

8-2010

# Addendum to the Synoptic Review of Red Algal Genera

Michael J. Wynne

*University of Michigan - Ann Arbor*

Craig W. Schneider

*Trinity College, craig.schneider.1@trincoll.edu*

Follow this and additional works at: <http://digitalrepository.trincoll.edu/facpub>

 Part of the [Biology Commons](#)

---

## Review

# Addendum to the synoptic review of red algal genera

Michael J. Wynne<sup>1,\*</sup> and Craig W. Schneider<sup>2</sup>

<sup>1</sup> Department of Ecology and Evolutionary Biology and Herbarium, University of Michigan, Ann Arbor, MI 48109, USA, e-mail: mwynne@umich.edu

<sup>2</sup> Department of Biology, Trinity College, Hartford, CT 06106, USA

\* Corresponding author

## Abstract

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

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

## Introduction

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

necessary changes. We plan to provide further addenda periodically as sufficient new published information appears.

## Format of the list

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

## List of genera

### Kingdom Plantae

### Subkingdom Rhodophyta

### Phylum Cyanidiophyta

### Class Cyanidiophyceae

### Order Cyanidiales

### Family Cyanidiaceae

*Cyanidium* Geitler 1933: 624.

Synonym: *Pluto* J.J. Copeland (1936).

Note: The name *Pluto*, originally regarded as a genus of Cyanophyceae (Smith 1950), was not listed in Kylin (1956) nor in Schneider and Wynne (2007). The generitype of *Pluto*, *P. caldarius* (Tilden) J.J. Copeland, was based on the same basonym as Geitler's *Cyanidium caldarium* (Tilden) Geitler, namely, *Protococcus botryoides* f. *caldarius* Tilden (1898) described from the bottom of a hot spring (temperature, 38°C) in Yellowstone National Park, USA. Thus, the names are homotypic synonyms, Geitler's generic name having priority.

### Order Cyanidioschyzonales F.D. Ott (2009)

### Family Cyanidioschyzonaceae F.D. Ott (2009)

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

### Phylum Rhodophyta

### Subphylum Rhodellophytina

### Class Rhodellophyceae

### Order Dixonieiales

Note: This new order was established by Yokoyama et al. (2009).

**Family Glaucosphaeraceae**

Synonym: Dixonellaceae.

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

***Neorhodella* J.L. Scott, A. Yokoyama, C. Billard, J. Fresnel et J.A. West in Scott et al. 2008: 561.**

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

**Order Rhodellales****Family Rhodellaceae**

***Corynoplastis* A. Yokoyama, J.L. Scott, G. Zuccarello, M. Kajikawa, Y. Hara et J.A. West 2009: 284.**

Note: This monotypic new genus was established on the basis of *Corynoplastis japonica*, with a type locality of Tateiwa, Tobishima Island, Sakata-shi, Yamagata, Japan.

**Class Stylonematophyceae****Order Rufusiales**

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

**Family Rufusiaceae**

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

**Order Stylonematales**

Synonym: Chrootheceales F.D. Ott (2009).

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

**Family Stylonemataceae**

Synonym: Chrootheceaceae F.D. Ott (2009).

Note: See above.

***Chroothece* Hansgirg in Wittrock and Nordstedt 1884: 696.** Synonym: *Zachariasia* Lemmermann (1895).

Note: Schneider and Wynne (2007) assigned *Zachariasia* to the Bangiaceae in agreement with the opinions of Geitler (1942), Drouet and Daily (1956) and others. The genus was originally thought to belong to the cyanophycean family

Chroococcaceae (Lemmermann 1895). Ott (2009) discussed the history of the various treatments of *Zachariasia* and concluded by transferring the type species, *Z. endophytica*, into *Chroothece*.

**Class Porphyridiophyceae****Order Porphyridiales****Family Porphyridiaceae**

***Erythrolobus* J.L. Scott, B. Baca, F.D. Ott et J.A. West 2006: 408.**

Note: This name was misspelled as ‘‘*Erythrolobus*’’ in our previous synoptic review (Schneider and Wynne 2007).

**Subphylum Metarhodophytina****Class Compsopogonophyceae****Order Erythropeltiales****Family Erythrotrichaceae**

***Madagascaria* J.A. West et N. Kikuchi in Zuccarello et al. 2010: 370.**

Note: This monotypic genus was based on *Madagascaria erythrocladioides* J.A. West et N. Kikuchi in Zuccarello et al. (2010) from the intertidal of Ampasi Pohry, Nossi Be, Madagascar.

