

A Baseline Summary and Analysis of the Taxonomic Biodiversity of Coralline Red Algae (Corallinales, Rhodophyta) Recorded from the New Zealand Region

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Abstract — A baseline summary and analysis of taxonomic information on coralline red algae (Corallinales, Rhodophyta) for the New Zealand region (including island groups currently under New Zealand jurisdiction) is provided. Of the 80 species and infraspecific taxa recorded, twenty-nine are based on New Zealand types, but the status of 20 of these 29 is uncertain because the types have not been re-examined in a modern context. Approximately half of the taxa based on types from elsewhere are known to be distinct species in a modern context, but the occurrence of most of these in the New Zealand region requires confirmation. For each taxon reported from the New Zealand region, published records are summarised, and information on the type and type locality are provided along with pertinent comments and nomenclatural notes. There are no modern monographic studies of New Zealand Corallinales; the true species biodiversity for the region remains unknown; and in most cases, it is not possible at present to identify New Zealand region specimens to species level using past publications for the region.

catalogue of taxa / Chatham Islands / Corallinales, Rhodophyta / coralline red algae / New Zealand region / southern Australia / species biodiversity / Subantarctic / taxonomy

Résumé — Liste de référence et analyse de la biodiversité taxinomique des algues rouges Corallinacées (Corallinales, Rhodophyta) signalées dans la région de Nouvelle-Zélande. Une liste de référence et l'analyse de l'information taxinomique des algues rouges Corallinacées (Corallinales, Rhodophyta) de la région de Nouvelle Zélande (y compris les groupes d'îles sous la juridiction actuellement de la Nouvelle-Zélande) sont données. Des 80 espèces et taxons infraspécifiques, 29 sont basés sur des types de Nouvelle-Zélande, mais le statut de 20 de ces 29 espèces est incertain parce que les types n'ont pas été examinés à nouveau dans un contexte moderne. Approximativement, la moitié des taxons basés sur des types dans d'autres régions est reconnue comme étant des espèces distinctes dans un contexte moderne ; la présence de la plupart de ces taxons demande confirmation en Nouvelle-Zélande. Pour chaque taxon signalé dans la région de Nouvelle-Zélande, les citations dans les publications sont regroupées, l'information sur le type et la localité-type est donnée avec des commentaires appropriés et des notes sur la nomenclature. Il n'existe pas

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d'études monographiques modernes sur les Corallinales de Nouvelle-Zélande ; la vraie biodiversité spécifique demeure inconnue pour la région ; actuellement, il n'est pas possible d'identifier les spécimens de la région de Nouvelle-Zélande en utilisant d'anciennes publications de la région.

Algues rouges / Australie du sud / biodiversité des espèces / catalogue of taxa / Chatham Islands / Corallinales, Rhodophyta / région de Nouvelle Zélande / Subantarctique? / taxinomie

INTRODUCTION

Published records of coralline red algae (Corallinales, Rhodophyta) from the New Zealand region began with Lamouroux (1821: 23), who described *Jania crassa* from specimens collected in Dusky Sound (South Island) and received from 'D. Leach' (probably Dr William Elford Leach; see Stearn, 1981: 163). Since then, at least 80 species and infraspecific taxa of Corallinales have been reported from the region. Most records, however, require verification, and many of the taxa require re-evaluation in a modern context.

There are no published monographic studies of New Zealand Corallinales, nor has a baseline summary and analysis of extant information been compiled previously. The floristic account of Chapman & Parkinson (1974: 169-202) contained little original research (Parsons, 1985a: 665), left many points to be clarified, provided no summary of previous information, and is now taxonomically out of date and only of historical interest. In addition, the nomenclature of New Zealand corallines is confused and includes a number of incorrect or superfluous names (Adams, 1994: 156). Nelson *et al.* (2002: 123) concluded that taxonomic knowledge of non-geniculate species remains almost non-existent in Fiordland (the southwest part of the South Island, including Dusky Sound), and despite the fact that these algae dominate rock walls to considerable depths, they are poorly represented in collections of algae in New Zealand. The dearth of accurate taxonomic information for corallines in the Fiordland area is mirrored throughout the New Zealand region (e.g. see Nelson & Adams, 1987: 31; Nelson *et al.*, 1991: 32; Adams, 1994: 160; Neale & Nelson, 1998: 108). Indeed, Nelson (2002) characterised the crustose coralline algae as the least studied of New Zealand's macroalgal flora but potentially one of the most important ecologically.

The present study was undertaken to provide a baseline summary and analysis of existing taxonomic information on the Corallinales for the New Zealand region, thereby establishing a platform from which monographic studies can be initiated. Comparisons of the assembled data with completed monographic studies for southern Australia are included along with comments and/or nomenclatural notes as required.

SCOPE AND FORMAT

The New Zealand region, referred to by Parsons (1985b: 131) and Adams (1994: 13) as the 'New Zealand botanical region', comprises the three main islands (North Island, South Island, Stewart Island) and eight additional off-shore groups

of islands in New Zealand territorial waters (Table 1). Records from the uninhabited Balleny Islands (administered by New Zealand) in the Ross Sea sector of Antarctica also have been included. Macquarie Island, which is under Australian government jurisdiction, was included in the New Zealand botanical region by Parsons (1985b) but not by Adams (1994). It has not been included here; records of Macquarie Island corallines are summarized in Ricker (1987).

The remainder of this account is divided into two parts: 1) a catalogue of taxa; and 2) a summary analysis including comparisons with southern Australia. Within the catalogue, taxa are divided into two easily recognizable morphological groups: geniculate taxa (listed first) and non-geniculate taxa (listed after the geniculate taxa). Geniculate taxa have branches (axes) consisting of alternating uncalcified and calcified segments. Uncalcified segments are termed genicula, while calcified segments are termed intergenicula. Non-geniculate taxa either lack branches altogether or have branches that are calcified throughout (no alternating uncalcified and calcified segments).

No genus of Corallinales currently contains both geniculate and non-geniculate species, but the presence or absence of genicula is not used as a sole diagnostic character for generic separation. Several kinds of genicula have evolved, and the resulting differences have been used, at least in part, to group some genera at higher taxonomic levels (see Johansen, 1969, 1976; Cabioch, 1972; and Woelkerling, 1988).

Table 1. Regions of New Zealand, with abbreviations used in this account in listing published records.

<i>Region</i>	<i>Degrees South Latitude</i>	<i>Abbreviation</i>
'Mainland' New Zealand		
New Zealand (general)		NZ
North Island	34-41	Nor
South Island	40-46	Sou
Stewart Island	46-47	Ste
Temperate/subtropical island groups		
Chatham Islands	43-44	Cha
Kermadec Islands	29-31	Ker
Three Kings Islands	34	Kin
Subantarctic island groups		
Antipodes Islands	49	Ant
Auckland Islands	50	Auc
Balleny Islands	66	Bal
Bounty Islands	47	Bou
Campbell Island	52	Cam
Snares Islands	48	Sna
Unspecified		
Records to New Zealand region types in Adey (1970) not explicitly mentioning a New Zealand region locality		U

The type material of a number of taxa reported from the New Zealand region has not been studied in a modern context; the presence or absence of genicula in these taxa has been inferred from the genus in which the taxon was placed originally. Thus, taxa whose types have not been studied in a modern context but that originally were described as species or infraspecific taxa of *Amphiroa*, *Corallina*, *Cheilosporum* and *Jania* are presumed to possess genicula. By contrast, the type of *Corallina membranacea* Esper has been studied and lacks genicula, and thus is included amongst the non-geniculate listings in the catalogue.

Both geniculate taxa and non-geniculate taxa are listed alphabetically by final epithet. Because the status and disposition of a number of taxa require re-evaluation, and because the generic placement of a number of taxa remains uncertain, it would be premature and potentially misleading to organize the catalogue into a taxonomic framework such as that used in the southern Australian flora (Womersley, 1996) or the update proposed by A. Harvey *et al.* (2003).

For each taxon, the following categories of data are provided, as applicable: basionym; type locality; type; references to published illustrations of type material; published records from the New Zealand region; and comments, including nomenclatural notes. For each taxon, published New Zealand region records are provided in chronological order, first for the basionym, and then for each homotypic synonym. Homotypic synonyms are arranged in chronological order after the basionym, with author citations and publication details provided for each.

For four species (*Corallina palmata*, *C. unguolata*, *Lithothamnion agariciforme*, and *L. fumigatum*), formae but not the type form have been reported in the literature for the New Zealand region. In the catalogue of taxa, these four formae have been cross-referenced with entries for the main species. The main species, however, are not included in Tables 2-5 nor are they taken account of in the Discussion and Summary Analysis following the catalogue.

Family names of authors are written out in full. The author A. Harvey is signified by including the first name initial; the author W.H. Harvey is signified by use of the family name only (i.e., A. Harvey vs Harvey). Nomenclatural notes are based on the *International Code of Botanical Nomenclature (St Louis Code) Adopted by the Sixteenth International Botanical Congress, St Louis, Missouri, July - August 1999* (Greuter *et al.*, 2000), cited in the text using the acronym ICBN. Herbarium abbreviations follow Holmgren *et al.* (1990).

Each published record in the catalogue includes information in square brackets on occurrence in the New Zealand region. Abbreviations for the regions are included in Table 1. Entries in Adey (1970) for species based on New Zealand region types are included even though Adey did not explicitly mention the type locality. In each case, however, Adey (1970) referred solely to the type, and thus it is clear that his entry pertains to New Zealand region material.

By contrast, published records in which occurrences in the New Zealand region cannot be differentiated from records outside the region have been excluded. These include records in Andersson & Athanasiadis (1992), Okamura (1932: 99-106) and in Skottsberg (1941: 77-79). Andersson & Athanasiadis (1992) and Skottsberg (1941) did not differentiate between records from Australia and New Zealand, the latter (Skottsberg 1941: 74) also including various unspecified subantarctic islands. Okamura (1932: 30) included Australia, Lord Howe Island, Norfolk Island and unspecified Antarctic islands in the same group as New Zealand, the Kermadec Islands and the Chatham Islands.

New Zealand region records contained in unpublished theses and mimeographed reports also have been excluded because some involve names that

Table 2. Current status and disposition of taxa of presumed geniculate Corallinales based on New Zealand region types. Author citations for taxa and further data are given in the text.

<i>Epithet</i>	<i>Basionym</i>	<i>Status of type collection</i>	<i>Disposition of taxon</i>
<i>armata</i>	<i>Corallina armata</i>	Lectotype not designated; type material not examined in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>crassa</i>	<i>Jania crassa</i>	Type not examined in detail in a modern context	Status as a distinct species uncertain; sometimes considered a synonym of <i>Jania verrucosa</i>
<i>elegans</i>	<i>Cheilosporum elegans</i>	Type not examined in detail in a modern context	Status as a distinct species uncertain; sometimes considered a synonym of <i>C. sagittatum</i>
<i>hombroonii</i>	<i>Jania hombroonii</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>longiarticulata</i>	<i>Jania novae-zealandiae</i> var. <i>longiarticulata</i>	Lectotype not designated; type not examined in a modern context	Generic placement uncertain; status as a distinct taxon uncertain
<i>novae-zealandiae</i>	<i>Jania novae-zealandiae</i>	Lectotype not designated; type not examined in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>pisillaris</i>	<i>Jania pisillaris</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain

Table 3. Current status and disposition of taxa of non-geniculate Corallinales based on New Zealand region types. Author citations for taxa and further data are given in the text.

