin et Freshwater 2007: 329.

Pterocladia J. Agardh 1852: 482.

Synonym: ***Pterocladiastrum*** Akatsuka (1986a)

Note: Nelson et al. (2006) found that *Pterocladiastrum*, based on the type species from the North Island of New Zealand, cannot be distinguished from *Pterocladia lucida* (Turner) J. Agardh.

Pterocladia Santelices et Hommersand 1997: 117.

Note: The segregation of this genus from *Pterocladia*, originally based on reproductive criteria, has been supported by gene-sequence data (Bailey and Freshwater 1997).

Order Acrosymphytales²⁹

Family Acrosymphytaceae³⁰

Acrosymphyton Sjöstedt 1926: 8.

Schimmelmannia Schousboe ex Kützinger 1849: 722.

Synonym: *Baylesia* Setchell (1912)

Note: Abbott (1961) offered evidence showing that *Baylesia* is congeneric with *Schimmelmannia*.

Order Gigartinales

Family Acrotylaceae

Acrotylus J. Agardh 1849: 86.

Amphiplexia J. Agardh 1892: 104.

Synonym: *Binderella* F. Schmitz in Engler and Prantl (1896)

²⁷ This family, established by Fan (1961), was emended by Perrone et al. (2006).

²⁸ Perrone et al. (2006) removed *Pterocladia* to its own new family, the Pterocladaceae, and they also proposed modifications of the concepts of the Gelidiaceae and Gelidiellaceae.

²⁹ Based upon SSU and LSU rDNA sequences, Withall and Saunders (2006) elevated the Acrosymphytaceae to ordinal status.

³⁰ Lindstrom (1987b) established this initially monogeneric family, placing it in the order Gigartinales *sensu lato*. Kylin (1956) placed *Acrosymphyton* in the Dumontiaceae (Cryptonemiales). Tai et al. (2001) provided support from molecular data for the distinct position of this family and that it did not belong to the Gigartinales. According to Saunders et al. (2004), *Schimmelmannia*, which Kylin (1956) placed in the Gloiosiphoniaceae, showed a close association with the Acrosymphytaceae both on molecular data and in sharing a terminal position of the auxiliary cell.

***Antrocentrum* Kraft et Min-Thein 1983: 177.**

***Clavicolonium* Kraft et Min-Thein 1983: 171.**

***Hennedya* Harvey 1855: 552.**

***Ranavalona* Kraft 1977a: 107.**

***Reinboldia* F. Schmitz in Engler and Prantl 1897: 351.**

Note: This monotypic genus is known only from the original collection (from near Durban, South Africa) of a single cystocarpic specimen that was lost in the bombing of the Berlin Herbarium during World War II. According to Kraft (1977), two fragments of the type exist, in BM and M, and the fragment in Munich (M) was designated by Kraft to serve as the lectotype.

Family Areschougiaceae³¹

Areschougia* Harvey 1855: 554. *nom. cons.

Synonyms: *Centrospora* Trevisan (1845) *nom. rej.*; *Neoareschougia* Kylin (1956)

Note: Silva et al. (1996) discussed the background nomenclatural history of Harvey's (1855) *Areschougia* (non Meneghini 1844, nec Trevisan 1845). Silva (1950) had proposed the Harvey generic name be conserved, and that proposal was accepted. In the meantime Kylin had proposed *Neoareschougia* as a substitute name for *Areschougia* Harvey in his posthumous 1956 publication.

***Austroclonium* Min-Thein et Womersley 1976: 131.**

Note: Chiovitti et al. (1998) transferred this genus to the Areschougiaceae from the Cystocloniaceae.

***Erythroclonium* Sonder 1853: 691.**

Synonym: *Axosiphon* Areschoug (1854)

***Rhabdonia* J.D. Hooker et Harvey 1847: 408.**

Family Blinksiaceae

***Blinksia* Hollenberg et I.A. Abbott 1968: 1247.**

Note: Saunders et al. (2004) suggested that this monotypic family might be included within the Cruoriaceae.

Family Calosiphoniaceae

***Calosiphonia* P. Crouan et H. Crouan 1852: no. 181.**

Synonym: *Lygistes* J. Agardh (1876)

³¹ Some of the genera presently considered members of this family were included by Kylin (1956) in the Rhabdoniaceae, a junior synonym of the Areschougiaceae. On the basis of reproductive morphology, Gabrielson and Hommersand (1982) merged the members of the uniaxial Rhabdoniaceae (as the new tribe Areschougieae) with those already in the multiaxial Solieriaceae. This approach was followed by Womersley (1994), but he used the precedent Areschougiaceae rather than the more recent familial name, the Solieriaceae. Chiovitti et al. (1998) re-established the Areschougiaceae for several genera, including *Areschougia*, as distinct from others of the reinstated Solieriaceae, based on carrageenan chemistry. Fredericq et al. (1999) found weak support for such a separation using *rbcL* sequences. Using SSU rDNA sequences, Saunders et al. (2004) found support to retain both the Areschougiaceae and the Solieriaceae.

***Schmitzia* P.C. Silva 1959: 63.**

Synonyms: *Bertholdia* F. Schmitz in Engler and Prantl (1897) *nom. illeg.* (non Lagerheim 1889); *Helminthiopsis* J. Agardh (1899) *nom. illeg.* (non *Helminthopsis* Heer 1877)

Family Catenellopsidaceae

***Catenellopsis* V.J. Chapman 1979: 285.**

Family Caulacanthaceae

Catenella* Greville 1830: lxiii *nom. cons.

Synonym: *Clavatula* Stackhouse (1809) *nom. rej.*

***Catenellocolax* Weber-van Bosse 1928: 401.**

Note: This poorly known parasite of *Catenella* is known only in the vegetative state.

***Caulacanthus* Kützing 1843: 395.**

Synonym: *Olivia* Montagne in Durieu de Maisonneuve (1846) *nom. illeg.* (non Bertoloni 1810)

***Feldmannophycus* H. Augier et Boudouresque 1971: 29.**

***Heringia* J. Agardh 1842: 55, 67, 68.**

***Montemaria* A.B. Joly et Alveal 1970: 88.**

***Sterrocladia* F. Schmitz 1893: 77.**

Note: Skuja (1944) suggested that *Sterrocladia* was possibly a member of the Caulacanthaceae (=Rhabdoniaceae) based on anatomical features. Sexual characteristics and tetrasporangia are still unknown.

***Taylorophycus* E.Y. Dawson 1961: 222.**

Family Corynocystaceae

***Corynocystis* Kraft in Kraft et al. 1999: 26.**

Note: This monotypic genus was initially assigned to the order Gigartinales. Kraft (in Saunders et al. 2004) later established its own family to accommodate this genus.

Family Crossocarpaceae³²

***Beringia* Perestenko 1975: 1683.**

***Cirrulicarpus* Tokida et Masaki 1956: 70.**

***Crossocarpus* Ruprecht in Middendorff 1850: 264.**

Note: Kylin (1956) treated this genus in the synonymy of *Callophyllis*. Perestenko (1975) provided justification for its reinstatement.

***Hommersandia* G.I. Hansen et S.C. Lindstrom 1984: 476.**

***Ionia* Perestenko 1994: 105, 202.**

***Kallymeniopsis* Perestenko 1977a: 398.**

Note: Perestenko's (1975) original attempt to describe *Kallymeniopsis* was invalid because she failed to desig-

³² Perestenko (1975) established the family, assigning to it the genera *Cirrulicarpus*, *Crossocarpus*, *Erythrophyllum*, and her new genus *Kallymeniopsis*.

nate the type of the genus. She later validated the genus by her designation of *Kallymeniopsis lacera* (Postels et Ruprecht) Perestenko as generitype (Perestenko 1977a).

***Velatocarpus* Perestenko 1986: 90.**

Family Cruoriaceae

***Cruoria* Fries 1835: 317.**

Synonyms: *Chaetoderma* Kützing (1843); *Erythroclathrus* Liebmann (1838)

Note: In a study of North Atlantic species assigned to this genus, Maggs and Guiry (1989) showed that *Cruoria pellita* (Lyngbye) Fries (the type of the genus) and *C. cruoriaeformis* (P. Crouan et H. Crouan) Denizot have isomorphic gametophytic and tetrasporophytic phases. The gametophytes are monoecious and produce carposporophytes, whereas the tetrasporophytes produce laterally borne, zonately divided sporangia. Other apparent species (*C. rosea* and *C. arctica*), however, have very different morphologies as well as refractive cells and represent tetrasporophytes of algae with heteromorphic life histories, and thus do not belong to this genus nor to the family.