***Pseudoerythrocladia* J.A. West et G.C. Zuccarello in Zuccarello et al. 2010: 369.**

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

***Smithora* Hollenberg 1959: 3.**

Synonym: *Membranella* Hollenberg et I.A. Abbott (1968).

Note: West and Zuccarello (2009) offered evidence to treat *Membranella* as a taxonomic synonym of *Smithora*.

**Subphylum Eurhodophytina****Class Bangiophyceae****Order Bangiales****Family Bangiaceae**

***Bangia* Lyngbye 1819: 82.**

Synonym: ***Bangiadulcis* W.A. Nelson 2007: 885.**

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

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

Synonym: *Pyropia* J. Agardh (1899).

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

## Class Florideophyceae

### Subclass Hildenbrandiophycidae

#### Order Hildenbrandiales

##### Family Hildenbrandiaceae

*Hildenbrandia* Nardo 1834: 676 [“*Hildenbrandtia*”] *nom. et orth. cons.*

Note: *Pleurocapsa cuprea* Hansgirg, which had been originally described as a cyanophycean taxon, was recognized as a species of *Hildenbrandia* and transferred to that genus as *H. cuprea* (Hansgirg) Caisová *et* Kopecky by Caisová and Kopecky (2008).

### Subclass Nemaliophycidae

#### Order Acrochaetiales

##### Family Acrochaetiaceae

*Acrochaetium* Nägeli in Nägeli and Cramer 1858: 532.

Synonym: *Rhodochortonopsis* Yamada (1944).

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

*Grania* (Rosenvinge) Kylin 1944: 26.

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

#### Order Batrachospermales

##### Family Batrachospermaceae

*Kumanoa* T.J. Entwisle, M.L. Vis, W.B. Chiasson,

O. Necchi *et* A.R. Sherwood 2009: 709.

Note: Entwisle *et al.* (2009) established *Kumanoa*, based on the type species *K. virgato-decaisneana* (Siroidot) Entwisle, M.L. Vis, W.B. Chiasson, Necchi *et* A.R. Sherwood from France, as a segregate genus out of *Batrachospermum*.

#### Order Nemaliales

##### Family Liagoraceae

*Nemalion* Duby 1830: 959.

Synonym: *Boanema* Ercegović (1927).

Note: In Geitler’s (1942) opinion, *Boanema*, which was described from the island of Ciovo, Croatia (Adriatic Sea) as a cyanophycean genus assigned to the new family Bo-

nemataceae in the order Stigonematales, is a developmental stage of *Nemalion*.

## Family Galaxauraceae

*Dichotomaria* Lamarck 1826: 143.

Synonym: *Alysium* C. Agardh (1823).

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

## Order Rhodachlyales

### Family Rhodachlyaceae

*Rhodachlya* J.A. West, J.L. Scott, K.A. West, U. Karsten, S.L. Clayden *et* G.W. Saunders 2008: 205.

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

## Order Palmariales

### Family Meiodiscaceae

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

*Rubrointrusa* S.L. Clayden *et* G.W. Saunders 2010: 296.

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

## Family Rhodophysemataceae

*Rhodophysema* Batters 1900: 377.

Synonym: *Halosaccicolax* S. Lund (1959).

Note: By their transfer of *Halosaccicolax kjellmanni* S. Lund, the type species of the genus, to *Rhodophysema*, Clayden and Saunders (2010) effected the merger of the former genus with the latter.

*Rhodonematella* S.L. Clayden *et* G.W. Saunders 2010: 297.

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

## Subclass Corallinophycidae

### Order Sporolithales

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

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

### Family Sporolithaceae

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

### Order Corallinales

#### Family Corallinaceae

##### Subfamily Corallinoideae

*Bossiella* P.C. Silva 1956: 46.

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

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

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

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

*Pachyarthron* Manza 1937: 45.

Note: See note under *Bossiella*.

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

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

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

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

### Family Hapalidiaceae

#### Subfamily Choreonematoideae

*Choreonema* F. Schmitz 1889: 455.

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

Note: *Endosiphonia* Ardissonne *nom. illeg.*, a later homonym of *Endosiphonia* Zanardini (1878), was omitted in the previous red algal synoptic review (Schneider and Wynne

2007). Schmitz' name *Choreonema* was a *nom. nov.* to replace Ardissonne's *Endosiphonia*.