<i>Epithet</i>	<i>Basionym</i>	<i>Status of type collection</i>	<i>Disposition of taxon</i>
<i>asperulum</i>	<i>Lithothamnion asperulum</i> f. <i>asperulum</i>	Lectotype studied by Wilks & Woelkerling (1994)	Heterotypic synonym of <i>Mesophyllum engelhartii</i>
<i>aucklandicum</i>	<i>Lithothamnion fumigatum</i> f. <i>aucklandicum</i>	Holotype studied by Woelkerling & Harvey (1993)	Heterotypic synonym of <i>Mesophyllum engelhartii</i>
<i>carpophylli</i>	<i>Melobesia carpophylli</i>	Lectotype not designated; type material not examined in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>caulerpae</i>	<i>Melobesia caulerpae</i>	Lectotype examined by Penrose (1996b)	Heterotypic synonym of <i>Pneophyllum coronatum</i>
<i>chathamense</i>	<i>Lithothamnion chathamense</i>	Holotype studied by Keats & Chamberlain (1997)	Taxon of indeterminate status both at genus and species levels
<i>cladophorae</i>	<i>Schmitziella cladophorae</i>	Neotype studied by Woelkerling & Irvine (1982)	Heterotypic synonym of <i>Melobesia membranacea</i>
<i>cystocarpideum</i>	<i>Lithothamnion cystocarpideum</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>detrusum</i>	<i>Lithophyllum detrusum</i>	Lectotype not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>explanatum</i>	<i>Lithophyllum explanatum</i>	Lectotype not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>geppii</i>	<i>Lithothamnion geppii</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>haptericolum</i>	<i>Lithothamnion haptericolum</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>incisa</i>	<i>Lithothamnion patena</i> f. <i>incisa</i>	Lectotype studied by Woelkerling & Harvey (1992, 1993) and by Keats & Maneveldt (1997)	Considered to be a distinct species of <i>Mesophyllum</i>
<i>insigne</i>	<i>Lithothamnion insigne</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>jugatum</i>	<i>Lithophyllum jugatum</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>leptura</i>	<i>Melobesia leptura</i>	Lectotype studied by Woelkerling (1997)	Heterotypic synonym of <i>Pneophyllum fragile</i>
<i>monostromaticum</i>	<i>Lithothamnion monostromaticum</i>	Type not examined in detail in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>novae-zeelandiae</i>	<i>Lithothamnion novae-zeelandiae</i>	Lectotype not designated; type not examined in a modern context	Generic placement uncertain; status as a distinct species uncertain
<i>novae-zeelandiae</i>	<i>Melobesia novae-zeelandiae</i>	Original material probably destroyed; neotype not designated	Generic placement uncertain; status as a distinct species uncertain
<i>patena</i>	<i>Melobesia patena</i>	Lectotype studied by Townsend (1979) and by May & Woelkerling (1988)	Considered to be a distinct species of <i>Synarthrophyton</i>
<i>rhizomae</i>	<i>Lithophyllum rhizomae</i>	Original material probably destroyed; neotype not designated	Generic placement uncertain; status as a distinct species uncertain
<i>schielanum</i>	<i>Synarthrophyton schielanum</i>	Holotype studied by Woelkerling & Foster (1989)	Considered to be a distinct species of <i>Synarthrophyton</i>
<i>tuberculatum</i>	<i>Lithophyllum tuberculatum</i>	Lectotype not designated; type not examined in a modern context	Generic placement uncertain; status as a distinct species uncertain

Table 4. Current status and disposition of taxa of geniculate Corallinales reported from the New Zealand region but based on types from localities elsewhere. Author citations for taxa and further data are given in the text.

<i>Epithet</i>	<i>Basionym</i>	<i>Status of type collection</i>	<i>Disposition of taxon</i>	<i>Status of NZ region record(s)</i>
<i>affinis</i>	<i>Jania affinis</i>	Lectotypification unclear; type material examined by Johansen & Womersley (1994)	Considered to be a distinct species of <i>Jania</i> ; epithet <i>affinis</i> has priority over <i>pulchella</i> (see text)	Single record requires verification
<i>arceps</i>	<i>Corallina arceps</i>	Mentioned by Womersley & Johansen (1996a) but detailed account lacking	Considered a distinct species of <i>Amphiroa</i>	Records require re-assessment once type has been studied
<i>australis</i>	<i>Corallina virgata</i> var. <i>australis</i>	Seen but not examined in detail by Garbary & Johansen (1982); requires further detailed study in a modern context	Transferred into <i>Halipilton</i> by Garbary & Johansen (1982); status as distinct taxon requires further study	Single record requires re-assessment
<i>berteroi</i>	<i>Corallina berteroi</i>	Type not examined in detail in a modern context	Requires re-assessment once type has been studied	Records require re-assessment once type has been studied
<i>bowbankii</i>	<i>Amphiroa bowbankii</i>	Type not examined in detail in a modern context	Requires re-assessment once type has been studied	Single record needs verification once type has been studied
<i>brevior</i>	<i>Corallina unguolata</i> f. <i>brevior</i>	Lectotyped with illustrations (Moura & Yamaguchi-Tomita 1998)	Considered a distinct variety of <i>Jania unguolata</i>	Records require re-assessment
<i>corymbosa</i>	<i>Corallina corymbosa</i>	Type not examined in detail in a modern context	Requires re-assessment once type has been studied	Records require re-assessment once type has been studied
<i>crispata</i>	<i>Corallina crispata</i>	Examined by Johansen & Womersley (1986)	Heterotypic synonym of <i>Halipilton roseum</i>	Single record of <i>crispata</i> requires re-assessment
<i>cuvieri</i>	<i>Corallina cuvieri</i>	Examined by Johansen & Womersley (1986)	Heterotypic synonym of <i>Halipilton roseum</i>	Records of <i>cuvieri</i> require re-assessment
<i>filicula</i>	<i>Corallina filicula</i>	Type not examined in detail in a modern context	Johansen (in Seagrief 1984) places in <i>Arthrocardia</i> , but requires re-assessment once type has been studied	Records require re-assessment once type has been studied
<i>gracilis</i>	<i>Corallina gracilis</i>	Examined by Johansen & Womersley (1986)	Heterotypic synonym of <i>Halipilton roseum</i>	Records of <i>gracilis</i> require re-assessment
<i>granifera</i>	<i>Corallina granifera</i>	Whereabouts unknown	Requires re-assessment once type or designated neotype has been studied	Records require re-assessment once type has been studied
<i>lycopodioides</i>	<i>Corallina gracilis</i> var. <i>lycopodioides</i>	Type not examined in detail in a modern context	Requires re-assessment once type has been studied	Single record requires re-assessment

Table 4. (cont.) Current status and disposition of taxa of geniculate Corallinales reported from the New Zealand region but based on types from localities elsewhere. Author citations for taxa and further data are given in the text.

<i>Epithet</i>	<i>Basionym</i>	<i>Status of type collection</i>	<i>Disposition of taxon</i>	<i>Status of NZ region record(s)</i>
<i>micrarthrodia</i>	<i>Jania micrarthrodia</i>	Examined by Johansen & Womersley (1994)	Considered a distinct species of <i>Jania</i>	Vouchers specified for a number of published records
<i>natalensis</i>	<i>Jania natalensis</i>	Published account of type material lacking	Possible heterotypic synonym of <i>J. crassa</i>	NZ records require re-assessment once type has been studied
<i>officinalis</i>	<i>Corallina officinalis</i>	Seen but not examined in detail by Irvine & Johansen (1994)	Considered a distinct species of <i>Corallina</i>	Vouchers specified for a number of published records
<i>pedunculata</i>	<i>Jania pedunculata</i>	Type not examined in detail in a modern context	Treated as a synonym of <i>J. verrucosa</i> but requires re-assessment once type has been studied	Records require re-assessment once type has been studied
<i>pilifera</i>	<i>Corallina pilifera</i>	Examined by Johansen & Womersley (1986)	Heterotypic synonym of <i>Halipitlon roseum</i>	Records of <i>pilifera</i> require re-assessment
<i>pilulifera</i>	<i>Corallina pilulifera</i>	Lectotype not designated; type material not examined in a modern context	Requires re-assessment once type has been studied	Records require re-assessment once type has been studied
<i>rosea</i>	<i>Corallina rosea</i>	Examined by Johansen & Womersley (1986)	Considered a distinct species of <i>Halipitlon</i>	Vouchers specified for a number of published records
<i>rubens</i>	<i>Corallina rubens</i>	Lectotype selected and studied by Irvine (in Irvine & Johansen 1994: 56)	Considered a distinct species of <i>Jania</i>	NZ records require re-assessment
<i>sagittata</i>	<i>Corallina sagittata</i>	Examined by Johansen (1977)	Considered a distinct species of <i>Chelosporeum</i>	Vouchers specified for most published records
<i>tribulus</i>	<i>Corallina tribulus</i>	Whereabouts uncertain	Commonly considered a distinct species of <i>Amphiroa</i> but requires re-assessment once type has been studied	Single record requires re-assessment
<i>verrucosa</i>	<i>Jania verrucosa</i>	Type not examined in detail in a modern context	Commonly considered a distinct species of <i>Jania</i> but requires re-assessment	Records require re-assessment once type has been studied
<i>virgata</i>	<i>Corallina virgata</i>	Seen but not examined in detail by Garbary & Johansen (1982); requires further detailed study in a modern context	Transferred into <i>Halipitlon</i> by Garbary & Johansen (1982); status as distinct taxon requires further study	Single record requires re-assessment
<i>wardii</i>	<i>Amphiroa wardii</i>	Examined by Womersley & Johansen (1988)	Considered a distinct species of <i>Arthrocardia</i>	Vouchers specified for some records; other require verification

Table 5. Current status and disposition of taxa at some stage considered to be non-geniculate Corallinales and reported from the New Zealand region but based on types from localities elsewhere. Author citations for taxa and further data are given in the text.

Epithet	Basionym	Status of type collection	Disposition of taxon	Status of NZ region record(s)
<i>amplexifrons</i>	<i>Melobesia amplexifrons</i>	Examined by Chamberlain & Norris (1994)	Considered a distinct species of <i>Pneophyllum</i>	All records require re-assessment
<i>antarcticum</i>	<i>Melobesia verrucata</i> var. <i>antarctica</i>	Examined by May & Woelkerling (1988)	Heterotypic synonym of <i>Synarthrophyton patena</i>	All records of <i>antarctica</i> require re-assessment
<i>calcareum</i>	<i>Millepora calcarea</i>	Neotype examined by Woelkerling & Irvine	Considered a distinct species of <i>Phymatolithon</i>	All records require re-assessment
<i>capense</i>	<i>Lithophyllum capense</i>	Examined by Chamberlain (2000)	Considered a distinct species of <i>Mesophyllum</i>	Single record requires re-assessment
<i>corallinae</i>	<i>Melobesia corallinae</i>	Examined by Chamberlain (1991) and by Woelkerling & Campbell (1992)	Considered a distinct species of <i>Lithophyllum</i>	All records require re-assessment
<i>coronata</i>	<i>Melobesia coronata</i>	Examined by Penrose (1996b)	Considered a distinct species of <i>Pneophyllum</i>	Confirmed to occur but many records require re-assessment
<i>decumbens</i>	<i>Lithophyllum decussatum</i> f. <i>decumbens</i>	Apparently not examined in detail in a modern context	Requires re-assessment once type has been studied	Single NZ region record based on an error and thus spurious
<i>decussata</i>	<i>Millepora decussata</i>	Whereabouts uncertain	Presumed to be a distinct species of <i>Lithophyllum</i> but requires re-assessment	Records require re-assessment once type once type or designated neotype has been studied
<i>endophloea</i>	<i>Schmitziella endophloea</i>	Examined by Woelkerling & Irvine (1982)	Species excluded from Corallinales	NZ record pertains to <i>Melobesia membranacea</i>
<i>engelhartii</i>	<i>Lithothamnion engelhartii</i>	Examined by Woelkerling & Harvey (1993) and by Chamberlain & Keats (1995)	Considered a distinct species of <i>Mesophyllum</i>	Confirmed to occur; see text comments on heterotypic synonyms
<i>farinosa</i>	<i>Melobesia farinosa</i>	Examined by Chamberlain (1983) and by Chamberlain & Penrose (1993)	Considered a distinct species of <i>Hydrolithon</i>	All records require re-assessment
<i>foecundum</i>	<i>Lithothamnion foecundum</i>	Examined by Chamberlain (1990), Düwel & Weegeberg (1996) and Alongi <i>et al.</i> (2002)	Considered a distinct species of <i>Phymatolithon</i>	Records presumed to be correct but voucher material missing
<i>fragile</i>	<i>Pneophyllum fragile</i>	Examined by Chamberlain (1983) and by Penrose & Woelkerling (1991)	Considered a distinct species of <i>Pneophyllum</i>	Confirmed to occur; see text comment on heterotypic synonym

Table 5. (cont.) Current status and disposition of taxa at some stage considered to be non-geniculate Corallinales and reported from the New Zealand region but based on types from localities elsewhere. Author citations for taxa and further data are given in the text.