Family Cubiculosporaceae

***Cubiculosporum* Kraft 1973: 880.**

Family Cystocloniaceae³³

***Acanthococcus* J.D. Hooker et Harvey 1845: 261.**

Calliblepharis* Kützing 1843: 403. *nom. cons.

Synonyms: *Ciliaria* Stackhouse (1809) *nom. rej.*; *Sarcophylla* Stackhouse (1816)

***Craspedocarpus* F. Schmitz in Engler and Prantl 1897: 375.**

Note: Schneider (1988) emended the description of *Craspedocarpus* and *Calliblepharis* based on reproductive morphology.

***Cystoclonium* Kützing 1843: 404.**

Synonym: *Tubercularia* Stackhouse (1816) *nom. rej.* (non Tode 1790, *nom. cons.*)

***Erythronaema* J. Agardh 1892: 97.**

***Fimbrifolium* G.I. Hansen 1980: 208.**

***Gloiophyllis* J. Agardh 1890: 27.**

Synonym: *Grunowiella* F. Schmitz in Engler and Prantl (1897) *nom. illeg.* (non *Grunowiella* Van Heurck 1896)

***Hypnea* J.V. Lamouroux 1813: 131.**

Synonyms: *Hypnophycus* Kützing (1843); *Merrifieldia* J. Agardh (1885)

***Hypneocolax* Børgesen 1920: 479.**

Rhodophyllis* Kützing 1847: 23. *nom. cons.

Synonyms: *Bifida* Stackhouse (1809) *nom. rej.*; *Inochorion* Kützing (1843); *Leptophyllum* Nägeli (1847)

***Stictosporum* (J. Agardh) Harvey ex J. Agardh 1890: 25.**

Family Dicranemataceae

***Dicranema* Sonder 1845: 56.**

***Peltasta* J. Agardh 1892: 102.**

***Pinnatiphycus* N'Yeurt, Payri et Gabrielson in N'Yeurt et al. 2006: 423.**

***Reptataxis* Kraft 1977b: 239.**

***Tenaciphyllum* Børgesen 1953: 28.**

Note: Kylin (1956) accepted Børgesen's placement of this genus in the Solieriaceae. Kraft (1977b) pointed out that there is no apparent difference between *Tenaciphyllum* and *Tylotus* in vegetative and tetrasporangiate features, but that cystocarpic specimens are needed for final disposition of this taxon.

***Tylotus* J. Agardh 1876: 428.**

Note: Kylin (1956) placed this genus in the Gracilariaceae. Kraft (1977b) moved it to the Dicranemataceae.

Family Dumontiaceae

***Constantinea* Postels et Ruprecht 1840: 17.**

***Cryptosiphonia* J. Agardh 1876: 251.**

***Dasyphloea* Montagne 1842: 8.**

Synonym: *Nizzophlaea* J. Agardh (1876)

***Dilsea* Stackhouse 1809: 55, 71.**

Synonym: *Sarcophyllis* J. Agardh (1876)

Dudresnaya* P. Crouan et H. Crouan 1835: 98. *nom. cons.

Synonym: *Borrichus* S.F. Gray (1821)

***Dumontia* J.V. Lamouroux 1813: 133.**

Note: According to Abbott (1979), the correct name for the type species of this genus is *Dumontia contorta* (S.G. Gmelin) Ruprecht. Taxonomic synonyms include *D. incrassata* (O.F. Müller) J.V. Lamouroux and *D. filiformis* (Lyngbye) J. Agardh.

***Farlowia* J. Agardh 1876: 261.**

***Gibsmithia* Doty 1963: 458.**

***Hyalosiphonia* Okamura 1909: 50.**

***Kraftia* Shepley et Womersley 1983: 209.**

***Leptocladia* J. Agardh 1892: 95.**

Synonym: *Andersoniella* F. Schmitz in Engler and Prantl (1897)

³³ On the basis of their analysis of small-subunit rDNA sequences, Saunders et al. (2004) proposed the merger of the Hypneaceae, containing *Hypnea* and *Hypneocolax*, within the Cystocloniaceae.

Masudaphycus S.C. Lindstrom 1988: 97.

Orculifilum S.C. Lindstrom 1987a: 129.

Neodilsea Tokida 1943: 96.

Pikea Harvey 1853: 246.

Rhodopeltis Harvey 1863: t. 264.

Synonym: *Litharthron* Weber-van Bosse (1904)

Note: Some species that had been placed in this genus were subsequently removed and became the bases of new genera (*Akalaphycus* and *Stenopeltis*) assigned to the Liagoraceae (Nemaliales).

Thuretellopsis Kylin 1925: 13.

Waernia R.T. Wilce, Maggs et Sears 2003: 200.

Weeksia Setchell 1901: 128.

Family Endocladiaceae

Endocladia J. Agardh 1842: 449.

Synonym: *Acanthobolus* Kützing (1843)

Gloiopeltis J. Agardh 1842: 68.

Synonym: *Endotrichia* Suringar (1870)

Family Furcellariaceae

Furcellaria J.V. Lamouroux 1813: 45. *nom. cons.*

Synonym: *Fastigiaria* Stackhouse (1809) *nom. rej.*

Halarachnion Kützing 1843: 394.

Neurocaulon Zanardini ex Kützing 1849: 744. *nom. cons.*

Opuntiella Kylin 1925: 23.

Note: See Fredericq et al. (1999).

Turnerella F. Schmitz in Engler and Prantl 1896: 371.

Note: See Fredericq et al. (1999).

Family Gainiaceae³⁴

Gainia R.L. Moe 1985: 420.

Family Gigartinaeae

Chondracanthus Kützing 1843: 399.

Synonym: *Chondroclonium* Kützing (1845) *nom. illeg.*

Note: This genus, which had been treated by Kylin (1956) as congeneric with *Gigartina*, was reinstated by Hommersand et al. (1993) on both developmental and morphological evidence. Additional evidence from gene sequence data, showing that this genus formed a distinct clade in the family, was provided by Hommersand et al. (1994).

Chondrus Stackhouse 1797: xv, xxiv.

Synonym: *Polymorpha* Stackhouse (1809)

Note: A detailed report on the vegetative and reproduc-

tive development in the type species, *Chondrus crispus* Stackhouse, was presented by Fredericq et al. (1992).

Gigartina Stackhouse 1809: 74.

Synonym: *Chondrodictyon* Kützing (1843)

Note: This genus has been more narrowly circumscribed after the reinstatements of the genera *Mastocarpus*, *Chondracanthus*, and *Sarcothalia* (q. v.). An account of the vegetative and reproductive development in the type species, *Gigartina pistillata* (S.G. Gmelin) Stackhouse, was presented by Hommersand et al. (1992). In a study using nucleotide sequence comparisons in type specimens, Hughey et al. (2002) were able to clarify the generic position of a number of species.

Iridaea Bory de St.-Vincent 1826: 15. [*Iridea*] *nom. et orth. cons.*

Note: Research by Hommersand et al. (1993, 1994) has re-defined this genus, with some species formerly assigned to it now transferred to the resurrected genus *Mazzaella*. Hughey et al. (2001) were able to show that the provenance of the type of the genus, *Iridaea cordata* (Turner) Bory, is southern South America. Parkinson (1981) discussed nomenclatural problems with regard to *Iridaea*, *Gigartina*, and *Rhodoglossum*.

Mazzaella G. De Toni 1936: [4].

Synonyms: *Collinsia* J. Agardh (1899) *nom. illeg.* (non Nuttall 1817); *Iridophycus* Setchell et N.L. Gardner (1936)
Note: This genus, which had been treated by Kylin (1956) as congeneric with *Iridaea*, was reinstated by Hommersand et al. (1993). Further evidence for this taxonomic treatment was offered by Hommersand et al. (1994). According to Hommersand et al. (1999), *Mazzaella* is paraphyletic to *Chondrus* in terms of morphological and molecular analyses, the two genera being distinguished by a single diagnostic trait.

Ostiophyllum Kraft 2003: 19.

Rhodoglossum J. Agardh 1876: 183.

Note: Following the re-definition of the genera of this family by Hommersand et al. (1993, 1994), some species formerly placed in *Rhodoglossum* have been moved to the resurrected genus *Mazzaella*.

Sarcothalia Kützing 1849: 739.