#### Subfamily Melobesioideae

*Mesophyllum* Me. Lemoine 1928: 251.

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

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

### Subclass Rhodymeniophycidae

#### Order Ceramiales

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

#### Family Callithamniaceae

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

#### Family Ceramiaceae

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

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

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

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

#### Family Inkyuleaceae

Includes: *Inkyuleea*.

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

**Family Spyridiaceae**

Includes: *Spyridia*.

Note: This is presently a monotypic family (Choi et al. 2008).

**Family Wrangeliaceae**

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

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

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

***Ptilothamnionopsis* P.S. Dixon 1971: 61.**

Note: The spelling of this generic name is now corrected from the incorrect spelling in Schneider and Wynne (2007).

*Radiathamnion*, *Rhipidothamnion*, *Rhododictyon*, *Seagrieffia*, *Shepleya*, *Spermothamnion*, *Sphondylothamnion*, *Spongoclonium*,

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

*Tanakaella*, *Tiffaniella*,

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

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

*Wollastoniella*, *Wrangelia*,

***Zonariophila* Stegenga et Kempermann 1996: 126.**

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

**Genera incertae sedis** (formerly included in Ceramiaceae *sensu lato* but presently of uncertain position with the recent division of the family into several families):

*Callidictyon*, *Perischelia*, *Pterocladopsis*, *Ptilocladopsis*, *Scagelonema*, *Skeletonella*, *Spencerella*, *Warrenia*.

**Family Delesseriaceae**

***Erythrogllossum* J. Agardh 1898: 174.**

Synonym: *Schizoneurina* Doweld (2003).

Note: Doweld's (2003) action to replace *Schizoneura* (J. Agardh) J. Agardh (1898) *nom. illeg.* (non Schimper et Mou-

geot 1844) was taxonomically unnecessary in that the lectotype of *Schizoneura*, *S. subcostata* (J. Agardh) J. Agardh, is currently regarded as *Erythrogllossum subcostatum* (J. Agardh) Ardré (Ardré 1970). *Schizoneurina* would become available if taxonomic evidence were offered to justify the separation of *E. subcostatum* from *Erythrogllossum*.

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

**Family Rhodomelaceae**

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

Synonym: *Stictosiphonia* J.D. Hooker et Harvey in Hooker (1847).

Note: Further evidence justifying the return of *Stictosiphonia*, segregated by King and Puttock (1989), to *Bostrychia* was offered by Zuccarello and West (2008).

***Palisada* K.W. Nam 2007: 53.**

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

***Polysiphonia* R. Greville 1823: ad. t. 90, *nom. cons.***

Synonym: *Polyochetum* Chevallier (1836).

Note: The above synonym did not appear in Kylin (1956) nor in Schneider and Wynne (2007).

***Yuzurua* (K.W. Nam) Martin-Lescanne in Martin-Lescanne et al. 2010: 59.**

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

**Order Gelidiales****Family Gelidiaceae**

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

Synonym: *Acropeltis* Montagne (1837).

Note: Although we previously followed Kylin (1956) in indicating Montagne (1839) as the date of validation of this generic name, Montagne (1837) had validated this generic name earlier.

**Order Acrosymphytales****Family Acrosymphytaceae**

***Acrosymphyton* Sjöstedt 1926: 8.**

Synonym: *Helminthiopsis* J. Agardh (1899) *nom. illeg.*, non *Helminthopsis* Heer (1877).

Note: The name *Helminthiopsis* of J. Agardh, which was omitted in our red algal synoptic review (Schneider and Wynne 2007), is treated as a later homonym and is thus illegitimate.

***Acrosymphytonema* C.-F. Boudouresque, M. Perret-Boudouresque et M. Knoepffler-Peguy 1984: 46, nom. ined.**

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

## Order Gigartinales

### Family Caulacanthaceae

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

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

### Family Endocladaceae

***Endocladia* J. Agardh 1842: 449.**

Synonym: *Acanthocladia* Ruprecht (1851).

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

### Family Kallymeniaceae

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

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

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

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

## Order Peyssonneliales

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

### Family Peyssonneliaceae

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

Note: This genus was established on the single species *Ramicrusta nanhaiensis* D.R. Zhang et J.H. Zhou, regarded as endemic to waters of China. A second species, *R. textilis* Pueschel et G.W. Saunders, occurring in the Caribbean Sea,

has been described by Pueschel and Saunders (2009), who supported the generic concept with molecular evidence.