<i>Epithet</i>	<i>Basionym</i>	<i>Status of type collection</i>	<i>Disposition of taxon</i>	<i>Status of NZ region record(s)</i>
<i>kotschyannum</i>	<i>Lithophyllum kotschyannum</i>	Type not examined in detail in a modern context	Requires re-assessment once type has been studied	Single record requires re-assessment
<i>melobesioides</i>	<i>Mastophora melobesioides</i>	Examined by Turner & Woelkerling (1982a, 1982b)	Considered a distinct species of <i>Lithoporella</i>	Single record requires confirmation
<i>membranacea</i>	<i>Corallina membranacea</i>	Examined by Chamberlain (1985) and by Wilks & Woelkerling (1991)	Considered a distinct species of <i>Melobesia</i>	Confirmed to occur but some records require re-assessment
<i>mesomorphum</i>	<i>Lithohamnion mesomorphum</i>	Examined by Chamberlain and reported in Athanasiadis (1999)	Considered a distinct species of <i>Mesophyllum</i>	Single record requires re-assessment
<i>muelleri</i>	<i>Lithohamnion muelleri</i>	Examined by Wilks & Woelkerling (1995)	Considered a distinct species of <i>Lithohamnion</i>	Records require re-assessment
<i>pustulatum</i>	<i>Melobesia pustulata</i>	Examined by Woelkerling <i>et al.</i> (1985)	Treated here as a distinct species of <i>Lithophyllum</i> but by some authors referred to <i>Titanoderma</i>	Single record requires verification
<i>repandum</i>	<i>Lithohamnion repandum</i>	Examined by Wilks & Woelkerling (1994)	Considered a distinct species of <i>Phymatolithon</i>	Confirmed to occur; see text comment on heterotypic synonym
<i>thuretii</i>	<i>Melobesia thuretii</i>	Examined by Woelkerling (1987)	Considered a distinct species of <i>Chorozonema</i>	Most records require confirmation
<i>umbonata</i>	<i>Lithohamnion engelhartii</i> f. <i>umbonata</i>	Examined by Woelkerling & Harvey (1993)	Heterotypic synonym of <i>Mesophyllum engelhartii</i> f. <i>engelhartii</i>	<i>M. engelhartii</i> f. <i>engelhartii</i> confirmed to occur
<i>verrucata</i>	<i>Melobesia verrucata</i>	Examined by Chamberlain (1986)	Heterotypic synonym of <i>Lithophyllum pustulatum</i>	Single record (as <i>Melobesia verrucata</i>) requires re-assessment

are not effectively published in the context of the ICBN. The most pertinent of these is a 1977 thesis by K.A. Johnson entitled *Studies on some Crustose Coralline Algae of New Zealand, and Aspects of the Systematics of the Family Corallinaceae*, undertaken at the University of Auckland. Johnson's specimens are lodged at AK and will require re-examination in the context of monographic studies. A 1974 mimeographed report by G.D. Fenwick entitled *Crustose coralline algae collections, Kaikoura region, 1973 – 1974*, cited by South & Adams (1976: 64), does not mention any species by name.

Taxonomic data pertinent to the coralline red algae of the New Zealand region were found in 314 publications during the present study.

CATALOGUE OF TAXA

Geniculate corallines

affinis

Basionym. *Jania affinis* Harvey, 1855b: 547.

Type locality. Rottneest Island, Western Australia.

Type. See comments.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Jania affinis* Harvey — Tittley *et al.*, 1984: 63 [NZ].

Comments. According to Johansen & Womersley (1994: 619, 623) the type of *Jania affinis* is conspecific with *Jania pulchella* (Harvey) Johansen & Womersley, which they had transferred into *Jania* in the same paper. The basionym of the latter (*Cheilosporum pulchellum* Harvey, 1855b: 547), however, has equal priority with *Jania affinis* (described in the same paper), and according to Silva *et al.* (1996: 241), Johansen & Womersley should have adopted the name *Jania affinis* (dating from 1855) rather than proposing and adopting a new combination, *J. pulchella* (dating from 1994).

Johansen & Womersley (1994) did not indicate which type material of *Jania affinis* they examined or where it was housed. Harvey (1855b: 547) did not specify a type in the protologue, but subsequently (Harvey, 1863: xxix) cited specimen 449 in his exsiccata of Australian algae (see Sayre, 1969: 77 for details), which was distributed to a number of herbaria. Tittley *et al.* (1984: 7) list specimen 449 in BM as type material without specifying the nature of the type. Thus it is unclear whether a lectotype has been formally designated or where it is housed.

In addition to the New Zealand region, *Jania affinis* has been reported from Australia and Sri Lanka (Silva *et al.*, 1996: 241).

anceps

Basionym. *Corallina anceps* Lamarck, 1815: 238.

Type locality. "... les mers Australes ou de la Nouvelle-Hollande. Péron *et Lesueur*." (Lamarck, 1815: 239).

Type. PC.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Amphiroa anceps* (Lamarck) Decaisne, 1842b: 125. — Gepp & Gepp, 1911: 23 [Ker]. Chapman & Parkinson, 1974: 172, pl. 55B [Ker]. Nelson & Adams, 1984: 17 [Ker]. Adams & Nelson, 1985: 17 [Kin]. Nelson & Adams, 1987: 30 [Nor]. Adams, 1994: 160, pl. 55 (upper left) [Ker, Kin, Nor, Sou]. Nelson *et al.*, 2002: 137 [Sou].

Comments. The type apparently has not been examined in detail in a modern context. Womersley & Johansen (1996a: 285, fig. 130), however, recognized *Amphiroa anceps* as a distinct species, indicated that the type is in PC, and provided an account of the species in southern Australia. Other accounts include those of Weber - van Bosse (1904: 93, pl. 16, figs 6-8) (Indonesia), Ganesan (1968: 7, figs 1, 2, 5-7, 12-20, pl. 1 figs 3, 4) (India) and Millar (1990: 315, figs 9A-H (eastern Australia)).

According to Womersley & Johansen (1996a: 286), *A. anceps* is widespread in the Indo-Pacific; Indian Ocean records are summarized by Silva *et al.* (1996: 219-220).

armata

Basionym. *Corallina armata* Hooker *et* Harvey, in Harvey 1849: 103, pl. 40 (lower right).

Type locality. New Zealand.

Syntype material. TCD, Colenso numbers 224 and 654.

Published illustrations of syntype material. Harvey, 1849: pl. 40 (lower right). Chapman & Parkinson, 1974: pl. 60A.

Published records from the New Zealand region. *Corallina armata* Hooker *et* Harvey. — Harvey, 1849: 103, pl. 40 (lower right) [NZ]. Areschoug, 1852: 566 [NZ]. Harvey, 1855a: 237 [NZ]. Harvey, 1867: 679 [NZ]. Laing, 1896: 33 [Sou]. Laing, 1902: 357 [NZ, Sou]. De Toni, 1905: 1843 [NZ]. Cotton, 1907: 43 [Cha, NZ]. Laing, 1916: 38 [Sou]. Laing, 1926: 181 [Cha, NZ]. Laing, 1932: 41 [Sou]. Naylor, 1954: 655 [Sou]. Chapman & Parkinson, 1974: 179, pl. 60A [Cha, Sou]. Tittley *et al.*, 1984: 63 [NZ]. Nelson & Adams, 1987: 30 [Nor]. Nelson *et al.*, 1991: 31. [Cha]. Adams, 1994: 157 [Nor].

Comments. In the protologue of *Corallina armata*, Harvey (1849: 103) cited two Colenso specimens obtained from Hooker but did not designate a type. A lectotype apparently has not been designated, and the TCD syntype material apparently has not been studied in detail in a modern context. Thus the status and disposition of this species are uncertain. The nature of possible type material in BM (Tittley *et al.*, 1984: 6) requires further investigation, and all New Zealand records require verification once detailed information on a designated lectotype is available.

Corallina armata also has been reported from Tierra del Fuego (Fuegia) and subantarctic South America (e.g. Hariot, 1891: 420; Hariot, 1892: 1433; Gain, 1912: 125; Papenfuss, 1964: 28; Chapman & Parkinson, 1974: 179; Ramírez & Santelices, 1991: 201). Mendoza (1999: 141), however, stated that the species does not occur in Tierra del Fuego.

australis

Basionym. *Corallina virgata* var. *australis* Grunow, 1873: 42 (p. 20 in independently paginated offprint).

Type locality. Port Denison, Queensland, Australia.

Type. Possibly in W (requires confirmation).

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Corallina granifera* var. *australis* (Grunow) Grunow ex De Toni, 1905: 1846. — Laing, 1926: 181 [Ant, NZ].

Comments. Based on an examination of the thallus surface of a fragment of the type, Garbary & Johansen (1982) transferred the variety (and the species) to *Haliptilon* [i.e. *Haliptilon virgatum* (Zanardini) Garbary & Johansen) var. *australe* (Grunow) Garbary & Johansen]. This needs to be confirmed from a more detailed study of the type to determine whether it belongs to the genus *Haliptilon* (see Womersley & Johansen 1996b) and to the species *virgatum* (see separate entry below).

The New Zealand record of Laing (1926) requires verification; the record appears to be linked to remarks under *Jania affinis* in De Toni & Forti (1922: 63). The variety also has been recorded from the west coast of Australia (De Toni & Forti, 1922: 62; Silva *et al.*, 1996: 235).

berteroi

Basionym. *Corallina berteroi* Montagne ex Kützing, 1849: 709 (as *berterii*).

Type locality. Chile (precise locality not given).

Holotype. L 940.284-98 (unpublished data based on a personal communication from W.F. Prud'homme van Reine).

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Corallina berteroi* Montagne ex Kützing. — Levring, 1945: 16 [Cam]. Papenfuss, 1964: 28 [Cam]. Chapman & Parkinson, 1974: 179, pl. 61A [Cam]. Hay *et al.*, 1985: 37 [Cam]. Millar, 1990: 317, figs 10A – 10C [Cam].

Comments. The type apparently has not been studied in detail in a modern context. Millar (1990: 317-318, figs 10A – 10C), however, recognized *Corallina berteroi* (as *berteri*) as a distinct species occurring in Australia. Information on the orthography of the specific epithet was given by Silva *et al.* (1996: 231), who also noted that the species was twice described independently, first in Kützing (1849: 709) and then in Harvey (1849: 103).

All Campbell Island records need to be confirmed once the type has been examined. According to Millar (1990: 318), the species also has been recorded from Australia, Chile, California, and the Philippines, while Littler & Littler (2003) stated the species occurs in the tropical Pacific, Australia, the Indian Ocean and the eastern Atlantic. Indian Ocean records are given by Silva *et al.* (1996: 231).

bowerbankii

Basionym. *Amphiroa bowerbankii* Harvey, 1849: 97, pl. 37 (upper half).

Type locality. Algoa Bay, Cape of Good Hope, South Africa.

Lectotype. TCD, # 25; designated by Millar (1990: 316).

Published illustrations of type material. Apparently none. It is unclear whether Harvey's illustrations are based on the designated lectotype.

Published records from the New Zealand region. *Amphiroa bowerbankii* Harvey. — Tittley *et al.*, 1984: 63 [NZ].

Comments. The lectotype has not been studied in detail in a modern context. Millar (1990: 317) provisionally treated *A. bowerbankii* as a heterotypic synonym of *A. anceps* pending comparative studies of both types and further collections.

The New Zealand material upon which the record of Tittley *et al.* (1984) is based requires re-assessment. Elsewhere, Silva *et al.* (1996: 221), who retained the name *Amphiroa bowerbankii*, listed records from South Africa, Madagascar, Sri Lanka, and Indonesia.

brevior

Basionym. *Corallina ungulata* f. *brevior* Yendo, 1902a: 27, pl. 3, fig. 9, pl. 7, fig. 9.

Type locality. Province of Boshu, Japan.

Lectotype. Yendo, 1902a: 27, pl. 3, fig. 9, pl. 7, fig. 9; figures designated by Moura & Yamaguishi-Tomita, 1998: 146.

Published illustrations of type material. Yendo, 1902a: pl. 3, fig. 9, pl. 7, fig. 9.

Published records from the New Zealand region. *Jania ungulata* f. *brevior* (Yendo) Yendo, 1905: 38. — Nelson & Adams, 1984: 17 [Ker]. Adams, 1994: 158 [Ker].

Comments. According to Baba *et al.* (1988: 21), the types of geniculate corallines described by Yendo cannot be found. Consequently, Moura & Yamaguishi-Tomita (1998: 146) designated the specimens illustrated in the protologue to serve as lectotype, and they provided a detailed account of Brazilian collections they assigned to this taxon. Specimens upon which New Zealand region records are based require re-examination to determine their status and disposition.

In addition to Brazil (Moura & Yamaguishi-Tomita 1998: 149), *Jania ungulata* f. *brevior* has been reported from Columbia, the Galapagos, Japan, Vietnam, Tanzania and Mauritius (Ballesteros & Afonso-Carillo 1995: 206); Indian Ocean records are listed by Silva *et al.* (1996: 245).

corymbosa

Basionym. *Corallina corymbosa* Lamarck, 1815: 234.

Type locality. "... les mers d'Amérique" (Lamarck, 1815: 235).