Note: Kylin (1956) placed this genus in synonymy with *Gigartina*. Hommersand et al. (1993) offered reasons based on both morphological and developmental observations to justify the reinstatement of this genus. Data from gene-sequence analyses provided additional justification.

Family Gloiosiphoniaceae

Cruoriopsis L. Dufour 1864: 59.

Gloeophycus I.K. Lee et S.A. Yoo 1979: 347.

Gloiosiphonia Carmichael in Berkeley 1833: 45.

Synonym: *Capillaria* Stackhouse (1809) *nom. illeg.* (non Roussel 1806)

Peleophycus I.A. Abbott 1985b: 325.

³⁴ This family was established by Moe (1985).

Plagiospora Kuckuck 1897: 393.

Note: According to Maggs (1990) this genus is of uncertain affinities. Kylin (1956) treated it as congeneric with *Cruoriopsis* in the Cruoriaceae. Irvine (1983) provisionally placed it with the Gloiosiphoniaceae because of its resemblance to crustose tetrasporophytes of species of *Gloiosiphonia*. Maggs (1990) stated that a new family in the Gigartinales might be justified for it, but left it tentatively within the Gloiosiphoniaceae.

Rhododiscus P. Crouan et H. Crouan 1859: 289.

Thuretella F. Schmitz in Engler and Prantl 1897: 506.

Family Haemeschariaceae³⁵

Haemescharia Kjellman 1883: 142.

Note: Although this genus was treated by Kylin (1956) as congeneric with *Petrocelis* [= *Mastocarpus*], Wilce and Maggs (1989) offered evidence for the reinstatement of the genus.

Family Kallymeniaceae

Austrophyllis Womersley et R.E. Norris 1971: 27.

Callocolax F. Schmitz ex Batters 1895: 9.

Callophyllis Kützting 1843: 400.

Synonyms: *Chondrococcus* Kützting (1847); *Rhodocladia* Sonder (1853); *Microcoelia* J. Agardh (1876) *nom. illeg.* (non Lindley 1830)

Note: See Note under *Portieria* for the reasons for the placement of *Chondrococcus* as a synonym of *Callophyllis*.

Ectophora J. Agardh 1876: 689.

Euthora J. Agardh 1847: 11.

Note: Wynne and Heine (1992) supported maintaining *Euthora* as distinct from *Callophyllis*, contrary to the proposal by Hooper and South (1974). Using molecular data in their phylogenetic analysis, Harper and Saunders (2002b) also recognized *Euthora* as distinct from *Callophyllis*. Kylin (1956) treated them as distinct genera.

Erythrophyllum J. Agardh 1872: 10.

Glaphyrymenia J. Agardh 1885: 52.

Hormophora J. Agardh 1892: 77.

Kallymenia J. Agardh 1842: 98.

Synonyms: *Euhymenia* Kützting (1843); *Dactylymenia* J. Agardh (1899)

Meredithia J. Agardh 1892: 73.

Note: Although some workers (e.g., Hommersand and Ott 1970, Codomier 1973, Irvine 1983) followed Kylin's (1956) treatment of *Meredithia* as congeneric with *Kally-*

menia, Guiry and Maggs (1984) offered characteristics to distinguish these two genera from one another.

Nereoginkgo Kylin in Kylin and Skottsberg 1919: 15.

Polycoelia J. Agardh 1849: 87.

Pugetia Kylin 1925: 30.

Rhizopogonia Kylin 1934: 6.

Thamnophyllis R.E. Norris 1964: 104.

Family Mychodeaceae

Mychodea J.D. Hooker et Harvey 1847: 407.

Synonyms: *Neurophyllis* Zanardini (1874) [*'Nevrophyllis'*]; *Ectoclinium* J. Agardh (1876); *Lecithites* J. Agardh (1852)

Family Mychodeophyllaceae³⁶

Mychodeophyllum Kraft 1978: 578.

Family Nizymeniaceae³⁷

Nizymenia Sonder 1855: 520.

Synonyms: *Stenocladia* J. Agardh (1872); *Amylophora* J. Agardh (1892)

Note: Although *Stenocladia* was recognized by both Kylin (1956) and Searles (1968), Chiovitti et al. (1995), using evidence from polysaccharide wall chemistry, vegetative anatomy, and nucleotide sequence data, concluded that there were insufficient grounds to separate any of the three species (one of *Nizymenia* and two of *Stenocladia*) from one another at the generic level.

Family Peyssonneliaceae

Chevaliericrusta Denizot 1968: 212, 307.

Metapeyssonnelia Boudouresque, Coppejans et Marcot 1976: 288.

Peyssonnelia Decaisne 1841: 196, 197 [*'Peyssonellia'*]

Synonyms: *Nardoa* Zanardini (1844); *Gymnosorus* Trevisan (1848); *Cruoriella* P. Crouan et H. Crouan (1859); *Lithymenia* Zanardini in Lorenz (1863); *Squamaria* Zanardini (1841) *nom. illeg.* (non Ludwig 1757); *Haematostagon* Strömfelt (1886); **Sonderophycus** Denizot (1968)

Note: Although Denizot (1968) recognized *Cruoriella* as distinct from *Peyssonnelia*, most other authors have treated them as synonyms (Yoneshigue 1985, Maggs 1990, Womersley 1994, Guimarães and Fujii 1999). According to Womersley and Sinkora (1981), *Peyssonnelia australis* Sonder, the basis of Denizot's (1968) *Sonderophycus*, is a genuine *Peyssonnelia* and not the material "in hand" for the description of *Sonderophycus*. The new genus and species *Sonderopelta coriacea* Womersley et Sinkora was described for the material that was generically distinct from the *Peyssonnelia*.

Polystrata Heydrich 1905: 35.

Synonym: *Ethelia* Weber-van Bosse (1921)

³⁵ Wilce and Maggs (1989) recognized the new family Haemeschariaceae on the basis of several characteristics, including the unique feature of intercalary chains of obliquely cruciate tetrasporangia.

³⁶ This family was newly described by Kraft (1978).

³⁷ Womersley (1971) separated this family from the Phacelocarpaceae, originally assigning to it the genera *Nizymenia* and *Stenocladia*.

Note: Kato et al. (2006) reported for the first time male and female reproductive structures for the genus. They also reported SSU rDNA sequence data for two species of this genus and also for some other species in the family Peyssonneliaceae. The fact that *Ethelia fosliei* Weber-van Bosse, the designated type of the genus, was transferred to *Polysrta* by Denizot (1968) renders *Ethelia* congeneric with *Polysrta*. Weber-van Bosse (1921) placed two other species in *Ethelia*. The status of *E. biradiata* (Weber-van Bosse) Weber-van Bosse is uncertain. According to Womersley (1994), Weber-van Bosse's concept of *E. australis* is conspecific with *Sonderopelta coriacea*, whereas the type of *Peyssonnelia australis* Sonder belongs to *Peyssonnelia capensis* Montagne.

***Pulvinia* Hollenberg 1970: 63.**

***Ramicrosta* D.R. Zhang et J.H. Zhou 1981: 538, 543.**

***Riquetophycus* Denizot 1968: 258, 307.**

***Sonderopelta* Womersley et Sinkora 1981: 85.**

Note: See Note under *Peyssonnelia*.

Family Phacelocarpaceae³⁸

Phacelocarpus* Endlicher et Diesing 1845: 289. *nom. cons.

Synonyms: *Ctenodus* Kützing (1843) *nom. rej.*; *Euctenodus* Kützing (1847); *Seiropora* Harvey ex Ruprecht (1851) *nom. illeg.* (non Harvey 1846)

Family Phylloporaceae³⁹

***Ahnfeltiopsis* P.C. Silva et DeCew 1992: 10.**

Note: Silva and DeCew (1992) delineated this new genus to accommodate some species that had been previously assigned to the genera *Ahnfeltia* and *Gymnogongrus* in which internal cystocarps were formed and which had life histories in which an erect gametophytic stage alternated with a crustose tetrasporophytic stage. Fredericq et al. (2003), however, observed that their phylogenetic analyses, using three sets of DNA sequences, demonstrated a lack of correlation between life history traits and the traditional criteria for classification.

***Besa* Setchell 1912: 236.**

Note: Conducting a morphological and molecular analysis using topotype material, Fredericq and Lopez-Bautista (2002) were able to confirm the position of this enigmatic genus within the Phylloporaceae.