## Order Nemastomatales

### Family Schizymeniaceae

***Peyssonneliopsis* Setchell 1905: 62.**

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

## Order Rhodymeniales

### Family Champiaceae

***Coelothrix* Børgesen 1910: 389.**

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

***Neogastroclonium* L. Le Gall, Dalen et G.W. Saunders 2008: 1569.**

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

### Family Faucheaceae

***Gloiocladia* J. Agardh 1842: 87.**

Synonym: *Endosira* J. Agardh (1899).

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

### Family Fryeellaceae

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

### Family Hymenocladaceae

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

### Family Rhodymeniaceae

***Grammephora* N'Yeurt et Payri 2007: 287.**

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

***Halopeltis*** J. Agardh 1854: 110.

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

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

#### **Incertae sedis**

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

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

#### **Incertae sedis generalis**

***Selkia*** Klebahn 1939: 182.

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

#### **Acknowledgements**

We thank Drs A. Athanasadiadis, E.K. Ganesan, G.T. Kraft, H. Stegenga and J.A. West for useful comments and corrections.

#### **References**

- Agardh, J.G. 1899. *Analecta algologica*. V. *Acta Universitatis Lund.* 35: 160 pp., 3 pls.
- Alongi, G., M. Cormaci and G. Furnari. 2007. *Woelkerlingia minuta* gen. et. sp. nov. from the Mediterranean Sea and a reassessment of the genus *Lomathamion* with the description of two new genera: *Hommersandiella* gen. nov. and *Stegengaea* gen. nov. (Ceramiales, Rhodophyta). *Cryptogam., Algol.* 28: 311–324.
- Ardre, F. 1970. Contribution a l'étude des algues marines du Portugal. I. La flore. *Portug. Acta Biol. (B)* 10: 1–423, 56 pls.
- Blankinship, J.W. and C.A. Keeler. 1892. On the natural history of the Farallon Islands. *Zoe* 3: 144–165.
- Boudouresque, C.F., M. Perret-Boudouresque and M. Knoepffler-Peguy. 1984. Inventaire des algues marines benthiques dans les Pyrénées-Orientales (Méditerranée, France). *Vie et Milieu* 34: 41–59.
- Cabioch, J. and M.L. Mendoza. 2003. *Mesophyllum expansum* (Philippi) comb. nov. (Corallinales, Rhodophytes), et mise au point sur les *Mesophyllum* des mers d'Europe. *Cahiers Biol. Mar.* 44: 257–273.
- Caisová, L. and J. Kopecky. 2008. Relation of *Pleurocapsa cuprea* Hansgirg to the genus *Hildenbrandia* (Rhodophyta). *Phycologia* 47: 404–415.
- Cho, T.O., S.M. Boo, M.H. Hommersand, C.A. Maggs, L. McIvor and S. Fredericq. 2008. *Gayliella* gen. nov. in the tribe Ceramiales (Ceramiales, Rhodophyta) based on molecular and morphological evidence. *J. Phycol.* 44: 721–738.
- Choi, H.-G., G.T. Kraft, H.-S. Kim, M.D. Guiry and G.W. Saunders. 2008. Phylogenetic relationships among lineages of the Ceramiales (Ceramiales, Rhodophyta) based on nuclear small subunit rDNA sequence data. *J. Phycol.* 44: 1033–1048.
- Clayden, S.L. and G.W. Saunders. 2008. Resurrecting the red algal genus *Grania* within the order Acrochaetales (Florideophyceae, Rhodophyta). *Eur. J. Phycol.* 43: 151–162.