Type. PC.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Arthrocardia corymbosa* (Lamarck) Decaisne, 1842a: 380. — Hemsley, 1885: 182 [NZ]. Reinbold, 1899b: 299 [Cha, NZ]. Laing, 1902: 357 [Cha, Nor, NZ]. Laing, 1916: 38 [Sou]. Adams, 1972: 75 [Nor]. Adams *et al.*, 1974: 219 [Ste]. Chapman & Parkinson, 1974: 175, pl. 57A [Cha, Nor, Sou]. South & Adams, 1976: 40. [Sou]. Tittley *et al.*, 1984: 62, 63 [Cha, NZ]. Hay *et al.*, 1985: 37 [Ant, Cam, Sna]. Nelson & Adams, 1987: 30 [Nor]. Nelson *et al.*, 1991: 31. [Cha]. Nelson *et al.*, 1992: 41 [Sou]. Adams, 1994: 159, pl. 55 (centre left) [Ant, Auc, Cam, Cha, Nor, Sna, Sou, Ste]. Neale & Nelson, 1998: 108 [Sou]. Miller *et al.*, 2000: 11 [Nor]. Nelson *et al.*, 2002: 137 [Sou].

Amphiroa corymbosa (Lamarck) Decaisne, 1842b: 124. — Harvey, 1849: 99 [NZ]. Harvey, 1855a: 237 [Nor, & Parimahu (unidentifiable locality)]. Harvey, 1867: 679 [Nor]. Mueller, 1874: 209 (author cited as Harvey) [Cha]. Laing, 1896: 33 [Sou]. Oliver, 1923: 507 [Nor].

Cheilosporum corymbosum (Lamarck) De Toni, 1905: 1826. — Lemmermann, 1907: 381 [Cha, NZ]. Cotton, 1912: 262 [Nor]. Dellow, 1955: 79 [Nor].

Comments. The type has not been studied in detail in a modern context, and thus the status and disposition of this taxon are uncertain. Stegenga *et al.*

(1997: 578, pl. 247, fig. 1) recognized *Arthrocardia corymbosa* as a distinct species in South Africa and provided a brief description, but commented that their identification was tentative.

Lamarck (1815: 235) gave the type locality as "... les mers d'Amérique", but Johansen (1969: 57) suggested that the probable type locality is the Cape of Good Hope.

Outside the New Zealand region, the species has been reported from Australia (Chapman & Parkinson, 1974: 175), South Africa (Silva *et al.*, 1996: 226; Stegenga *et al.*, 1997: 580) and the American seas Lamarck (1815: 235). Most records require confirmation.

crassa

Basionym. *Jania crassa* Lamouroux, 1821: 23, pl. 69, figs 9, 10.

Type locality. Dusky Sound, South Island, New Zealand (Lamouroux, 1821: 23, as Dusky Bay).

Holotype. CN, Lamouroux herbarium, filed under *Jania* in folder c8-f74.

Published illustrations of holotype material. Lamouroux, 1821: pl. 69, figs 9, 10.

Published records from the New Zealand region. *Jania crassa* Lamouroux. — Lamouroux, 1821: 23 [Sou]. Tittley *et al.*, 1984: 63 [NZ]. Adams, 1994: 157 [Nor, Sou, Ste]. Tseng, 1984: 90, pl. 48, fig. 3 [NZ]. Millar, 1990: 322, figs 11C, 11D [NZ]. Ramírez & Santelices, 1991: 207 [NZ]. Millar & Kraft, 1993: 13 [NZ]. Stegenga *et al.*, 1997: 585, pl. 250, figs 1, 2 [NZ].

Comments. Johansen & Womersley (1994: 616) and Womersley & Johansen (1996b: 305) listed *Jania crassa* as a heterotypic synonym of *J. verrucosa* (see separate entry below), stating that they are almost certainly conspecific (Johansen & Womersley, 1994: 617), at least in southern Australia (Womersley & Johansen, 1996b: 307). The proposed conspecificity, however, needs to be confirmed through a comparative study of both types. Stegenga *et al.* (1997: 585-586) maintained the two as distinct species. Millar & Kraft (1993: 13) used the name *Jania crassa* for eastern Australian specimens, but Womersley & Johansen (1996b: 305) listed the Millar & Kraft (1993) reference in the synonymy of *J. verrucosa*.

According to Adams (1994: 158), New Zealand records of *Jania natalensis* (see separate entry below) pertain to misidentified plants of *J. crassa*. By contrast, Chapman & Parkinson (1974: 176) listed *J. crassa* as a heterotypic synonym of *J. micrarthrodia* (see separate entry below) without explanation.

Outside the New Zealand region, *Jania crassa* has been reported by Skelton & South (2002: 140) from Samoa and by Stegenga *et al.* (1997: 585) from the tropical and subtropical eastern Pacific, tropical west Africa, the Azores, and South Africa. Records for southern and eastern Australia are summarized in Womersley & Johansen (1996b: 305) under *Jania verrucosa*.

crispata

Basionym. *Corallina crispata* Lamouroux, 1816: 289, pl. 10, fig. 3.

Type locality. 'Australasie' (Lamouroux, 1816: 289).

Type. CN, Lamouroux herbarium.

Published illustrations of type material. Lamouroux, 1816: pl. 10, fig. 3; Anonymous, 1824: pl. 10, fig. 3.

Published records from the New Zealand region. *Corallina cuvierii* f. *crispata* (Lamouroux) Areschoug, 1852: 572. — Harvey, 1863: xxviii [NZ].

Comments. Based on a comparison of relevant types, Johansen & Womersley (1986: 563) concluded that *Corallina crispata* Lamouroux is a heterotypic synonym of *Halitilon roseum*. The New Zealand record of *crispata* requires verification through re-examination of Harvey's specimens.

cuvieri

Basionym. *Corallina cuvieri* Lamouroux, 1816: 287, pl. 9, fig. 8a, B.

Type locality. 'Australasie' (Lamouroux, 1816: 287).

Holotype. CN, Lamouroux herbarium.

Published illustrations of type material. Lamouroux, 1816: pl. 9, fig. 8a, B; Anonymous, 1824: pl. 9, fig. 8a, B; Chapman & Parkinson, 1974: fig. 56 (reproduced from the protologue).

Published records from the New Zealand region. *Corallina cuvieri* Lamouroux. — Harvey, 1863: xxviii [NZ]. Harvey-Gibson, 1893: 162 [Sou]. Reinbold, 1899b: 299 [Cha, NZ]. Reinbold, 1900: 152 [NZ]. Cotton, 1907: 43 [Cha, NZ]. Lemmermann, 1907: 381 [Cha, NZ]. Cotton, 1912: 262, 264 [Ker, Nor]. Gepp & Gepp, 1911: 23 [Ker]. Mazza, 1916-1922: 1235 [NZ]. Mazza, 1918: 90 [NZ]. De Toni & Forti, 1922: 62 [Cha, Ker, NZ]. Laing, 1926: 181 [Cha, Ker, NZ]. Laing, 1932: 41 [Sou]. Cranwell & Moore, 1935: 313 [Nor]. Levring, 1945: 16 [Cam, NZ]. Lucas & Perrin, 1947: 399 [NZ]. Naylor, 1954: 655 [Sou]. Dellow, 1955: 79 [Nor]. Chapman, 1961: 350 [Ker]. Papenfuss, 1964: 28 [Cam]. Adams, 1972: 75 [Nor]. Adams *et al.*, 1974: 219 [Ste].

Jania cuvieri (Lamouroux) Decaisne, 1842b: 123. — Harvey, 1849: 105 [NZ]. Harvey, 1855a: 237 [Sou]. Harvey, 1859: 310 [NZ]. Harvey, 1867: 680 [NZ]. Mueller, 1874: 209 [Cha]. Laing, 1896: 33 [Sou]. Laing, 1902: 357 [Cha, Sou, Ste]. Laing, 1916: 38 [Sou].

Cornicularia cuvieri (Lamouroux) Chapman & Parkinson, 1974: 184. — Chapman & Parkinson, 1974: 184, text fig. 56, pl. 59B [Cam, Cha, Nor, Sou] (combination incorrectly attributed to Manza). South & Adams, 1976: 41 [Sou] (combination incorrectly attributed to Manza). Parsons & Fenwick, 1984: 430 [Sou].

Halitilon cuvieri (Lamouroux) Johansen & Silva, 1978: 417. — Nelson & Adams, 1984: 17 [Ker]. Tittley *et al.*, 1984: 62, 63 [Cha, Ker, NZ]. Adams & Nelson, 1985: 17 [Kin]. Hay *et al.*, 1985: 38 [Cam]. Ramírez & Santelices, 1991: 206 [Cam].

Comments. Based on a comparative examination of the types, Johansen & Womersley (1986: 563) concluded that *Corallina cuvieri* was a heterotypic synonym of *Halitilon roseum* (see separate entry below). Parsons & Fenwick (1984: 430) explained why the combination *Cornicularia cuvieri* must be attributed to Chapman & Parkinson rather than Manza. Hay *et al.* (1985: 38) suggested that all subantarctic collections identified as *Halitilon* might better be placed under *Corallina hombronii* but without examining relevant types. All New Zealand records of *cuvieri* require verification.

elegans

Basionym. *Cheilosporum elegans* Areschoug, 1852: 546. See comments (below) concerning authorship of this name.

Type locality. New Zealand.

Type. TCD, Colenso specimen 630.

Published illustrations of type material. Harvey, 1849: 101, pl. 38 (lower left).

Published records from the New Zealand region. *Cheilosporum elegans* Areschoug. — Areschoug, 1852: 546 [NZ]. Askenasy, 1896: 175 (p. 26 in independently paginated offprint) [NZ]. De Toni, 1905: 1833 [NZ]. Cotton, 1912: 262 [Ker, Nor]. Gepp & Gepp, 1911: 23 [Ker, NZ]. Laing, 1926: 181 [Cha, Ker, NZ]. Laing, 1932: 41 [Sou]. Naylor, 1954: 655 [Sou]. Dellow, 1955: 79 [Nor]. Bergquist, 1960: 90 [Nor]. Chapman, 1961: 350 [Ker]. Adams, 1972: 75 [Nor]. Chapman & Parkinson, 1974: 173, pls 55A, 57B [Cha, Ker, Nor, Sou]. South & Adams, 1976: 40. [Sou]. Tittley *et al.*, 1984: 63 [NZ]. Womersley & Johansen, 1996b: 317 [NZ].

Amphiroa elegans Hooker *et* Harvey, in Harvey, 1849: 101, nom. illeg. (see comments). — Harvey, 1849: 101, pl. 38 (lower left) [NZ]. Harvey, 1855a: 237 [Nor]. Harvey, 1859: 310 [NZ]. Harvey, 1867: 679 [Nor]. Laing, 1902: 357 [Nor]. Laing, 1926: 181 [NZ]. Cranwell & Moore, 1935: 313 [Nor].

Comments. Areschoug (1852: 546) based *Cheilosporum elegans* on specimens originally described by Hooker *et* Harvey (in Harvey, 1849: 101) under the name *Amphiroa elegans* Hooker *et* Harvey. The name *Amphiroa elegans* Hooker *et* Harvey, however, is illegitimate (ICBN Art. 53.1) because it is a later homonym of *Amphiroa elegans* Sonder (1845: 55). By contrast, the name *Cheilosporum elegans* Areschoug is legitimate if treated as a new name (i.e. a nomen novum) under ICBN Art. 58.1, and it is based on the same type as the illegitimate name of Hooker and Harvey. The name *Cheilosporum elegans* has priority from 1852 (not 1849) and in accordance with Art. 58.1, *Ex. 1*, it is to be cited as *C. elegans* Areschoug and not *C. elegans* (Hooker *et* Harvey in Harvey) Areschoug.

Womersley & Johansen (1996b: 315, 317) listed *Cheilosporum elegans* Areschoug (and *Amphiroa elegans* Hooker & Harvey in Harvey, *nom. illeg.*) as heterotypic synonyms of *Cheilosporum sagittatum*, commenting (p. 317) that the two seemed indistinguishable, “certainly for southern Australian specimens”. This conclusion requires confirmation from a comparative study of both types in a modern context. New Zealand records of *C. sagittatum* are listed separately below.

Outside the New Zealand region, the name *Cheilosporum elegans* Areschoug has been used for plants from Australia (Womersley, 1966; Chapman & Parkinson, 1974: 173) and from South Africa (Silva *et al.*, 1996: 229).

Amphiroa elegans Sonder (1845: 55) (non Hooker *et* Harvey) is now considered to be a heterotypic synonym of *Metagoniolithon stelliferum* (Lamarck) Ducker. Additional data and references are provided by Silva *et al.* (1996: 260).

filicula

Basionym. *Corallina filicula* Lamarck, 1815: 234.