***Ceratocolax* Rosenvinge 1898: 34.**

***Coccotylus* Kützing 1843: 412.**

Note: Following arguments by Dixon and Irvine (1977) and Guiry and Garbary (1990) that *Phyllophora truncata* (Pallas) Zinova is distinct from *Phyllophora sensu stricto*, Wynne and Heine (1992) reinstated the genus.

***Erythrodermis* Batters 1900: 378.**

***Gymnogongrus* Martius 1833: 27.**

Synonyms: *Tylocarpus* Kützing (1843), *Oncotylus* Kützing (1843); *Pachycarpus* Kützing (1843) *nom. illeg.* (non E. Meyer 1838)

Note: In a study using sequence data from three different genes, Fredericq et al. (2003) found that there was a lack of correlation between their phylogenetic results and the traditional life-history criteria used for classification.

***Lukinia* Perestenko 1994: 129, 203.**

***Mastocarpus* Kützing 1843: 398.**

Synonym: *Petrocelis* J. Agardh (1851)

Note: Guiry et al. (1984) summarized the abundant evidence, including life history studies by West (1972), Polanshek and West (1975, 1977), West et al. (1977, 1978, 1981), Masuda and Kurogi (1981), and Guiry and West (1983), for the reinstatement of *Mastocarpus* as a genus distinct from *Gigartina* Stackhouse. In many species of *Mastocarpus*, a crustose tetrasporangiate phase identifiable as the genus *Petrocelis* was produced in culturing studies. Or, tetraspores from "*Petrocelis*" material collected from nature gave rise to *Mastocarpus* gametophytes in culturing studies (West et al. 1977). Earlier, Kim (1976) presented arguments for the removal of sub-genus *Mastocarpus* from *Gigartina* and its removal to its own family. Fredericq and Ramírez (1996) showed that *Mastocarpus* formed a strongly supported clade within the Phylloporaceae on the basis of *rbcL* gene sequence analysis. Saunders et al. (2004) confirmed that assignment.

***Ozophora* J. Agardh 1892: 78.**

Note: Although Kylin (1956) treated this genus as congeneric with *Phyllophora*, Abbott (1969) reinstated the genus as distinct on the basis of its spermatangial sori being produced on special leaflets and producing its cystocarps in papillae. But also see Guiry and Garbary (1990) for their comments.

***Petroglossum* Hollenberg 1943: 571.**

Note: Kylin (1956) treated this genus as congeneric with *Phyllophora*. The genus was reinstated by Hollenberg and Abbott (1966) on the basis of its spermatangial sori being produced in elevated surface patches rather than in pits or cavities as in *Phyllophora*. Guiry and Garbary (1990) called for a reinvestigation of this genus along with *Ozophora* and *Phyllophora*.

Phyllophora* Greville 1830: lvi. *nom. cons.

Synonyms: *Epiphylla* Stackhouse (1816) *nom. rej.*; *Acanthotylus* Kützing (1843); *Phyllotylus* Kützing (1843); *Cypellon* Targioni-Tozzetti ex Ruprecht (1851); *Phyllogenes* Targioni-Tozzetti ex Ruprecht (1851); *Colacolepis* F. Schmitz (1893)

³⁸ *Phacelocarpus* has been assigned to the Sphaerococcaceae by Kylin (1956). Searles (1968) established the Phacelocarpaceae, originally containing *Phacelocarpus*, *Nizymenia* and *Stenocladia*.

³⁹ When justification was offered by Guiry et al. (1984) for the reinstatement of *Mastocarpus* (including *Petrocelis*) as distinct from *Gigartina*, the family Petrocelidaceae (Denizot 1968) was used for the assignment of *Mastocarpus*. But later work by Fredericq and Ramírez (1996) demonstrated that *Mastocarpus* is strongly related to the Phylloporaceae.

***Reingardia* Perestenko 1994: 129, 203.**

***Schottera* Guiry et Hollenberg 1975: 152.**

Stenogramma Harvey in W.J. Hooker and Arnott 1840: 408.

Synonym: *Microgongrus* J. Agardh (1901)

Family Polyideaceae⁴⁰

Polyides C. Agardh 1822: 390.

Synonym: *Spongiocarpus* Greville (1824)

Family Rhizophyllidaceae⁴¹

Contarinia Zanardini 1843: 45.

Synonym: *Rhizophyllis* Kützing (1845)

Note: Kylin (1956) recognized *Rhizophyllis*, but Denizot (1968) later showed that the correct name for this genus is *Contarinia*.

***Nesophila* W.A. Nelson et N.M. Adams 1993: 3.**

Ochtodes J. Agardh 1872: 5.

Portieria Zanardini 1851: 33.

Note: The complicated nomenclatural history of this genus was discussed by Silva (in Silva et al. 1987). This genus appeared as *Desmia* Lyngbye (1819) in Kylin (1956), with *Chondrococcus* Kützing (1847) and *Portieria* Zanardini (1851) listed as synonyms. But as Silva pointed out, *Desmia* is a superfluous (and thus illegitimate) name for the phaeophycean genus *Desmarestia* J.V. Lamouroux (1813). *Chondrococcus* was established by Kützing on the basis of two species, the first referable to *Melanthalia* Montagne (1843) and the second referable to *Callophyllis* Kützing (1843). According to Art. 10.1 of the ICBN (McNeill et al. 2006a), a generic name is typified by the cited species rather than by "the material in hand". Schmitz (1889) appears to have been the first to have lectotypified *Chondrococcus* with *C. lambertii* (Turner) Kützing, and therefore *Chondrococcus* is treated here as congeneric with *Callophyllis* Kützing (1843).

Family Rissoellaceae

Rissoella J. Agardh 1849: 85.

Family Schmitziellaceae⁴²

Schmitziella Bornet et Batters in Batters 1892: 186.

Note: This genus was assigned to the Corallinaceae by Kylin (1956). A subfamily was later recognized for it (Johansen 1969, 1981, Cabiocch 1972). After an exami-

nation of type material and other collections of the type species, *Schmitziella endophloea* Bornet et Batters, Woelkerling and Irvine (1982) re-assigned *Schmitziella* to the Acrochaetiaceae, as a genus 'incertae sedis'. Pueschel (1989) indicated that this genus probably belongs to the Gigartinales.

Family Solieriaceae⁴³

Agardhiella F. Schmitz in Engler and Prantl 1896: 371.

Synonym: ***Neoagardhiella*** M.J. Wynne et W.R. Taylor (1973)

Note: Gabrielson and Hommersand (1982) recognized that the six specimens associated with the protologue of *Gigartina tenera* J. Agardh were heterogeneous, four belonging to *Agardhiella subulata* (C. Agardh) Kraft et M.J. Wynne, and two belonging to the genus *Solieria*. Taylor (in Taylor and Rhyne 1970) had selected one of the *Solieria* specimens to serve as lectotype. But because Taylor's choice did not agree with the original description, Gabrielson (1985) presented arguments to re-lectotypify *G. tenera* with a specimen generically different from Taylor's choice. Gabrielson's new lectotype meant that *Gigartina tenera* was tied to the genus *Agardhiella* rather than to the genus *Solieria*.

Anatheca F. Schmitz in Engler and Prantl 1896: 374.

***Betaphycus* Doty in Silva et al. 1996: 919.**

Eucheuma J. Agardh 1847: 16.

Euryomma F. Schmitz in Engler and Prantl 1896: 374.

Flahaultia Bornet 1892: 278.

Gardneriella Kylin 1941: 18.

***Kappaphycus* Doty 1988: 171.**

***Melanema* Min-Thein et Womersley 1976: 68.**

Meristotheca J. Agardh 1872: 36.

Synonym: ***Meristiella*** D.P. Cheney in Gabrielson and Cheney (1987)

Note: Faye et al. (2004) offered evidence for the merger of the genus *Meristiella* into *Meristotheca*.

***Notophycus* Moe 1986b: 544.**

***Placentophora* Kraft 1976: 400.**

Reticulobotrys E.Y. Dawson 1949: 11.

Sarcodiotheca Kylin 1932: 15.

Note: When established by Kylin, this genus contained only species with flattened, dichotomously branched thalli. Gabrielson (1982a,b) broadened the circumscription of the genus to include both flattened and terete

⁴⁰ This family, which was newly described by Kylin (1956) and placed in the Cryptonemiales, was later transferred to the Gigartinales by Papenfuss (1966).