- Clayden, S.L. and G.W. Saunders. 2010. Recognition of *Rubrointrusa membranacea* gen. et comb. nov., *Rhodonematella subimmersa* gen. et comb. nov. (with a re-interpretation of the life history) and the Meiodiscaceae fam. nov. within the Palmariales (Rhodophyta). *Phycologia* 49: 283–300.
- Copeland, J.J. 1936. Yellowstone thermal Myxophyceae. *Ann. New York Acad. Sci.* 36: 1–232.
- D'Archino, R., W.A. Nelson and G.C. Zuccarello. 2010. *Psaromenia* gen. nov. (Kallymeniaceae, Rhodophyta): a new genus for *Kallymenia berggrenii*. *Phycologia* 49: 73–85.
- De Luca, P., R. Taddei and L. Varano. 1978. "*Cyanidioschyzon merolae*": a new alga of thermal acidic environments. *Webbia* 33: 37–44.
- De Toni, G.B. 1900. *Sylloge algarum... Vol. 4. Florideae. (2)*. Padova. pp. 387–776.
- De Toni, G.B. 1924. *Sylloge algarum... Vol. 6. Florideae. (5). Additamenta*. Padova. xi + 767 pp.
- Doweld, A.B. 2003. *Schizoneurina*, a new generic name of Rhodymeniophyta. *Byull. Moskovsk. Obshch. Ispyt. Prirody Otdel Biol.* 108: 88–89.
- Drew, K.M. 1956. *Conferva ceramicola* Lyngbye. *Bot. Tidsskr.* 53: 67–74.
- Drouet, F. and W.A. Daily. 1956. Revision of the coccoid Myxophyceae. *Butler Univ. Bot. Stud.* 12: 1–218.
- Entwisle, T.J., M.L. Vis, W.B. Chiasson, O. Necchi Jr. and A.R. Sherwood. 2009. Systematics of the Batrachospermales (Rhodophyta) – a synthesis. *J. Phycol.* 45: 704–715.
- Ercegović, A. 1927. Tri nova roda litofitskih cijanoficeja sa jadranske obale. (Trois nouveaux genres des Cyanophycées lithophytes de la côte adriatique.) *Acta Bot. Inst. Bot. Univ. Zabravensis* 2: 78–84.
- Gabrielson, P.W., T.B. Widdowson and S.C. Lindstrom. 2004. Keys to the seaweeds and seagrasses of Oregon and California, north of Point Conception. *Phycol. Contr.* 6. PhycoID, Hillsborough, NC. iv + 181 pp.
- Geitler, L. 1942. Schizophyta: Klasse Schizophyceae. In: (A. Engler and K. Prantl) *Natürliche Pflanzenfamilien*. 2. Aufl. Bd. 1b. Duncker and Humblot, Berlin. iv + 232 pp.
- Harvey, W.H. 1853. *Nereis boreali-americana...* Part II. Rhodospermeae. *Smithsonian Contr. Knowledge* 5: 258 pp., pls XIII–XXXVI.
- Hommersand, M.H., R.L. Moe, C.D. Amsler and S. Fredericq. 2009. Notes on the systematics and biogeographical relationships of Antarctic and sub-Antarctic Rhodophyta with descriptions of four new genera and five new species. *Bot. Mar.* 52: 509–534.
- Huisman, J.M., F. Leliaert, H. Verbruggen and R.A. Townsend. 2009. Marine benthic plants of Western Australia's shelf-edge atolls. *Rec. Western Aust. Suppl. No.* 77: 50–87.
- Index Nominum Algarum. 2010. University Herbarium, University of California, Berkeley. Compiled by Paul Silva. <http://ucjeps.berkeley.edu/INA.html>.
- Irvine, D.E.G. and M.D. Guiry. 1980. Taxonomy of the Rhodymeniales. In: (T.V. Desikachary and V.N. Raja Rao, eds) *Taxonomy of algae*. Papers presented at the International Symposium on Taxonomy of Algae held at the Centre of Advanced Study I Botany, University of Madras, December 9–16, 1974. University of Madras, Madras. pp. 288–303, 2 pls.
- Johansen, H.W. 1969. Morphology and systematics of coralline algae with special reference to *Calliarthron*. *Univ. Calif. Publ. Bot.* 49: vi + 98 pp.