Type locality. “l’Océan américain” (Lamarck, 1815: 234).

Type. PC, unnumbered, General Herbarium.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Corallina filicula* Lamarck. — Rabenhorst, 1878: 76 [Auc].

Cheilosporum palmatum var. *filicula* (Lamarck) Yendo, 1902b: 192. — Papenfuss, 1964: 28 [Auc]. Chapman & Parkinson, 1974: 174 [Auc]. Hay *et al.*, 1985: 37 [Auc].

Arthrocardia filicula (Lamarck) Johansen, in Seagrief 1984: 2, 6. — Tittley *et al.*, 1984: 63 [NZ].

Comments. There is no detailed published account of the type, and thus uncertainty surrounds the status and disposition of the species. Johansen (in Seagrief, 1984: 2, 6) transferred the species to *Arthrocardia* without providing fur-

ther comments. Stegenga *et al.* (1997: 580, pl. 249, fig. 1) gave an account of southern African plants identified as *A. filicula* but did not examine the type.

All New Zealand records require re-assessment once the type has been studied in detail. Elsewhere, the species has been recorded from Namibia and South Africa (Stegenga *et al.*, 1997: 580) and “l’Océan américain” (Lamarck, 1815: 234). Silva *et al.* (1996: 226) provided nomenclatural notes.

gracilis

Basionym. *Corallina gracilis* Lamouroux, 1816: 288, pl. 10, fig. 1a, B.

Type locality. ‘Australasie’ (Lamouroux, 1816: 288).

Type. CN, Lamouroux herbarium.

Published illustrations of type material. Lamouroux, 1816: pl. 10, fig. 1a, B; Anonymous, 1824: pl. 10, fig. 1a, B.

Published records from the New Zealand region. *Corallina gracilis* Lamouroux. — Chapman, 1954: 200, 201 [Kin].

Jania gracilis (Lamouroux) Montagne, 1845: 147. — Montagne, 1845: 147 [Sou]. Hooker & Harvey, 1845: 539 (p. 19 in independently paginated offprint) [Sou]. Raoul, 1846: 32 [NZ]. Harvey, 1849: 105 [Sou]. Harvey, 1855a: 237 [Sou]. Harvey, 1867: 681 [Sou].

Cornicularia gracilis (Lamouroux) Chapman *et* Parkinson, 1974: 183. — Chapman & Parkinson, 1974: 183, pl. 62A [Sou] (combination incorrectly attributed to Manza).

Halitilon gracilis (Lamouroux) Johansen, 1971: 243. — Tittley *et al.*, 1984: 63 [NZ] (as *gracile*).

Comments. Based on a comparison of relevant types, Johansen & Womersley (1986: 563) concluded that *Corallina gracilis* Lamouroux was a heterotypic synonym of *Halitilon roseum*. The specimens upon which New Zealand records of *gracilis* (including var. *lycopodioides* – see separate entry below) are based require re-examination to determine their correct identity.

granifera

Basionym. *Corallina granifera* Ellis *et* Solander, 1786: 120, pl. 21, figs c, C.

Type locality. Mediterranean coast of Africa.

Type. Whereabouts uncertain; see comments.

Published illustrations of type material. Ellis & Solander, 1786: pl. 21, figs c, C

Published records from the New Zealand region. *Corallina granifera* Ellis *et* Solander. — Papenfuss, 1964: 28 [Ant]. Hay *et al.*, 1985: 37 [Ant].

Cornicularia granifera (Ellis *et* Solander) Chapman *et* Parkinson, 1974: 186. — Chapman & Parkinson, 1974: 186 [Sub, but see note] [authors incorrectly given as (Decaisne) Ellis & Solander].

Comments. The whereabouts of specimens upon which Ellis & Solander (1786) based *Corallina granifera* is presently unknown. Dixon (1960) was unable to locate the Ellis herbarium and suggested that it should be assumed to be lost. The status and disposition of the species are, therefore, uncertain. Irvine & Johansen (1994: 41, 42) listed *Corallina granifera* as a possible synonym of *C. elongata*, noting that it also had been considered a synonym of *Halitilon virgatum* (Zanardini) Garbary *et* Johansen (e.g. see Babbini & Bressan, 1997: 74).

All New Zealand region reports of *granifera* are linked to Papenfuss (1964: 28) who suggested, without supporting evidence, that the Laing (1909: 525)

record of *Corallina virgata* Zanardini probably was a misidentification of material belonging to *C. granifera*. Laing's material requires re-examination in a modern context to determine its correct identity.

Information on *Corallina granifera* var. *australis* in the New Zealand region is provided separately (see entry above).

hombronii

Basionym. *Jania hombronii* Montagne, 1845: 146.

Type locality. Auckland Islands, New Zealand (more precise locality unknown).

Type. PC.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Jania hombronii* Montagne. — Montagne, 1845: 146 [Auc]. Harvey & Hooker, 1845a: 184 [Auc]. Harvey & Hooker, 1845b: 72 [Auc]. Harvey, 1849: 105 [Auc]. Harvey, 1867: 680 [Auc].

Corallina hombronii (Montagne) Montagne ex Kützing, 1849: 707. — Kützing, 1849: 707 [Auc]. Areschoug, 1852: 574 [Auc]. Montagne, 1856: 429 [Auc]. Rabenhorst, 1878: 76 [Auc]. De Toni, 1905: 1850 [Auc]. Laing, 1909: 524 [Auc]. Gain, 1912: 141 [Auc]. Laing, 1926: 181 [Auc]. Naylor, 1954: 655 [Sou]. Papenfuss, 1964: 29 [Auc]. Chapman & Parkinson, 1974: 178, pl. 59A [Auc, Nor, Sou]. South & Adams, 1976: 41 [Sou]. Garbary & Johansen, 1982: 213 [NZ]. Tittley *et al.*, 1984: 61, 63 [Auc, NZ]. Hay *et al.*, 1985: 37 [Ant, Auc, Bou, Cam, Sna]. Nelson & Phillips, 1996: 558 [Nor].

Comments. All New Zealand region records of *hombronii* require re-assessment once the type has been studied in detail. Hay *et al.* (1985: 38) suggested, without giving reasons, that all subantarctic collections identified as *Haliptilon cuvieri* might better be placed under *Corallina hombronii*. Nelson & Phillips (1996: 558), by contrast, concluded that specimen 37 in Fascicle 2 of Lindauer's *Algae Nova-Zelandicae Exsiccatae* identified as *Corallina hombronii* was *Haliptilon roseum*.

The species apparently has not been reported outside the New Zealand region.

intermedia

NAME. *Jania intermedia*, nomen nudum.

Published records from the New Zealand region. *Jania intermedia*, nom. nud. — De Toni & Levi, 1888: 61 [NZ].

Comments. A New Zealand specimen named *Jania intermedia* is listed amongst collections in the herbarium of Giovanni Zanardini (De Toni & Levi, 1888: 61). However, no author citation, diagnosis or description, or reference to a previous diagnosis or description were given, and none has been found elsewhere. Thus the name has no status in relation to the ICBN (Greuter *et al.*, 2000) but rather is a *nomen nudum*. The Zanardini collection apparently has not been examined in a modern context.

longiarticulata

Basionym. *Jania novae-zelandiae* var. *longiarticulata* Harvey, 1855a: 237.

Type locality. Not specified; see comments.

Type. Not specified; see comments.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Jania novae-zelandiae* var. *longiarticulata* Harvey. — Harvey, 1855a: 237 [Sou]. De Toni, 1905: 1857 [NZ].

Comments. Harvey described *Jania novae-zelandiae* var. *longiarticulata* and *Jania novae-zelandiae* (var. *novae-zelandiae*) (separate entry below) concurrently, citing Lyall specimens from the Banks Peninsula and Colenso specimens from the east coast of New Zealand. Harvey did not specify a type for either taxon, and no modern accounts of Harvey's original material have been published. Consequently the status and disposition of both taxa are uncertain. Chapman & Parkinson (1974: 176-177) listed *Jania novae-zelandiae* as a heterotypic synonym of *J. natalensis* without supporting evidence, but did not mention var. *longiarticulata*.

Jania novae-zelandiae var. *longiarticulata* apparently has not been recorded from outside New Zealand.

lycopodioides

Basionym. *Corallina gracilis* var. *lycopodioides* Taylor, 1945: 200, pl. 63.

Type locality. South Bay, Cerros Island, Baja California, Mexico.

Holotype. MICH, Taylor 34-646B.

Published illustrations of type material. Taylor, 1945: pl. 63.

Published records from the New Zealand region. *Corallina gracilis* var. *lycopodioides* Taylor. — Chapman, 1954: 200 [Kin].

Comments. The type of *Corallina gracilis* var. *lycopodioides* Taylor needs to be re-examined to determine its status and disposition in a modern context. Dawson (1953: 129) transferred var. *lycopodioides* into *Corallina vancouveriensis* [i.e., *C. vancouveriensis* ver. *lycopodioides* (Taylor) Dawson], and Johansen (1976: 407) concurred, interpreting var. *lycopodioides* as one of several ecological variants of *C. vancouveriensis*. Neither author, however, examined the relevant types.

The specimens upon which the sole New Zealand region record of var. *lycopodioides* is based also need to be re-examined to determine their identity in a modern context. *Corallina vancouveriensis* is not otherwise recorded from the New Zealand region.

Outside the New Zealand region, the var. *lycopodioides* is recorded from southern California and the Pacific coast of Baja California, Mexico (Dawson, 1953: 129). González-González *et al.* (1996: 194) list additional Mexican records.

micrarthrodia

Basionym. *Jania micrarthrodia* Lamouroux, 1816: 271, pl. 9, fig. 5a, B.

Type locality. “de l’Australasie” (Lamouroux, 1816: 271).

Type. CN, Lamouroux herbarium.

Published illustrations of type material. Lamouroux, 1816: pl. 9, fig. 5a, B; Anonymus, 1824: pl. 9, fig. 5a, B.

Published records from the New Zealand region. *Jania micrarthrodia* Lamouroux. — Areschoug, 1852: 555 [NZ]. Harvey, 1855a: 237 [Nor, Sou, & Parimahu (unidentifiable locality)]. Harvey, 1863: xxix [NZ]. Harvey, 1867: 680 [Sou]. Harvey-Gibson, 1893: 162 [Sou]. Laing, 1896: 33 [Sou]. Laing, 1902: 357 [Cha, Nor, Sou, Ste]. De Toni, 1905: 1855 [NZ]. Gepp & Gepp, 1905: 341 (p. 5 in independently paginated offprint) [NZ]. Lemmermann, 1907: 381 [Cha, NZ]. Cotton, 1912: 262 [Nor]. Laing, 1916: 38 [Sou]. De Toni & Forti, 1922: 63 [Cha, NZ]. Cranwell & Moore, 1935: 313 [Nor]. Lucas & Perrin, 1947: 397 [NZ]. Dellow, 1955:

79 [Nor]. Adams, 1972: 75 [Nor]. Adams *et al.*, 1974: 219 [Ste]. Chapman & Parkinson, 1974: 175, pl. 58A [Cha, Nor, Sou]. South & Adams, 1976: 42 [Sou]. Garbary & Johansen, 1982: 213 [NZ]. Nelson & Adams, 1984: 17 [Ker]. Parsons & Fenwick, 1984: 430 [Sou]. Tittley *et al.*, 1984: 63 [NZ]. Hay *et al.*, 1985: 38 [Ant]. Nelson *et al.*, 1991: 32 [Cha]. Nelson *et al.*, 1992: 41 [Sou]. Millar & Kraft, 1993: 14 [NZ]. Adams, 1994: 157, pl. 54 (upper right) [Ant, Cha, Ker, Nor, Sou, Ste]. Johansen & Womersley, 1994: 611, figs 6-9, 32-36 [NZ]. Womersley & Johansen, 1996b: 299, fig. 136 [NZ]. Neale & Nelson, 1998: 108 [Sou]. Johansen, 1999: 189, fig. 48B [NZ]. Huisman, 2000: 53, including one unnumbered figure [NZ].

Corallina micrarthrodia (Lamouroux) Reinbold, 1899a: 51. — Reinbold, 1899b: 299 [Cha, NZ]. Laing, 1926: 182 [Cha, NZ]. Laing, 1932: 41 [Sou]. Naylor, 1954: 655 [Sou].