⁴¹ When Denizot (1968) proposed *Contarinia* as the name with priority over *Rhizophyllis*, he also created the new family name Contariniaceae. But Wiseman (1975) stated that such a name is superfluous and that Rhizophyllidaceae should be retained to accommodate these genera. Kylin (1956) assigned this family to the Cryptonemiales, but according to Wiseman (1975) it belongs in the Gigartinales.

⁴² According to Saunders et al. (2004), Garbary and Saunders plan to recommend the elevation of subfamily Schmitzielloideae (Svedelius) Johansen (Johansen 1969) to familial rank.

⁴³ On the basis of their analysis of small-subunit rDNA sequences of *Wurdemannia miniata*, Saunders et al. (2004) proposed the merger of the monotypic family Wurdemanniaceae into the Solieriaceae.

species. These species share the feature that the gonimoblasts combine with vegetative cells to produce a central placenta made up of compactly organized cells.

Sarconema Zanardini 1858: 264.

Solieria J. Agardh 1842: 156.

Tikvahiella Kraft et Gabrielson 1983: 47.

Wurdemannia Harvey 1853: 245.

Synonym: *Pseudogelidium* Schiffner (1933)

Family Sphaerococcaceae⁴⁴

Sphaerococcus Stackhouse 1797: xxiv.

Synonyms: *Coronopifolia* Stackhouse (1809); *Rhyncho-coccus* Kützinger (1843)

Family Tichocarpaceae

Tichocarpus Ruprecht in Middendorff 1851: 320.

Incertae sedis

Callophycus Trevisan 1848: 107.

Synonyms: *Mammea* J. Agardh (1841) *nom. illeg.* (non Linnaeus 1753); *Lenormandia* Montagne (1844) *nom. illeg.* (non Sonder 1845, *nom. cons.*; nec Delise in Desmazières 1841, *nom. rej.*); *Thysanocladia* (Endlicher) Lindley (1846) *nom. illeg.*

Note: In their study using *rbcL* sequences to produce a phylogenetic analysis of some related genera of Gigartinales, Faye et al. (2005) found that the multiaxial *Callophycus* fell outside the Solieriaceae *sensu stricto*. It displayed a number of morphological and chemical properties that separated it from the other members of this family, and so the authors treated its familial position as uncertain. Silva (1957b) pointed out that the name *Thysanocladia* is illegitimate because it included *Delisea* as a synonym. But it is not a taxonomic synonym of *Delisea* because its type species *Rhodomela dorsifera* C. Agardh is a member of the Solieriaceae and so recognized in that family by Kylin (1956). But as explained above, it is here placed in the category "Incertae sedis".

Order Gracilariales⁴⁵

Family Gracilariaceae

Congracilaria H. Yamamoto 1986: 287.

Curdiea Harvey 1855: 333.

Synonym: *Sarcocladia* Harvey (1855)

Note: The relationship of *Curdiea* to other genera in this family has been discussed by Fredericq and Hommersand (1989c, 1990b) and Nelson et al. (1999).

Gracilaria Greville 1830: liv. *nom. cons.*

Synonyms: *Ceramion* Adanson (1763) *nom. rej.*; *Ceramianthemum* Donati ex Léman in Cuvier (1817); *Plocaria*

Nees (1820) *nom. rej.*; *Corallopsis* Greville (1830); *Tyleiophora* J. Agardh (1890)

Note: Steentoft et al. (1991) explained why it was necessary to propose this generic name for conservation and for their choice of a new lectotype of the genus, namely, *G. bursa-pastoris* (S.G. Gmelin) P.C. Silva. Steentoft et al. (1995) provided information for distinguishing similar-appearing terete species of *Gracilaria* and *Gracilariopsis* in Europe. Liao and Hommersand (2003) reported on their study of the reproductive morphology of the type species of each of the genera treated as synonyms of *Gracilaria*.

Gracilariophila Setchell et H.L. Wilson in Wilson 1910: 26.

Gracilariopsis E.Y. Dawson 1949: 40.

Note: Studies by Papenfuss (1966) of British material of what he regarded as *Gracilaria verrucosa* (Hudson) Papenfuss led him to question Dawson's basis for the recognition of *Gracilariopsis*, namely, the absence of nutritive filaments connecting the carposporophyte to the pericarp. Most subsequent authors were quick to follow Papenfuss in not recognizing *Gracilariopsis*. Fredericq and Hommersand (1989b) were able to demonstrate that *Gracilariopsis* can be distinguished from *Gracilaria* both on difference in spermatangial development and on the lack of nutritive filaments between the carposporophyte and the cells of the pericarp, as Dawson had first proposed. They also indicated the occurrence of *Gracilariopsis* in Europe, which is the implied explanation for Papenfuss' observation of both conditions of the cystocarps (presence and absence of the nutritive filaments in his material).

Hydropuntia Montagne 1842: 7.

Synonym: **Polycavernosa** C.F. Chang et B.M. Xia (1963)

Note: After the establishment of the segregate genus *Polycavernosa* from *Gracilaria* by Chang and Xia (1963), Wynne (1989) proposed the resurrection of the genus *Hydropuntia*, which had been treated as congeneric with *Gracilaria*.

Melanthalia Montagne 1843: 296.

Family Pterocladophilaceae⁴⁶

Gelidiocolax N.L. Gardner 1927: 340.

Holmsella Sturch 1926: 606.

Note: Fredericq and Hommersand (1990a) offered evidence that *Holmsella*, a genus parasitic on *Gracilaria* and *Gracilariopsis*, was incorrectly placed in the Choreococaceae and moved it to the Pterocladophilaceae. The genus had been known only from its northern hemisphere type species, *H. pachyderma* (Reinsch) Sturch, until Noble and Kraft (1984) added a second species, *H. australis*, from the southern hemisphere.

Pterocladophila K.C. Fan et Papenfuss 1959: 34.

⁴⁴ Although Kylin (1956) had assigned five genera to the Sphaerococcaceae, it is a monogeneric family in the present treatment following the transfer of four of these genera to other families.

⁴⁵ Fredericq and Hommersand (1989a) presented evidence for the recognition of this new order.

⁴⁶ This family was established by Fan and Papenfuss (1959) and was originally but tentatively assigned to the order Cryptonemiales.

Order Halymeniales⁴⁷**Family Halymeniaceae*****Acrodiscus*** Zanardini 1868: 201.***Aeodes*** J. Agardh 1876: 678.***Blastophye*** J. Agardh 1892: 70.***Carpopeltis*** F. Schmitz 1895: 168.***Chondriella*** Levring in Skottsberg 1941: 640.

Note: On the basis of Fredericq et al. (1993), we assign this genus to the Halymeniaceae. Formerly, the genus was recognized to be in the monotypic family Chondriellaceae placed in the Gigartinales.

Codiophyllum J.E. Gray 1872: 140.***Corynomorpha*** J. Agardh 1872: 3. *nom. cons.*

Synonym: *Prismatoma* (J. Agardh) Harvey (1860) *nom. rej.*

Cryptonemia J. Agardh 1842: 100.

Synonym: *Dactylymenia* J. Agardh (1899)

Note: Womersley and Lewis (1984) presented justification for treating *Dactylymenia* within the synonymy of *Cryptonemia*.

Epiphloea J. Agardh 1890: 18.***Gelinaria*** Sonder 1845: 55.***Grateloupia*** C. Agardh 1822: 221. *nom. cons.*

Synonyms: *Cyrtymenia* F. Schmitz (1896); *Exartesia* Chevallier (1836); *Dermocorynus* P. Crouan et H. Crouan (1858); ***Pachymeniopsis*** Yamada ex Kawabata (1954); *Phyllymenia* J. Agardh (1848); *Prionitis* J. Agardh (1851); ***Sinotubimorpha*** W.X. Li et Z.L. Ding (1998); *Zanardinula* G. De Toni (1936)

Note: Using *rbcL* sequence data, Wilkes et al. (2005) offered evidence for treating *Dermocorynus* as congeneric with *Grateloupia*. On the basis of both morphological and molecular data, Wang et al. (2001) proposed the merger of *Prionitis* within *Grateloupia*. See Wynne's (2005a) Note 248 for a discussion of the genus *Sinotubimorpha*, which was based on the species *Grateloupia porracea* Kützinger with a type locality in the West Indies. De Clerck et al. (2005b) reduced *Phyllymenia* to synonymy within *Grateloupia*. Parkinson (1980b) discussed the typification and related nomenclatural problems of some species placed in *Grateloupia*. *Pachymeniopsis* Yamada ex Kawabata (1954) was not included in Kylin (1956). Although this genus had been accepted by some work-

ers (e.g., Lee and Lee 1993), its proposed merger into *Grateloupia* by Kawaguchi (1997) is now accepted (Yoshida 1998).