- Kim, J.H., M.D. Guiry, J.H. Oak, D.-S. Choi, S.-H. Kang, H. Chung and H.-G. Choi. 2007. Phylogenetic relationships within the tribe Janieae (Corallinales, Rhodophyta) based on molecular and morphological data: a reappraisal of *Jania*. *J. Phycol.* 43: 1310–1319.
- King, R.J. and C.F. Puttock. 1989. Morphology and taxonomy of *Bostrychia* and *Stictosiphonia* (Rhodomelaceae/Rhodophyta). *Aust. Syst. Bot.* 2: 1–73.
- Kitayama, T. 2009. The identity of the endozoic red alga *Rhodochortonopsis spongicola* Yamada (Acrochaetiales, Rhodophyta). *Bull. Natl. Mus. Nat. Sci. Ser. B*, 35: 183–187.
- Klebahn, H. 1939. Zwei nichtgrüne Algen des Süßwassers. *Beih. Bot. Centralbl.* 59A: 173–187.
- Kravesky, D.M., J.N. Norris, P.W. Gabrielson, D. Gabriel and S. Fredericq. 2009. A new order of red algae based on the Peyssoneliaceae, with an evaluation of the ordinal classification of the Florideophyceae (Rhodophyta). *Proc. Biol. Soc. Wash.* 122: 364–391.
- Kylin, H. 1941. Californische Rhodophyceen. *Acta Univ. Lund., N.F., Avd. 2*, 37: 51 pp., 13 pls.
- Kylin, H. 1944. Die Rhodophyceen der Schwedischen Westküste. *Acta Univ. Lund., N.F., Avd. 2*, 40: 104 pp.
- Kylin, H. 1956. *Die Gattungen der Rhodophyceen*. C.W.K. Gleerups, Lund. xv + 673 pp.
- Le Gall, L., J.L. Dalen and G.W. Saunders. 2008. Phylogenetic analyses of the red algal order Rhodymeniales supports recognition of the Hymenocladaceae fam. nov., Fryeellaceae fam. nov., and *Neogastroclonium* gen. nov. *J. Phycol.* 44: 1556–1571.
- Le Gall, L., C.E. Payri, L. Bittner and G.W. Saunders. 2010. Multigene phylogenetic analyses support recognition of the Sporolithales ord. nov. *Mol. Phylog. Evol.* 54: 302–305.
- Lemmermann, E. 1895. Verzeichnis der in der Umgegend von Ploen gesammelten Algen. *Forschungsber. Biol. Stat. Plön* 3: 18–67.
- Lynch, M.D.J., R.G. Sheath and K.M. Müller. 2008. Phylogenetic position and ISSR-estimated intraspecific genetic variation of *Bangia maxima* (Bangiales, Rhodophyta). *Phycologia* 47: 599–613.
- Martin-Lescanne, J., F. Rousseau, B. de Reviere, C. Payri, A. Coullou, C. Cruaud and L. Le Gall. 2010. Phylogenetic analyses of the *Laurencia* complex (Rhodomelaceae, Ceramiales) support recognition of five genera: *Chondrophycus*, *Laurencia*, *Osmundea*, *Palisada* and *Yuzurua* stat. nov. *Eur. J. Phycol.* 45: 51–61.
- McNeill, J., F.R. Barrie, H.M. Burdet, V. Demoulin, D.L. Hawksworth, K. Marhold, D.H. Nicolson, J. Prado, P.C. Silva, J.E. Skog, J.H. Wiersema and N.J. Turland (eds.). 2006. *International Code of Botanical Nomenclature (Vienna Code) adopted by the Seventeenth International Botanical Congress, Vienna, Austria, July 2005*. Regnum Veg. 146. A.R.G. Gantner, Verlag KG, Rugell. pp. xviii + 568.
- Montagne, J.F.C. 1837. Centurie de plantes cellulaires exotiques nouvelles. *Ann. Sci. Nat., Sér. II*, 8: 345–370.
- Montagne, J.F.C. 1839. Florula Bolivienensis stirpes novae et minus cognitae. Plantae cellulares – I. d'Orbigny, A. *Voyage dans l'amerique meridionale* 7: 1–39.
- Müller, K.M., M.C. Oliveira, R.G. Sheath and D. Bhattacharya. 2001. Ribosomal DNA phylogeny of the Bangiophycidae (Rhodophyta) and the origins of secondary plastids. *Am. J. Bot.* 88: 1390–1400.
- Nam, K.W. 1999. Morphology of *Chondrophycus undulata* and *C. parvipapillata* and its implications for the taxonomy of the *Laurencia* (Ceramiales, Rhodophyta) complex. *Eur. J. Phycol.* 34: 455–468.
- Nam, K.W. 2006. Phylogenetic re-evaluation of the *Laurencia* complex (Rhodophyta) with a description of *L. succulenta* sp. nov. from Korea. *J. Appl. Phycol.* 18: 679–697.