Comments. Johansen & Womersley (1994), who examined the type, provided a detailed account of the species. Nelson & Adams (1984: 17) included the Chapman (1961: 350) record of *Jania rubens* under *Jania micrarthrodia*. The NZ record of Areschoug (1852: 555) was based on the occurrence of *Jania crassa*, which Areschoug listed as a synonym of *J. micrarthrodia*.

In addition to the New Zealand region, *Jania micrarthrodia* has been confirmed to occur along the western, southern and south-eastern coasts of Australia, including Tasmania (Millar & Kraft, 1993: 14; Johansen & Womersley, 1994: 612; Womersley & Johansen, 1996b: 301). Indian Ocean records were summarized by Silva *et al.* (1996: 242-243); most require confirmation. Littler & Littler (2003: 34) also reported the species from the Red Sea and the eastern tropical Atlantic and the tropical and subtropical Pacific.

natalensis

Basionym. *Jania natalensis* Harvey, 1849: 107.

Type locality. Port Natal, South Africa.

Type. TCD (Harvey, 1849: 107).

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Jania natalensis* Harvey. — Chapman & Parkinson, 1974: 176, pl. 58B [Ker, Nor]. South & Adams, 1976: 42 (generic placement with a question mark) [Sou].

Comments. There apparently is no published account of the type material of *Jania natalensis* in a modern context. Based on a personal communication from H.W. Johansen, however, Seagrief (1984: 37) listed *Jania natalensis* as a heterotypic synonym of *J. crassa*. Subsequently, Johansen & Womersley (1994: 616) listed both *J. natalensis* and *J. crassa* (see separate entry for *crassa* above) as heterotypic synonyms of *J. verrucosa* (see separate entry below). These proposed conspecificities require confirmation through a detailed, comparative study of relevant types in a modern context.

According to Adams (1994: 158), New Zealand records of *Jania natalensis* pertain to misidentified plants of *J. crassa*.

novae-zelandiae

Basionym. *Jania novae-zelandiae* Harvey, 1855a: 237.

Type locality. Not specified; see comments.

Type. Not specified; see comments.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Jania novae-zealandiae* Harvey. — Harvey, 1855a: 237 [Sou]. Harvey, 1867: 681 [NZ, Sou]. De Toni, 1905: 1857 [NZ]. Mazza, 1916-1922: 1255 [NZ]. Mazza, 1918: 110 [NZ]. Nelson & Adams, 1987: 30 [Nor]. Nelson *et al.*, 1991: 32 (as *Jania* sp. cf. *J. novae-zealandiae*) [Cha]. Nelson *et al.*, 1992: 41 (as *Jania* sp. cf. *J. novae-zealandiae*) [Sou]. Adams, 1994: 158 [Cha, Nor, Sou].

Comments. The status and disposition of *Jania nova-zealandiae* are uncertain (see comments under *longiarticulata*). Chapman & Parkinson (1974: 176-177) listed *Jania novae-zealandiae* as a heterotypic synonym of *J. natalensis* (see separate entry above) without supporting evidence. *Jania novae-zealandiae* apparently has not been recorded from outside New Zealand.

officinalis

Basionym. *Corallina officinalis* Linnaeus, 1758: 805.

Type locality. in European oceans (Linnaeus, 1758: 805).

Lectotype. LINN 1293.9 (Irvine & Johansen, 1994: 44).

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Corallina officinalis* Linnaeus. — Lamouroux, 1823: 456 [NZ]. Lamouroux *et al.*, 1824: 212 [NZ]. Harvey, 1855a: 237 [Nor]. Harvey, 1867: 680 [Auc. NZ]. Harvey-Gibson, 1893: 162 [Sou]. Laing, 1896: 33 [Sou]. Reinbold, 1899b: 299 [Cha, NZ]. Laing, 1902: 357 [Cha, Nor, Sou]. Lemmermann, 1907:381 [Cha]. Gepp & Gepp, 1911: 23 [Ker]. Laing, 1916: 38 [Sou]. Oliver, 1923: 502, 503, 524, 525 [Nor]. Laing, 1926: 182 [Ker, NZ]. Laing, 1932: 41 [Sou]. Cranwell & Moore, 1935: 303, 313 [Nor]. Ambler & Chapman, 1950: 396, 399 [Nor]. Chapman, 1950: 67 [Nor]. Dellow, 1950: 361, 364, 368, 370 [Nor]. Carnahan, 1952: 38, 41, 45, 46 [Nor]. Knox, 1953: 195 [Sou]. Naylor, 1954: 655 [Sou]. Dellow, 1955: 79 [Nor]. Dellow & Cassie, 1955: 330 [Nor]. Batham, 1956: 455 [Sou]. Bergquist, 1960: 89, 90, 91 [Nor]. Chapman, 1961: 350 [Ker]. Adams, 1972: 75 [Nor]. Adams *et al.*, 1974: 219 [Ste]. Chapman & Parkinson, 1974: 180, pl. 61B [Cha, Ker, NZ]. South & Adams, 1976: 41 [Sou]. Nelson & Adams, 1984: 17 [Ker]. Parsons & Fenwick, 1984: 430 [Sou]. Tittley *et al.*, 1984: 62, 63 [Cha, Ker, NZ]. Nelson & Adams, 1987: 30 [Nor]. Nelson *et al.*, 1992: 40 [Sou]. Adams, 1994: 157, pl. 54 (upper left) [Cha, Ker, Nor, Sou, Ste]. Neale & Nelson, 1998: 108 [Sou]. Miller *et al.*, 2000: 16 [Nor]. Nelson *et al.*, 2002: 137 [Sou].

Comments. Irvine & Johansen (1994: 44), who have seen the type, provided a detailed account of *Corallina officinalis* in the British Isles along with a summary of information on the species obtained from other studies. Womersley & Johansen (1996b: 291) provided an account of the species in southern Australia.

Outside the New Zealand region, the species is widely reported, particularly in temperate waters (Irvine & Johansen, 1994: 45; Womersley & Johansen, 1996b: 291).

palmata

Basionym. *Corallina palmata* Ellis *et* Solander, 1786: 118, pl. 21, figs a, A.

Comments. See entry for *flicula*, the only form of the species recorded from the New Zealand region (as *Cheilosporum palmatum* var. *flicula*). *Corallina palmata* (var. *palmata*) was transferred to *Cheilosporum* by Yendo (1902b: 192) whereas f. *flicula* is considered to be a distinct species of *Arthrocardia* (see separate entry above).

pedunculata

Basionym. *Jania pedunculata* Lamouroux, 1816: 270, pl. 9, fig. 3.

Type locality. 'Australasie' (Lamouroux, 1816: 270).

Type. Missing or lost (see Womersley & Johansen, 1996b: 307).

Published illustrations of type material. Lamouroux, 1816: pl. 9, fig. 3; Anonymous, 1824: pl. 9, fig. 3.

Published records from the New Zealand region. *Jania pedunculata* Lamouroux. — Lemmermann, 1907: 381 [Cha]. Chapman & Parkinson, 1974: 177, text fig. 54 [Cha].

Corallina pedunculata (Lamouroux) Kützing, 1858: 37. — Reinbold, 1899b: 299 [Cha]. Laing, 1902: 357 [Cha]. Laing, 1926: 182 [Cha].

Comments. Johansen & Womersley (1994: 616) and Womersley & Johansen (1996b: 305) treated *Jania pedunculata* as a heterotypic synonym of *Jania verrucosa*. According to Womersley & Johansen (1996b: 307), however, Lamouroux's type of *Jania pedunculata* cannot be found in CN and a possible type fragment in PC has not been examined in a modern context. Thus *Jania pedunculata* is best considered a species of uncertain status and disposition until type material can be studied in detail in a modern context. Specimens upon which New Zealand records are based then require re-examination to determine their true identity.

pilifera

Basionym. *Corallina pilifera* Lamouroux, 1816: 289.

Type locality. 'Australasie' (Lamouroux, 1816: 290).

Type. CN, Lamouroux herbarium.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Corallina pilifera* Lamouroux. — Rabenhorst, 1878: 76 [Auc]. Levring, 1945: 16 [Cam]. Papenfuss, 1964: 29 [Auc].

Cornicularia pilifera (Lamouroux) Chapman *et* Parkinson, 1974: 185. — Chapman & Parkinson, 1974: 185, pl. 63A [Auc].

Comments. Based on a comparison of relevant types, Johansen & Womersley (1986: 563) concluded that *Corallina pilifera* Lamouroux was a heterotypic synonym of *Haliptilon roseum*. The specimens upon which New Zealand records of *pilifera* are based require re-examination to determine their correct identity.

pilulifera

Basionym. *Corallina pilulifera* Postels *et* Ruprecht, 1840: 20, pl. 40, fig. 101.

Type locality. 'Sibiria transbaicalensis (an mare Ochototense?)' (Postels & Ruprecht, 1840: 20).

Type. Presumably in LE (Staffleu & Cowan, 1983: 354-55).

Published illustrations of type material. Postels & Ruprecht, 1840: pl. 40, fig. 101.

Published records from the New Zealand region. *Corallina pilulifera* Postels *et* Ruprecht. — Cotton, 1915a: 192 [NZ]. Cotton, 1915b: 113 [NZ]. Laing, 1926: 181 [NZ?]. Levring, 1960: 41 [Cam]. Papenfuss, 1964: 29 [Cam]. Chapman & Parkinson, 1974: 180, text fig. 55 [Auc, NZ]. Tittley *et al.*, 1984: 63 [NZ]. Hay *et al.*, 1985: 37 [Cam]. Ramírez & Santelices, 1991: 204 [Cam].

Comments. Postels & Ruprecht (1840: 20) based *Corallina pilulifera* on ‘vidimus specimina ex Herbario Me de Bieberstein’ but did not designate a type. The species apparently has not been lectotypified. Consequently the status and disposition of the species are uncertain, and all records from the New Zealand region require re-assessment.

Outside the New Zealand region, *Corallina pilulifera* has been reported from various areas including Chile (Ramírez & Santelices, 1991: 204), the Falkland Islands (Cotton, 1915a: 192), China (Tseng, 1984), Korea (Lee & Kang, 2001: 317), Japan (Yoshida, 1998: 554) northeastern Russia (Klochkova, 1998: 400), and South Africa (Silva *et al.*, 1996: 232). All these records also require re-assessment. Mendoza (1999: 141) excluded the species from Tierra del Fuego.

pistillaris

Basionym. *Jania pistillaris* Montagne, 1845: 147.

Type locality. Bay of Islands, New Zealand.

Type. PC.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Jania pistillaris* Montagne. — Montagne, 1845: 147 [Nor]. Hooker & Harvey, 1845: 539 (p. 19 in independently paginated offprint) [Nor]. Raoul, 1846: 32 [NZ]. Harvey, 1849: 105 [Nor]. Harvey, 1855a: 237 [Nor]. Harvey, 1867: 680 [Nor]. Laing, 1902: 357 [Nor]. Laing, 1926: 181 [NZ].

Corallina pistillaris (Montagne) Montagne *ex* Kützing, 1849: 707. — Kützing, 1849: 707 [NZ]. Areschoug, 1852: 574 [NZ]. Montagne, 1856: 429 [Nor]. De Toni, 1905: 1850 [Nor].

Comments. The number of specimens upon which Montagne (1845) based *Jania pistillaris* is uncertain, and a detailed study of his original material has not been published. Thus, the status and disposition of the species are uncertain. Chapman & Parkinson (1974: 179), however, concluded that *Jania pistillaris* was conspecific with *Corallina armata* (see separate entry above) after comparing a small fragment of Montagne’s material with the Harvey’s illustration of *armata* (Harvey, 1849: pl. 40, lower right). This conclusion is premature as neither type has been studied in detail in a modern context.

Jania pistillaris apparently has not been recorded from outside New Zealand.

rosea

Basionym. *Corallina rosea* Lamarck, 1815: 235.

Type locality. ‘les mers Australes’ (Lamarck, 1815: 235).

Lectotype. PC, General Herbarium, unnumbered; designated by Johansen & Womersley, 1986: 552, legend to Fig. 1C.

Published illustrations of type material. Johansen & Womersley, 1986: fig. 1C.

Published records from the New Zealand region. *Cornicularia rosea* (Lamarck) Chapman *et* Parkinson, 1974: 184. — Chapman & Parkinson, 1974: 184, pls 60B, 62B [Nor, Sou, Ste].