Grateloupiocolax* Schnetter et Bula-Meyer in Schnetter et al. 1983: 80.**Halymenia*** C. Agardh 1817: xix. *nom. cons.*

Synonyms: *Isymenia* J. Agardh (1899); *Hymenophloea* J. Agardh (1899)

Note: Parkinson (1980a) discussed various nomenclatural problems of species assigned to this genus.

Isabbottia* M.S. Balakrishnan 1980: 274.**Kintokiocolax* Tak. Tanaka et Nozawa 1960: 110.**

Note: When first described, this genus was placed in the Gigartinales. Examining both new collections and type material, Kawaguchi and Yoshida (1986) observed reproductive features characteristic of the Halymeniaceae.

***Neoabbottiella* Perestenko 1982: 30.**

Synonyms: ***Abbotia*** Perestenko (1975) *nom. illeg.* (non Rafinesque 1836); ***Abbottia*** Perestenko (1977a) *nom. illeg.* (non F. Mueller 1875); ***Abbottea*** Perestenko (1977b) Note: Perestenko (1975) tentatively assigned this genus to the Dilseaceae, a family segregated from the Dumontiaceae by Bert (1965). But Abbott (1982) gave reasons not to recognize this segregate family. Perestenko (1982) proposed the new name *Neoabbottiella* to replace her illegitimate name *Abbotia* and the various iterations that she later proposed. Lindstrom (1985) examined type material of *N. araneosa* (Perestenko) S.C. Lindstrom and observed ampullae characteristic of the Cryptonemiaceae [=Halymeniaceae] and therefore transferred this genus of eastern Russia from the Dumontiaceae to that family.

Norrissia* M.S. Balakrishnan 1980: 279.**Pachymenia*** J. Agardh 1876: 143.***Polyopes*** J. Agardh 1849: 85.

Synonym: ***Sinkoraena*** H.-B. Lee, J.A. Lewis, Kraft et I.K. Lee (1997)

Note: Kawaguchi et al. (2002) offered reasons for their proposed rejection of *Sinkoraena*.

Thamnoclonium Kützinger 1843: 392.***Yonagunia* Kawaguchi et Masuda in Kawaguchi et al. 2004: 181.*****Zymurgia* J.A. Lewis et Kraft 1992: 286.****Family Tsengiaceae⁴⁸*****Tsengia* K.C. Fan et Y.P. Fan 1962: 191.**

Note: Saunders and Kraft (2002) presented evidence, including molecular data, showing that *Tsengia* did not belong to the Nemastomataceae, where it had been

⁴⁷ In a study comparing rRNA gene sequences using many taxa from the Gigartinales and Rhodymeniales, Saunders and Kraft (1996) concluded that the merger of most families of the Gigartinales and Cryptonemiales into a single order as proposed by Kraft and Robins (1985) was supported. But two families, the Halymeniaceae and the Sebdeniaceae, were outliers, and so the order Halymeniales was established to accommodate them. Later, the Sebdeniaceae was found to have significant differences such that the family was removed to the resurrected order Sebdeniales (Withall and Saunders 2006).

⁴⁸ Saunders and Kraft (2002) established the family Tsengiaceae to include the single genus *Tsengia*.

assigned (Womersley and Kraft 1994, Masuda and Guiry 1995), but deserved to be placed in its own family in the Halymeniales.

Order Nemastomatales⁴⁹

Family Nemastomataceae

***Adelophycus* Kraft in Womersley 1994: 271.**

Synonym: ***Adelophyton* Kraft (1975) *nom. illeg.* (non Renault 1900)**

***Itonoa* Masuda et Guiry 1995: 60.**

Nemastoma* J. Agardh 1842: 89 [*'Nemostoma'*]. *nom. et orth. cons.

Synonym: *Gymnophlaea* Kützing (1843)

***Predaea* G. De Toni 1936: [5].**

Synonym: *Yadranela* Ercegovic (1949)

Note: Verlaque (1990) proposed the merger of *Yadranela* within *Predaea* by offering evidence that the type of the former genus, *Y. adriatica* Ercegovic, is a later taxonomic synonym of *Predaea ollivieri* Feldmann.

Family Schizymeniaceae

Platoma* Schousboe ex F. Schmitz 1894: 627. *nom. cons.

Schizymenia* J. Agardh 1851: 169. *nom. cons.

Synonyms: *Haematocelis* J. Agardh (1851); *Haematophloea* P. Crouan et H. Crouan (1858)

Note: Ardré (1977, 1980) conducted culturing studies to demonstrate that *Haematocelis rubens* J. Agardh, the type species of the genus, is the tetrasporophytic stage in the life history of *Schizymenia dubyi* (Chauvin ex Duby) J. Agardh. That relationship was also supported by a chemical study by Sciuto et al. (1979).

***Titanophora* (J. Agardh) Feldmann 1942: 111.**

***Wetherbeella* G.W. Saunders et Kraft 2002: 1258.**

Note: This genus was delineated on the basis of a pair of Australian species that had been earlier described in the genus *Platoma* (Womersley and Kraft in Womersley 1994).

Order Plocamiales⁵⁰

Family Plocamiaceae

***Plocamiocolax* Setchell 1923: 395.**

Plocamium* J.V. Lamouroux 1813: 137. *nom. cons.

Synonyms: *Nereidea* Stackhouse (1809) *nom. rej.*; *Plocamia* Stackhouse (1816); *Thamnophora* C. Agardh (1822); *Thamnocarpus* Kützing (1843) (non Harvey in Hooker 1844)

Family Pseudoanemoniaceae

***Hummbrella* S.A. Earle 1969: 1.**

Synonym: ***Pseudoanemonia* V.J. Chapman (1969)**

⁴⁹ Saunders and Kraft (2002) presented evidence supporting the reinstatement of Kylin's (1925) order Nemastomatales and for assigning to this order the families Nemastomataceae and Schizymeniaceae.

⁵⁰ Saunders and Kraft (1994) provided justification for the recognition of the new order Plocamiales.

Note: Hawkes and Johnson (1981) proposed the synonymy of *Pseudoanemonia tentacula* V.J. Chapman (described from New Zealand) with *Hummbrella hydra* S.A. Earle (described from Chile). Although Earle (1969) was uncertain of its taxonomic placement, Chapman (1969) created a new family (the Pseudoanemoniaceae) for this monotypic genus, tentatively placing the family in the Cryptonemiales, near the Gloiosiphoniaceae. On the basis of vegetative and reproductive morphology, Hawkes and Johnson (1981) assigned the family to the Gigartinales. Saunders and Kraft (1994) provisionally included the family in their new order Plocamiales.

Family Sarcodiaceae

***Chondrymenia* Zanardini 1860: 65.**

***Sarcodia* J. Agardh 1852: 622.**

Synonyms: *Rhodosarcodia* Kuntze (1898) *nom. illeg.*; *Carpococcus* J. Agardh (1876)

***Trematocarpus* Kützing 1843: 410.**

Synonym: *Dicurella* Harvey ex J. Agardh (1852)

Note: Searles (1969) offered evidence to propose the merger of *Dicurella* within *Trematocarpus*.

Order Sebdeniales⁵¹

Family Sebdeniaceae

***Crassitegula* C.W. Schneider, C.E. Lane et G.W. Saunders 2006: 121.**

***Sebdenia* (J. Agardh) Berthold 1882: 530.**

Order Rhodymeniales

Familia incertae sedis

***Agardhinula* De Toni 1897: 64.**

Synonym: *Diplocystis* J. Agardh (1896) *nom. illeg.* (non Trevisan 1848)

***Chamaebotrys* Huisman 1996: 105.**

***Erythrymenia* F. Schmitz ex Mazza 1921: 106.**

***Fryeella* Kylin 1930: 15.**

***Hymenocladia* J. Agardh 1852: 772.**

***Hymenocladiopsis* R.L. Moe 1986a: 1.**

***Minium* R.L. Moe 1979: 45.**

Family Rhodymeniaceae

***Asteromenia* Huisman et A. Millar 1996: 138.**

Note: Saunders et al. (2006) delineated the generic boundaries of *Asteromenia*, formerly considered a pan-tropical, monospecific genus, but now containing five species worldwide.