- Nam, K.W. 2007. Validation of the generic name *Palisada* (Rhodomelaceae, Rhodophyta). *Algae* 22: 53–55.
- Nelson, W.A. 2007. *Bangiadulcis* gen. nov.: a new genus for freshwater filamentous Bangiales (Rhodophyta). *Taxon* 56: 883–886.
- N'Yeurt, A.D.R. and C.E. Payri. 2007. *Grammephora peyssonelioides* gen. et sp. nov. (Rhodophyta, Rhodymeniaceae) from the Solomon Islands, South Pacific. *Phycol. Res.* 55: 286–294.
- Ott, F.D. 2009. *Handbook of the taxonomic names associated with the non-marine Rhodophycophyta*. J. Cramer, Berlin and Stuttgart. 969 pp.
- Pfeiffer, L. 1871–1873. *Nomenclator botanicus...* Vol. 1, part 1. Theodor Fischer, Cassel.
- Pueschel, C.W. and G.W. Saunders. 2009. *Ramicrusta textilis* sp. nov. (Peyssoneliaceae, Rhodophyta), an anatomically complex Caribbean alga that overgrows corals. *Phycologia* 48: 480–491.
- Saunders, G.W. and M.H. Hommersand. 2004. Assessing red algal supraordinal diversity and taxonomy in the context of contemporary systematic data. *Amer. J. Bot.* 91: 1494–1507.
- Saunders, G.W. and B. McDonald. 2010. DNA barcoding reveals multiple overlooked Australian species of the red algal order Rhodymeniales (Florideophyceae), with resurrection of *Halopeltis* J. Agardh and description of *Pseudohalopeltis* gen. nov. *Botany* 88: in press.
- Schneider, C.W. and M.J. Wynne. 2007. A synoptic review of the classification of red algal genera a half a century after Kylin's "Die Gattungen der Rhodophyceen". *Bot. Mar.* 50: 197–249.
- Scott, J., A. Yokoyama, C. Billard, J. Fresnel, Y. Hara, K.A. West and J.A. West. 2008. *Neorhodella cyanea*, a new genus in the Rhodellophyceae (Rhodophyta). *Phycologia* 47: 560–572.
- Scott, J., A. Yokoyama, C. Billard, J. Fresnel, Y. Hara, K.A. West and J.A. West. 2009. Corrigendum. *Phycologia* 48: 136.
- Setchell, W.A. 1905. Parasitic Florideae of California. *Nuova Notarisa* 16: 59–63.
- Setchell, W.A. and N.L. Gardner. 1903. Algae of northwestern America. *Univ. Calif. Publ. Bot.* 1: 165–418 [-419].
- Shevejko, S.V. 1982. Novaya krasnaya izvestkovaya vodorosl'. [A new red calcareous alga]. In: *Biologiya korallovykh rifov. Soobshchestva priavstralijskikh vod.* [Biology of coral reefs. Associations in Australian near-shore waters], pp. 26–28. Akademiya Nauk SSSR, Dal'nevostochnyj Nauchnyj Tsentr, Institut Biologii Morya, Vladivostok. [n.v.].
- Silva, P.C. and W.A. Nelson. 2008. History of the typification of conserved and rejected names, including an account of the typification of *Bangia* Lyngb. (*Bangiaceae*, *Rhodophyta*). *Taxon* 57: 1351–1354.
- Skuja, H. 1954. III. Abteilung: Glaucophyta. In: (H. Melchior and E. Werdermann, eds.) *A. Engler's Syllabus der Pflanzenfamilien...* 12. Aufl. 1. Band, Borntraeger, Berlin. pp. 56–57.
- Smith, G.M. 1950. *The fresh-water algae of the United States*. 2nd edition. McGraw-Hill Book Co., Inc., New York. vii + 719 pp.
- Smith, G.M. and G.J. Hollenberg. 1943. On some Rhodophyceae from the Monterey Peninsula, California. *Amer. J. Bot.* 30: 211–223.
- Stegenga H. and T.C.M. Kempermann. 1996. Notes on Ceramiaceae (Rhodophyta) from the Eastern Cape Province, South Africa. II. *Zonariophila semiendophytica* nov. gen., nov. spec., a minute epilendophyte of *Zonaria subarticulata* (Lamour.) Papenf. *Blumea* 41: 125–134.
- Tilden, J.E. 1898. Observations on some West American thermal algae. *Bot. Gaz.* 25: 89–105, pls 8–10.
- Townsend, R.A., W.J. Woelkerling, A.S. Harvey and M. Borowitzka. 1995. An account of the red algal genus *Sporolithon* (Sporolithales, Rhodophyta).