Haliptilon roseum (Lamarck) Garbary *et* Johansen, 1982: 218. — Tittley *et al.*, 1984: 61, 62, 63 [Auc, Cha, NZ]. Johansen & Womersley, 1986: 551, figs 1-6 [NZ]. Nelson & Adams, 1987: 30 [Nor]. Huisman & Walker, 1990: 411 [NZ]. Millar, 1990: 321, figs 11A, 11B [NZ]. Nelson *et al.*, 1991: 31.[Cha]. Nelson *et al.*, 1992: 40

[Sou]. Adams, 1994: 158, pl. 54 (lower half) [Ant, Auc, Bou, Cam, Cha, Ker, Kin, Nor, Sna, Sou, Ste]. Nelson & Phillips, 1996: 558 [Nor]. Womersley & Johansen, 1996b: 310, pl. 4, fig. 4, text fig. 141 [NZ]. Adams, 1997: 29, pl. 32 (lower) [Ant, Auc, Bou, Cam, Cha, Ker, Kin, Nor, Sna, Sou, Ste]. Huisman, 1997: 208 [NZ]. Neale & Nelson, 1998: 108 [Sou]. Huisman, 2000: 51, including two unnumbered figures [NZ]. Miller *et al.*, 2000: 13, 19, 36, 40 [Nor]. Nelson *et al.*, 2002: 137 [Sou].

Comments. Johansen & Womersley (1986) provided a detailed account of the species, including the type.

Outside the New Zealand region, *Halitilon roseum* has been confirmed to occur along the western, southern and eastern coasts of Australia (Womersley & Johansen, 1996b: 313). The species also has been recorded from the Juan Fernandez Islands (Etcheverry, 1986: 210) and from various localities in the Indian Ocean (Silva *et al.*, 1996: 233-234).

rubens

Basionym. *Corallina rubens* Linnaeus, 1758: 806.

Type locality. 'Oceano Europeo' Linnaeus (1758: 805).

Lectotype. UPS, Herb. Burser vol. XX: 72; lectotypified by Irvine in Irvine & Johansen, 1994: 56)

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Jania rubens* (Linnaeus) Lamouroux, 1816: 272. — Naylor, 1954: 655 [Sou]. Dellow, 1955: 79 [Nor]. Chapman, 1961: 350 [Ker]. Burrows, 1972: 18 [Sou]. Nelson & Adams, 1984: 17 [Ker]. Tittley *et al.*, 1984: 63 [NZ].

Comments. Irvine & Johansen (1994: 53-56) provided an account of the species and mentioned earlier papers with further data. Nelson & Adams (1984: 17) included the Chapman (1961: 350) record of *Jania rubens* under *Jania micrarthrodia*. Other New Zealand region records require confirmation.

Elsewhere, Irvine & Johansen (1994: 55) stated that the species occurs in the Mediterranean (records summarized by Babbini & Bressan, 1997: 88-96) and along both sides of the Atlantic Ocean, while Littler & Littler (2003: 34) stated that the species is pantropical. Silva *et al.* (1996: 244) listed records for the Indian Ocean.

sagittata

Basionym. *Corallina sagittata* Lamouroux, 1825-1826: 625, pl. 95, figs 11, 12.

Type locality. Ile de France (Mauritius).

Type. CN, Lamouroux herbarium.

Published illustrations of type material. Lamouroux, 1825-1826: pl. 95, figs 11, 12.

Published records from the New Zealand region. *Cheilosporum sagittatum* (Lamouroux) Areschoug, 1852: 545. — Nelson & Adams, 1984: 17 [Ker]. Adams & Nelson, 1985: 17 [Kin]. Nelson & Adams, 1987: 30 [Nor]. Millar, 1990: 319, figs 10D – 10F [NZ]. Nelson *et al.*, 1992: 40 [Sou]. Adams, 1994: 159, pl. 55 (upper right) [Nor, Sou]. Miller *et al.*, 2000: 15, 23 [Nor]. Moura & Guimarães, 2002: 72 [NZ].

Comments. Accounts of the species were provided by Johansen (1977), who examined the type, and by Womersley & Johansen (1996b: 315-317) and Moura & Guimarães (2002: 69-74). Womersley & Johansen (1996b: 315) and

Moura & Guimarães (2002: 69) listed *Amphiroa elegans* as a heterotypic synonym of *Cheilosporum sagittatum*; further comments occur under the entry for *elegans* above.

Outside the New Zealand region, Womersley & Johansen (1996b: 317) and Moura & Guimarães (2002: 72) reported *Cheilosporum sagittatum* to occur in Australia, Mauritius, South Africa, the Philippines and Brazil. Silva *et al.* (1996: 229-230) listed records from the Indian Ocean.

tribulus

Basionym. *Corallina tribulus* Ellis *et* Solander, 1786: 124, pl. 21, fig. e.

Type locality. West-Indian Islands (Ellis & Solander, 1786: 124).

Type. Whereabouts uncertain; see comments.

Published illustrations of type material. Ellis & Solander, 1786: pl. 21, fig. e.

Published records from the New Zealand region. *Amphiroa tribulus* (Ellis *et* Solander) Lamouroux, 1816: 302. — Tittley *et al.*, 1984: 63 [Ker].

Comments. The whereabouts of specimens upon which Ellis & Solander (1786) based *Corallina tribulus* is unknown. Dixon (1960) was unable to locate the Ellis herbarium and suggested that it should be assumed to be lost.

Lamouroux (1816: 302) transferred the species into *Amphiroa*, and most subsequent authors have accepted this, but the relationship between more modern concepts of the species (see references below) and the original specimens of Ellis & Solander cannot be determined until the latter are located or the species is neotypified. Consequently, the status and disposition of *Corallina tribulus* are uncertain.

The Kermadec specimen cited in Tittley *et al.* (1984) requires re-examination to determine its true identity; the name *tribulus* has not otherwise been applied to specimens from the Kermadec Islands (see Nelson & Adams, 1984) or from elsewhere in the New Zealand region.

Littler & Littler (2000: 24) provided a description of *Amphiroa tribulus* from the Caribbean, and (Littler & Littler, 2003: 26) stated that the species occurs in the tropical Pacific, the Indian Ocean and the Caribbean Sea. Indian Ocean records are listed by Silva *et al.* (1996: 225). Specimens from Africa, Asia, the Pacific and all shores of Australia (Tittley *et al.*, 1984: 20) also have been identified as *Amphiroa tribulus*, but all require re-assessment. Womersley & Johansen (1996a), however, did not record the species from southern Australia

ungulata

Basionym. *Corallina ungulata* Yendo, 1902a: 26, pl. 3, figs 7, 8, pl. 7, fig. 8.

Comments. *Corallina ungulata* f. *brevior* but not *Corallina ungulata* f. *ungulata* has been recorded from the New Zealand region. Further data are provided in the entry for *brevior*. Yendo (1905: 38) transferred *Corallina ungulata* f. *ungulata* into *Jania*, where it currently is recognized as a distinct species (e.g. Silva *et al.*, 1996: 245; Yoshida, 1998: 569; Lee & Kang, 2001: 399).

verrucosa

Basionym. *Jania verrucosa* Lamouroux, 1816: 270, pl. 9, fig. 4.

Type locality. 'Amerique Meridionale' (Lamouroux, 1816: 270).

Type. CN, Lamouroux herbarium.

Published illustrations of type material. Lamouroux, 1816: pl. 9, fig. 4.

Published records from the New Zealand region. *Jania verrucosa* Lamouroux. — Tittley *et al.*, 1984: 63 [NZ]. Johansen & Womersley, 1994: 616, figs 15, 16, 37-39 [NZ]. Nelson & Phillips, 1996: 557 [Nor]. Womersley & Johansen, 1996b: 305, fig. 138 [NZ]; Johansen, 1999: 190, fig. 48D [NZ].

Comments. The type of *Jania verrucosa* has not been studied in detail in a modern context. Nevertheless, Johansen & Womersley (1994: 616) applied the name to specimens from southern Australia and listed *J. crassa* (see separate entry above), based on a New Zealand type, as a heterotypic synonym. The proposed conspecificity, however, needs to be confirmed through a comparative study of both types, after which New Zealand records can be assessed properly.

According to Johansen & Womersley (1994: 615), *Jania verrucosa* occurs in New Zealand, southern and eastern Australia, South Africa, California U.S.A., Mexico, and Peru. Indian Ocean records are listed in Silva *et al.* (1996: 245).

virgata

Basionym. *Corallina virgata* Zanardini, 1840a: 136.

Type locality. Presumably Spalato, Adriatic Sea; see comments.

Type. Museo civico di Storia naturale, Venice, Italy (Stafleu & Cowan, 1988: 516).

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Corallina virgata* Zanardini. — Laing, 1909: 525 [Ant].

Comments. After examining the thallus surface of a fragment of the type, Garbary & Johansen (1982) transferred the species to *Haliptilon* [i.e. *Haliptilon virgatum* (Zanardini) Garbary & Johansen]. This needs to be confirmed from a more detailed study of the type to determine whether it belongs to *Haliptilon* as currently circumscribed (see Womersley & Johansen 1996b).

Zanardini (1840a) did not indicate where his original material was collected, but subsequently (Zanardini, 1840b: 208; p. 16 of independently paginated offprint) included the species in a list of algae from the Adriatic Sea. The only specimen of *C. virgata* in Zanardini's herbarium (De Toni & Levi, 1888: 48) is from Spalato on the Adriatic coast, which therefore is the presumed type locality.

Hay *et al.* 1985: 37 included the Laing (1909: 525) record of *Corallina virgata* Zanardini under *C. granifera* (see separate entry above), referring to the remark of Papenfuss (1964: 28) that Laing probably misidentified his material. Chapman & Parkinson (1974: 186) excluded *C. virgata* from the New Zealand flora.

According to Babbini & Bressan (1997: 74), *Corallina virgata* occurs in the Mediterranean Sea and in the 'Indo-Atlantique tempérée froide'. Silva *et al.* (1996), however, did not list the species for the Indian Ocean.

wardii

Basionym. *Amphiroa wardii* Harvey, 1849: 99, pl. 38 (upper right).

Type locality. Port Phillip [Bay], Victoria, Australia. (Harvey, 1849: 99 incorrectly placed Port Phillip in South Australia.)

Type. TCD (Harvey, 1849: 99).

Published illustrations of type material. Harvey, 1849: pl. 38 (upper right); Womersley & Johansen, 1988: fig. 1A.

Published records from the New Zealand region. *Amphiroa wardii* Harvey. — Agardh, 1871: 435 [Cha]. Mueller, 1871: 215 [Cha]. Mueller, 1874: 209 [Cha].

Arthrocardia wardii (Harvey) Areschoug, 1852: 551. — Reinbold, 1899b: 299 [Cha, NZ]. Laing, 1902: 357 [Cha]. Laing, 1926: 181 [Cha, NZ]. South & Adams, 1976: 41. [Sou]. Parsons & Fenwick, 1984: 429 [Sou]. Tittley *et al.*, 1984: 22, 62, 63 [Cha, NZ]. Nelson *et al.*, 1991: 31. [Cha]. Nelson *et al.*, 1992: 41 [Sou]. Adams, 1994: 159 [Cha, Nor, Sou]. Womersley & Johansen, 1996b: 293, fig. 133 (New Zealand occurrence with a question mark). Neale & Nelson, 1998: 108 [Sou]. Nelson *et al.*, 2002: 137 [Sou].

Cheilosporum wardii (Harvey) De Toni, 1905: 1828. — Foslie, 1906a: 8 [Cha]. Cotton, 1907: 43 [Cha]. Lemmermann, 1907: 381 [Cha]. Adams, 1972: 75 [Nor]. Chapman & Parkinson, 1974: 174, pl. 56 [Cha, Nor, Sou, Ste].

Comments. Womersley & Johansen (1988), who examined the type, provided a detailed account of *Arthrocardia wardii*, and later (Womersley & Johansen, 1996b: 295) questioned the occurrence of the species in New Zealand. Nelson *et al.* (1991) suggested that the record of Reinbold (1899b: 299) might pertain to *A. corymbosa* (see separate entry above). All New Zealand region records require verification through examination of relevant vouchers.

Outside New Zealand, the species has been confirmed to occur in southern and eastern Australia (Womersley & Johansen, 1996b: 295). It also is reported from Madagascar (Hariat, 1902: 472; Silva *et al.*, 1996: 227).

Non-geniculate corallines

agariciformis

Basionym. *Millepora agariciformis* Pallas, 1766: 263.

Comments. The New Zealand region records of Reinbold (1899b: 300) and Laing (1902) for *Lithothamnion agariciforme* f. *decussata* (Ellis & Solander) Foslie are treated below under the entry for '*decussata*'. *Lithothamnion agariciforme* (Pallas) Foslie f. *agariciforme* has not been reported from the New Zealand region, and the species has not been lectotyped. Moreover, efforts to locate original material of Pallas have been unsuccessful, and thus the status and disposition of the species are unresolved (Woelkerling, 1998b: 245-252; Athanasiadis, 1999: 243, 246).

amplexifrons

Basionym. *Melobesia amplexifrons* Harvey, 1849: 110.