⁵¹ Based upon SSU and LSU rDNA sequences, Withall and Saunders (2006) elevated the Sebdeniaceae to ordinal status.

Botryocladia (J. Agardh) Kylin 1931: 17. *nom. cons.*
Synonyms: *Myriophylla* Holmes (1894); *Myrioglossa* Holmes (1896)

Cephalocystis A. Millar, G.W. Saunders, I.M. Strachan et Kraft 1996: 51.

Chrysymenia J. Agardh 1842: 105.

Synonyms: *Gloiohymenia* J. Agardh (1899); *Heterocystis* J. Agardh (1899); *Cryptarachne* (Harvey) Kylin (1931)
Note: Kylin (1956) recognized *Cryptarachne* as distinct from *Chrysymenia*. Some workers (e.g., Taylor 1960, Yoshida 1998, and Xia and Zhang 1999) have followed his taxonomy, whereas other workers (e.g., Abbott and Littler 1969, Silva et al. 1996, and Wynne 2005b) have regarded *Cryptarachne* as congeneric with *Chrysymenia*. Although not recognizing *Cryptarachne*, Saunders et al. (1999) pointed out that two types of *Chrysymenia* group molecularly in separate clades, one with *C. wrightii* in it, the other with *C. ornata*. *Chrysymenia ornata* is like the type of *Chrysymenia* (*C. ventricosa*) in lacking internal rhizoids; *C. wrightii*, however, is like the type of *Cryptarachne* in having internal rhizoids (Ben Maiz et al. 1987). But the type of *Cryptarachne*, *C. agardhii*, had not been sequenced.

Coelarthrum Børgesen 1910: 189.

Coelothrix Børgesen 1920: 389.

Cordylecladia J. Agardh 1852: 702.

Note: This genus, based upon the type *Cordylecladia erecta* (Greville) J. Agardh, was treated by Kylin (1956) as a taxonomic synonym of *Gracilaria*. Feldmann (1967) offered evidence that its correct placement is within the Rhodymeniaceae, confirming Newton's (1931) earlier assignment. Observations on its reproductive features by Brodie and Guiry (1988a) and on its gene-sequence data by Millar et al. (1996) confirm its position within the Rhodymeniaceae.

Drouetia G. De Toni 1938: 27.

Synonym: *Herpophyllum* Farlow (1902) (non *Herpophyllum* J. Agardh 1894)

Note: Saunders et al. (2006) offered morphological and tetrasporangial evidence to maintain this genus as distinct from *Halichrysis* and to move it from the Faucheaceae to the Rhodymeniaceae. Kylin (1956) had placed *Drouetia* in the synonymy of *Herpophyllum* Farlow, but De Toni (1938) replaced the latter name because of earlier use for a different type, *Herpophyllum* J. Agardh (1894), a red alga of still unknown affinities (found in "Incertae sedis" at the end of the list).

Erythrocolon J. Agardh in Grunow 1873/1874: 33.

Gloiosaccion Harvey 1859: pl. 83.

Grammephora N'Yeurt et Payri 2007: in press

Halichrysis (J. Agardh) F. Schmitz 1889: 444.

Synonym: *Weberella* F. Schmitz in Engler and Prantl (1896)

Note: Saunders et al. (2006) offered molecular and morphological evidence to circumscribe this genus and to move it from the Faucheaceae to the Rhodymeniaceae, where Saunders et al. (1999) had earlier speculated that it might belong.

Irvinea Guiry in Saunders et al. 1999: 38.

Note: An initial paper by Brodie and Guiry (1988b) pointed out several distinctive features of *Botryocladia ardeana*, including the strongly protruding cystocarps and cystocarps with 'tela arachnoidea'. Subsequently, this species was segregated into its own genus (Saunders et al. 1999). According to Afonso-Carrillo et al. (2006), *Irvinea* exists only at the molecular level as the genus is presently circumscribed.

Leptosomia (J. Agardh) J. Agardh 1892: 86.

Note: This taxon, based on an Australian type, originated as a subgenus of *Chrysymenia* (J. Agardh 1876). Kylin (1956) subsumed into this genus *Leptosarca*, with its four Antarctic species. But later Ricker (1987) showed that *Leptosarca* is congeneric with *Palmaria*. Womersley (1996) recognized *Leptosomia* as being "probably monotypic". The genus was characterized by its vegetative structure, with a central space between large medullary cells, within which coarse rhizoids develop. In older regions the spaces become filled by the rhizoids.

Maripelta E.Y. Dawson 1963a: 446.

Microphyllum Weber-van Bosse 1928: 464.

Rhodymenia Greville 1830: xlviii, 84. [*'Rhodomenia'*] *nom. et orth. cons.*

Synonyms: *Dendrymenia* Skottsberg (1923); *Epymenia* Kützting (1849); *Halopeltis* J. Agardh (1854)

Note: After narrowing the circumscription of *Rhodymenia* to exclude *R. palmata* (Linnaeus) Greville, assigning it to the genus *Palmaria* (Guiry 1974), Guiry (1977) gave an account of the genus based on its type species, *R. pseudopalmata* (J.V. Lamouroux) P.C. Silva. Womersley (1996) and Saunders et al. (1999) offered evidence supporting the merger of *Epymenia* within *Rhodymenia*. Wynne (2007) pointed out that *Dendrymenia*, a genus recognized by Kylin (1956), is based on the type *D. flabellifolia* (Bory de Saint-Vincent) Skottsberg, a species that lacks sympodial development, the alleged diagnostic trait of the genus. So *Dendrymenia* must be regarded as congeneric with *Rhodymenia*.

Rhodymeniocolax Setchell 1923: 395.

Sparlingia G.W. Saunders, I.M. Strachan et Kraft 1999: 37.

Family Faucheaceae⁵²

Cenacrum R. Ricker et Kraft 1979: 435.

Note: This genus was originally placed by Ricker and Kraft (1979) in the Rhodymeniaceae, but Saunders et al. (1999) moved it to the Faucheaceae.

⁵² Saunders et al. (1999) described the family Faucheaceae.

Faucheocolax Setchell 1923: 394.

Faucheopsis Kylin 1931: 9.

Gloiocladia J. Agardh 1842: 87.

Synonyms: *Faucha* Montagne et Bory de St.-Vincent in Durieu de Maisonneuve (1846); *Dichophycus* Zanardini (1847); **Gloiodermatopsis** Lindauer (1949).

Note: Rodríguez-Prieto et al. (2007) demonstrated that *Faucha* is congeneric with *Gloiocladia*. *Gloiodermatopsis* Lindauer (1949), a genus that was not included in Kylin (1956), was later proposed by Irvine and Guiry (1980) to be congeneric with *Faucha* (now *Gloiocladia*). Adams (1994), however, continued to recognize *Gloiodermatopsis*.

Gloiocolax Sparling 1957: 335.

Gloioderma J. Agardh 1851: 243.

Synonyms: *Horea* Harvey (1855); *Haligone* Kützing (1866); *Estebania* Setchell et N.L. Gardner (1924)

Note: Norris (1991b) proposed the merger of *Gloioderma* into *Gloiocladia*, but a recent paper by Dalen and Saunders (2007) resurrected this genus based upon DNA sequence data.

Leptofaucha Kylin 1931: 9.

Note: Dalen and Saunders (2007) recently reviewed and circumscribed this genus using molecular and morphological evidence.

Sciadophycus E.Y. Dawson 1944: 105.

Webervanbossea G. De Toni 1936: [5].

Synonym: *Bindera* Harvey 1859: pl. 111 *nom. illeg.* (non Rafinesque 1838)

Family Champiaceae

Champia Desvaux 1809: 245.

Synonyms: *Corinaldia* Trevisan (1843); *Mertensia* Thunberg ex Roth (1806) (non Roth 1797)

Champiocolax Bula-Meyer 1985: 429.

Chylocladia Greville in W.J. Hooker 1833: 256, 297 *nom. cons.*

Synonyms: *Kaliformis* Stackhouse (1809); *Gastridium* Lyngbye (1819) *nom. illeg.* (non Palisot de Beauvois 1812); *Gastrophycus* Link (1833); *Kaliformia* Stackhouse (1816)

Dictyothamnion A. Millar 1990: 375.