- rolithaceae, Corallinales) in southern Australia. *Aust. Syst. Bot.* 8: 85–121.
- Verheij, E. 1993. The genus *Sporolithon* (Sporolithaceae fam. nov., Corallinales, Rhodophyta) from the Spermonde Archipelago, Indonesia. *Phycologia* 32: 184–196.
- Weber-van Bosse, A. 1921. *Liste des algues du Siboga, II: Rhodophyceae, Première partie: Protofloridae, Nemalinales, Cryptonemiales*. Siboga-Expeditie. Monographie 59b. E. J. Brill, Leiden. pp. 187–310, pls. VI–VIII.
- West, J.A. and G.C. Zuccarello. 2009. Taxonomic deflation: molecular evidence places *Membranella nitens* in taxonomic synonymy with *Smithora naiadum* (Erythropeltiales, Compsopogonophyceae, Rhodophyta). *Phycologia* 48: 543–546.
- West, J.A., J.L. Scott, K.A. West, U. Karsten, S.L. Clayden and G.W. Saunders. 2008. *Rhodachlya madagascarensis* gen. et sp. nov.: a distinct acrochaetoid representing a new order and family (Rhodachlyales ord. nov., Rhodachlyaceae fam. nov.) of the Florideophyceae (Rhodophyta). *Phycologia* 47: 203–212.
- Woelkerling, W.J. 1983. A taxonomic reassessment of *Lithophyllum* (Corallinaceae, Rhodophyta) based on studies of R.A. Phillipi's original collections. *Br. Phycol. J.* 18: 299–328.
- Woelkerling, W.J., G. Sartoni and S. Boddi. 2002. *Paulsilvella huveorum* gen. et sp. nov. (Corallinaceae, Rhodophyta) from the Holocene of Somalia and Kenya, with a reassessment of *Lithothrix antiqua* from the Late Pleistocene of Mauritius. *Phycologia* 41: 358–373.
- Woelkerling W.J., A.J.K. Millar, A. Harvey and M. Baba. 2008. Recognition of *Pachyarthron* and *Bossiella* as distinct genera in the Corallinaceae, subfamily Corallinoideae (Corallinales, Rhodophyta). *Phycologia* 47: 265–293.
- Womersley, H.B.S. 1996. *The marine benthic flora of southern Australia. Part IIIB: Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Australian Biological Resources Study and the State Herbarium of South Australia, Canberra and Adelaide. pp. 392.
- Wynne, M.J. 2008. The status of the name *Alysium holtingii* C. Agardh, a red alga described from Brazil, and a depiction of the type specimen. *Anais Acad. Brasil. Ciênc.* 80: 323–327.
- Yamada, Y. 1944. Notes on some Japanese algae. X. *Sci. Pap. Inst. Algol. Res., Fac. Sci., Hokk. Imp. Univ.* 3: 11–25.
- Yokoyama, A., J.L. Scott, G.C. Zuccarello, M. Kajikawa, Y. Hara and J.A. West. 2009. *Corynoplastis japonica* gen. et sp. nov. and *Dixonellalaea* ord. nov. (Rhodellophyceae Rhodophyta) based on morphological and molecular evidence. *Phycol. Res.* 57: 278–289.
- Yoon, H.S., K.M. Müller, R.G. Sheath, F.D. Ott and D. Bhattacharya. 2006. Defining the major lineages of red algae (Rhodophyceae). *J. Phycol.* 42: 482–492.
- Zuccarello, G.C. 2008. A fungal gall of *Catenella nipae* (Caulacanthaceae, Rhodophyta) and a review of *Catenellocolax leeuwenii*. *Bot. Mar.* 51: 436–440.
- Zuccarello, G.C. and J.A. West. 2008. *Bostrychia* (Rhodomelaceae, Rhodophyta) species of New Zealand, and relationships in the Southern Hemisphere. *N. Z. J. Mar. Freshw. Res.* 42: 315–324.
- Zuccarello, G.C., J.A. West and N. Kikuchi. 2008. Phylogenetic relationships within the Stylonematales (Stylonematophyceae, Rhodophyta): biogeographic patterns do not apply to *Stylonema alsidii*. *J. Phycol.* 44: 384–393.
- Zuccarello, G., N. Kikuchi and J.A. West. 2010. Molecular phylogeny of the crustose members of the Erythropeltiales (Compsopogonophyceae, Rhodophyta): new genera *Pseudoerythrocladia* and *Madagascarica* and the evolution of the upright habit. *J. Phycol.* 46: 363–373.

Received 18 March, 2010; accepted 11 May, 2010