Gastroclonium Kützing 1843: 441 *nom. cons.*

Synonyms: *Sedoidea* Stackhouse (1809) *nom. rej.*; *Coeloseira* Hollenberg (1941)

Note: Although *Coeloseira* was recognized by Kylin (1956), Guiry (1978) pointed out that the grounds for maintaining it as distinct from *Gastroclonium* were not justified. His view was later supported by Irvine (1983).

Family Lomentariaceae

Binghamia J. Agardh 1894: 63.

Synonym: *Binghamiella* Setchell et E.Y. Dawson (1941)

Binghamiopsis I.K. Lee, J.A. West et Hommersand 1988: 2.

Ceratodictyon Zanardini 1878: 36.

Synonym: *Marchesettia* Hauck (1882)

Note: See Note under *Gelidiopsis* below.

Gelidiopsis F. Schmitz 1895: 148.

Note: This genus was assigned to the Gracilariaceae by Kylin (1956). Norris (1987b) proposed the merger of *Gelidiopsis* into *Ceratodictyon*. Price and Kraft (1991) presented reasons to maintain them as distinct genera and to transfer them both to the Rhodymeniaceae. Subsequently, Saunders et al. (1999) transferred *Ceratodictyon* and *Gelidiopsis* to the Lomentariaceae.

Lomentaria Lyngbye 1819: 101.

Synonyms: *Chondrothamnion* Kützing (1843); *Chondrosiphon* Kützing (1843); *Hooperia* J. Agardh (1896)

Semnocarpa Huisman, Foard et Kraft 1993: 145.

Stirnia M.J. Wynne 2001a: 164.

Genera incertae sedis (unassigned)

Chalicostroma Weber-van Bosse 1911: 32.

Chantransia ['Chantrania'] de Candolle 1801: 20. [Corrected to *Chantransia* by de Candolle in Lamarck and de Candolle, 1805]

Note: Although many of the species originally attributable to this genus have been linked as life-history stages of a number of genera in the Acrochaetiales, Bartrachospermales and Thoreales (Chiasson et al. 2007), several other species remain in this "form genus" without attribution (Guiry and Guiry 2007). Kylin (1956) listed *Chantransia* as a synonym of *Audouinella*, and Silva (in Farr 2007) reported its type as a synonym of *Lemanea*.

Endosira J. Agardh 1899: 105.

Enigma Weber-van Bosse in van Straelin 1932: 23.

Gracilariocolax Weber-van Bosse 1928: 393.

Herpophyllum J. Agardh 1894: 62.

Lobocolax M. Howe 1914: 90.

Perinema Weber-van Bosse 1911: 32.

Pseudochantransia Brand 1897: 318.

Note: A type species was not designated when this genus was validly published by Brand (1897). Thus, despite many of its several species having been transferred to other genera (e.g., Kumano 2002), the generic name remains viable as long as all of the species have not been accounted for taxonomically. Kylin (1956) did

not include *Pseudochantransia* in his survey of genera, and although he mentioned it several times, he did not place it in synonymy with any listed genus. In a few places, Kylin referred to “*Chantransia* Stadien” that were *Pseudochantransia* species according to Brand (1897), but the form genus *Chantransia* remains problematic itself [see Note above]. In his book on the freshwater red algae of the world, Kumano (2002) listed three species of *Pseudochantransia* as synonyms of *Audouinella* species but did not deal with the status of the genus itself. At least one species, *Pseudochantransia lemaneae* Brand (1910), does not appear to be listed under any other binomial at present (Guiry and Guiry 2007). Thus, we retain the genus in this uncertain position.

Rhodochortonopsis Yamada 1944: 23.

Note: This genus, based upon a single species from Japan, was known only from tetrasporic material. Norris (1991b) reported female material from KwaZulu-Natal, South Africa, that he thought was strongly suggestive of this genus. The collection was insufficient to provide an idea of its familial relationship.

Tiarophora J. Agardh 1890: 42.

Appendix I

Pachyarthron californicum (Decaisne) comb. nov.

Basionym: *Amphiroa californica* Decaisne, Mémoires sur les Corallines ou Polypiers calcifères. *Ann. Sci. Nat., Bot.*, Sér. 2, 18: 124. 1842.

Pachyarthron californicum subsp. ***schmittii*** (Manza) comb. nov.

Basionym: *Calliarthron schmittii* Manza, Some North Pacific species of articulated corallines. *Proc. Natl. Acad. Sci.* 23: 566. 1937b.

Pachyarthron chiloense (Decaisne) comb. nov.

Basionym: *Amphiroa chiloensis* Decaisne, Mémoires sur les Corallines ou Polypiers calcifères. *Ann. Sci. Nat., Bot.*, Sér. 2, 18: 125. 1842.

Pachyarthron compressum (Kloczcova) comb. nov.

Basionym: *Bossiella compressa* Kloczcova, De specie Bossiellae Silva (Corallinaceae, Rhodophyta) nova notula. *Novit. System. Plant. Non Vascul.* 15: 22, figs 1 and 2. 1978.

Pachyarthron cooperi (E.Y. Dawson et P.C. Silva) comb. nov.

Basionym: *Bossea cooperi* E.Y. Dawson et P.C. Silva in Dawson, Marine red algae of Pacific Mexico. Part I. Bangiales to Corallinaceae subf. Corallinoideae. *Allan Hancock Pacific Exped.* 17: 158, pl. 8, fig. 7; pl. 24, fig. 2. 1953.

Pachyarthron corymbiferum (Manza) comb. nov.

Basionym: *Bossea corymbifera* Manza, Some North Pacific species of articulated corallines. *Proc. Natl. Acad. Sci.* 23: 562. 1937b.

Pachyarthron frondescens (Postels et Ruprecht) comb. nov.

Basionym: *Corallina frondescens* Postels et Ruprecht, *Illustrationes algarum...* Typis E. Pratz, Petropoli: 20, pl. 40, fig. 105. 1840.

Pachyarthron gardneri (Manza) comb. nov.

Basionym: *Bossea gardneri* Manza, Some North Pacific species of articulated corallines. *Proc. Natl. Acad. Sci.* 23: 563. 1937b.

Pachyarthron insulare (E.Y. Dawson et P.C. Silva) comb. nov.

Basionym: *Bossea insularis* (E.Y. Dawson et P.C. Silva in Dawson, Marine red algae of Pacific Mexico. Part I. Bangiales to Corallinaceae subf. Corallinoideae. *Allan Hancock Pacific Exped.* 17: 159, pl. 8, figs., 5–6; pl. 25, fig. 2. 1953.

Pachyarthron interruptum (Manza) comb. nov.

Basionym: *Bossea interrupta* Manza, Some North Pacific species of articulated corallines. *Proc. Natl. Acad. Sci.* 23: 563. 1937b.

Pachyarthron ligulatum (E.Y. Dawson) comb. nov.

Basionym: *Bossea ligulata* E.Y. Dawson, Marine red algae of Pacific Mexico. Part I. Bangiales to Corallinaceae subf. Corallinoideae. *Allan Hancock Pacific Exped.* 17: 156, pl. 8, fig. 8; pl. 26, fig. 2. 1953.

Pachyarthron orbignianum (Decaisne) comb. nov.

Basionym: *Amphiroa orbigniana* Decaisne, Mémoires sur les Corallines ou Polypiers calcifères. *Ann. Sci. Nat., Bot.*, Sér. 2, 18: 124. 1842.

Pachyarthron orbignianum subsp. ***dichotomum*** (Manza) comb. nov.

Basionym: *Bossea dichotoma* Manza, Some North Pacific species of articulated corallines. *Proc. Natl. Acad. Sci.* 23: 562. 1937b.

Pachyarthron pachycladum (W.R. Taylor) comb. nov.

Basionym: *Bossea pachyclada* W.R. Taylor, Pacific marine algae of the Allan Hancock Expeditions to the Galapagos Islands. *Allan Hancock Pacific Expeditions* 12: 194, pl. 58. 1945.

Pachyarthron plumosum (Manza) comb. nov.

Basionym: *Bossea plumosa* Manza, The genera of the articulated corallines. *Proc. Natl. Acad. Sci.* 23: 46. 1937a.

Pachyarthron sagittatum (E.Y. Dawson et P.C. Silva) comb. nov.

Basionym: *Bossea sagittata* E.Y. Dawson et P.C. Silva in Dawson, Marine red algae of Pacific Mexico. Part I. Bangiales to Corallinaceae subf. Corallinoideae. *Allan Hancock Pacific Exped.* 17: 157, pl. 8, fig. 1; pl. 32, figs. 1–2. 1953.

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