Type locality. Port Natal, South Africa.

Lectotype. TCD, unnumbered; designated by Woelkerling & Campbell (1992: 98).

Published illustrations of type material. Woelkerling & Campbell, 1992: fig. 63a.

Published records from the New Zealand region. *Melobesia amplexifrons* Harvey. — Harvey-Gibson, 1893: 162 [Sou]. Laing, 1895: 317 [NZ]. Reinbold, 1899b: 300 [Cha]. Laing, 1902: 358 [Cha, NZ]. Laing, 1926: 179 [Cha, NZ].

Lithophyllum amplexifrons (Harvey) Heydrich, 1897a: 51. — Lemmermann, 1907: 381 [Cha]. Chapman & Parkinson, 1974: 192, pl. 64A (author incorrectly cited as '(Harvey) Chihara') [Sub].

Pneophyllum amplexifrons (Harvey) Chamberlain *et* Norris, 1994: 10. — Chamberlain & Norris, 1994: 10, figs 1-45 [NZ, unconfirmed].

Comments. Chamberlain & Norris (1994) transferred *amplexifrons* into *Pneophyllum* and published a detailed study of the species, including the type. Woelkerling & Campbell (1992: 98-99, fig. 63a) and Woelkerling (1993: 25) provided additional information on lectotype and isolectotype material.

All New Zealand records require verification. Records from Australia are spurious or unconfirmed (Woelkerling & Campbell, 1992: 98; Chamberlain & Norris, 1994: 15). Chamberlain & Norris (1994) confirmed that the species occurs in South Africa, Mozambique and Madagascar. They (1994) also reported that some or all records from India, Japan, Indonesia, New Guinea, New Zealand, Guadeloupe and California are spurious or unconfirmed, while Mendoza (1999: 141), excluded the species from Tierra del Fuego.

antarctica

Basionym. *Melobesia verrucata* var. *antarctica* Hooker *et* W. H. Harvey, *in* Harvey & Hooker, 1847a: 482.

Type locality. Hermite Island, Tierra del Fuego, Chile.

Lectotype. BM, algal herbarium; designated by May & Woelkerling (1988: 68). The number 8 is written in the lower right corner of the herbarium sheet, near the locality information. The sheet is stamped Herbarium Hookerianum.

Published illustrations of lectotype material. May & Woelkerling, 1988: fig. 40.

Published records from the New Zealand region. *Melobesia verrucata* var. *antarctica* Hooker *et* W. H. Harvey. — Harvey & Hooker, 1847a: 482 [Auc, NZ]. Harvey & Hooker, 1847b: 176 [Auc, NZ].

Melobesia antarctica (Hooker *et* W. H. Harvey) Hooker *et* Harvey, *in* Harvey, 1849: 111. — Harvey, 1867: 681 [Auc]. Rabenhorst 1878: 76 [Auc]. Dickie, 1879: 58 [Auc, NZ]. Askenasy, 1888: 54 [Auc]. Askenasy, 1889: 54 [Auc]. Laing, 1895: 316 [NZ]. Laing, 1909: 525 [Auc]. Tittley *et al.*, 1984: 61, 63 [Auc, NZ].

Lithophyllum antarcticum (Hooker *et* W. H. Harvey) Rosanoff, 1866: 85. — Laing, 1905: 384 [Sou].

Lithothamnion antarcticum (Hooker *et* W. H. Harvey) Heydrich, 1901: 543. — Foslie, 1907c: 3 [Auc]. Gain, 1912: 141 [Auc]. Lemoine, 1912: LIV [Auc, NZ]. Lemoine, 1913: 4 [NZ]. Lemoine, 1915b: 193 [Auc]. Mazza, 1916-1922: 1098 [Auc, NZ]. Mazza, 1917: 102 [Auc, NZ]. Lemoine, 1920: 15 [Auc]. Skottsberg, 1923: 64 [Auc]. Levring, 1944: 8 [Auc]. Levring, 1960: 36 [Auc]. Papenfuss, 1964: 30 [Auc]. Adey & Lebednik, 1967: 68 [Auc]. Chapman & Parkinson, 1974: 197, pl. 66A [Auc]. Johnson, 1975: 53 [Auc]. Hay *et al.*, 1985: 38 [Auc]. Ramírez & Santelices, 1991: 213 [Auc].

Lithothamnion lichenoides var. *antarctica* (Hooker *et* W. H. Harvey) Foslie *ex* De Toni *et* Forti, 1922: 59. — De Toni & Forti, 1922: 59 [Auc, NZ].

Comments. Based on a comparative study of types, May & Woelkerling (1988: 68-69) concluded that *Melobesia verrucata* var. *antarctica* was a heterotypic synonym of *Synarthrophyton patena* (see separate entry below). May & Woelkerling (1988: 69) also suggested that the epithet *antarctica* had been misapplied to specimens that are both specifically and generically distinct from *Synarthrophyton patena*, and that the identity of these specimens needed to be determined from a re-examination of the material upon which the published

records are based. Woelkerling (1993: 28) also provided further information on type material.

New Zealand records and other information pertaining to *Melobesia verrucata* Lamouroux are dealt with below under the entry for *verrucata*.

asperulum

Basionym. *Lithothamnion repandum* f. *asperulum* Foslie, 1906a: 5.

Type locality. Island Bay, Wellington, New Zealand.

Lectotype. TRH, Setchell 6346 - 6348, including slides 1139, 1141, 1142, 1167 & 1168; designated by Woelkerling (1993: 31).

Published illustrations of type material. Printz, 1929: pl. 1, figs 4 - 6.

Published records from the New Zealand region. *Lithothamnion repandum* f. *asperulum* Foslie. — Foslie, 1906a: 5, 21 [Nor]. Foslie, 1907a: 3 [NZ]. Woelkerling, 1993: 31 [Nor]. Wilks & Woelkerling, 1994: 192, 195 [Nor]

Lithothamnion asperulum (Foslie) Foslie, 1907b: 6. — Foslie, 1907b: 6 [NZ]. De Toni, 1924: 625 [Nor]. Laing, 1926: 180 [Nor]. Printz, 1929: pl. 1, figs 4 - 6 [Nor]. Levring, 1945: 15 [Cam, NZ]. Papenfuss, 1964: 30 [Cam]. Adey & Lebednik, 1967: 49 [Nor]. Adams, 1972: 74 [Nor]. Chapman & Parkinson, 1974: 195, pl. 66B [Cam, Nor].

Leptophytum asperulum (Foslie) Adey, 1970: 29. — Adey, 1970: 29 [U]. Zaneveld & Sanford, 1980: 222, fig. 20 [Cam, NZ].

Comments. Based on a study of relevant types, Wilks & Woelkerling (1994: 195) concluded that *Lithothamnion repandum* f. *asperulum* was a heterotypic synonym of *Phymatolithon repandum*. Woelkerling (1993: 31) had earlier summarized general information on the type of *asperulum*. Woelkerling (1993: 31) and Wilks & Woelkerling (1994: 192) mistakenly listed the type locality as Bay of Islands and inadvertently omitted mention of slides 1141 & 1142 (see Adey & Lebednik, 1967: 49).

The nature of possible type material in LD (see Chapman & Parkinson, 1974: legend to pl. 66B) requires further investigation

aucklandicum

Basionym. *Lithothamnion fumigatum* f. *aucklandicum* Foslie, 1905: 16.

Type locality. Auckland Islands, New Zealand (more precise locality unknown).

Holotype. TRH, unnumbered.

Published illustrations of type material. Printz, 1929: pl. 4, fig. 17.

Published records from the New Zealand region. *Lithothamnion fumigatum* f. *aucklandicum* Foslie. — Foslie, 1905: 16 [Auc]. Tittley *et al.*, 1984: 11, 32 [Auc]. Woelkerling, 1993: 33 [Auc].

Lithothamnion aucklandicum (Foslie) Foslie, 1907b: 18. — Foslie, 1907b: 18 [Auc]. Gain, 1912: 141 [Auc]. Lemoine, 1913: 4, 31 [Auc]. De Toni, 1924: 628 [Auc]. Laing, 1926: 180 [Auc]. Printz, 1929: 39, pl. 4, fig. 17 [Auc]. Papenfuss, 1964: 30 [Auc]. Adey & Lebednik, 1967: 83 [Auc]. Chapman & Parkinson, 1974: 196, pl. 69B [Auc]. Hay *et al.*, 1985: 38 [Auc].

Mesophyllum aucklandicum (Foslie) Adey, 1970: 22. — Adey, 1970: 22 [U].

Comments. Based on the examination of relevant types, Woelkerling & A. Harvey (1993: 586) concluded that *Lithothamnion fumigatum* f. *aucklandicum* was a heterotypic synonym of *Mesophyllum engelhartii* (see separate entry below). General information on the type of *aucklandicum* was provided by Woelkerling

(1993: 33). The nature of possible type material in BM (Tittley *et al.*, 1984: 11) requires further investigation.

calcareum

Basionym. *Millepora calcarea* Pallas, 1766: 265.

Type locality. St Mawes Bank, Falmouth Harbour, Cornwall, England.

Neotype. BM, box collection 1626; designated by Woelkerling & Irvine, 1986: 76.

Published illustrations of type material. Woelkerling & Irvine, 1986: figs 1-15.

Published records from the New Zealand region. *Melobesia calcarea* (Pallas) Harvey, 1849: 110. — Harvey, 1849: 110. Harvey, 1850: pl. CCXCI [NZ]. Harvey, 1855a: 238 [NZ]. Harvey, 1867: 681 [Nor].

Lithothamnion calcareum (Pallas) Areschoug, 1852: 523. — Areschoug, 1852: 523 [NZ]. Laing, 1902: 358 [Nor]. De Toni, 1905: 1745 [NZ]. Laing, 1926: 180 [NZ]. Chapman & Parkinson, 1974: 196, pl. 68 [NZ]. Nelson & Adams, 1987: 30 [Nor].

Comments. *Millepora calcarea* was transferred into *Phymatolithon* by Adey & McKibbin (1970: 100) and is the type species of that genus (Woelkerling & Irvine, 1986). Woelkerling & Irvine (1986) provided a detailed account of the neotype, while Chamberlain & Irvine (1994b: 212-215, figs 8C, 74, 75, 103, 104) produced a detailed account of the species for the British Isles. All New Zealand records require verification.

Elsewhere, *Phymatolithon calcareum* has been reported from Atlantic Europe and the Mediterranean (Chamberlain & Irvine, 1994b: 213; Babbini & Bressan, 1997: 288).

capense

Basionym. *Lithophyllum capense* Rosanoff, 1866: 86, pl. 6, figs 13, 15.

Type locality. Cape Agulhas, South Africa.

Lectotype. CN, Hohenacker specimen 236 in *Algae Marinae Siccatae*; designated by Chamberlain in Woelkerling & Verheij, 1995: 38.

Published illustrations of type material. Chamberlain, 2000: figs 1, 13-16, 30.

Published records from the New Zealand region. *Lithothamnion capense* (Rosanoff) Foslie, 1898: 7. — Lemoine, 1912: LIV [NZ].

Comments. Chamberlain (2000) published a detailed account of the species, including lectotype material, and concluded that it represented a distinct species of *Mesophyllum*. Isolectotype material is present in L (Woelkerling & Verheij, 1995: 38) and PC (Woelkerling, 1998c: 306, fig. 166).

The occurrence of the species in New Zealand needs to be verified through re-examination of the collection cited by Lemoine (1912: LIV). According to Chamberlain (2000: 368), who did not examine the New Zealand collection, the species is not known outside South Africa.

carpophylli

Basionym. *Melobesia carpophylli* Heydrich, 1893: (78).

Type locality. Bay of Islands, New Zealand.

Syntype material. TRH, unnumbered, includes slide 300.

Published illustrations of type material. Printz, 1929: pl. 72, fig. 15.

Published records from the New Zealand region. *Melobesia carpophylli* Heydrich. — Heydrich, 1893: (78) [Nor]. Laing, 1905: 384 [Nor]. Woelkerling, 1993: 48 [Nor].

Lithophyllum carpophylli (Heydrich) Heydrich, 1897a: 52. — Heydrich, 1897a: 52, pl. 5, fig. 5 [NZ]. Reinbold, 1899b: 300 [Cha]. Laing, 1902: 358 [Cha, NZ]. De Toni, 1905: 1793 [NZ]. Lemmermann, 1907:381 [Cha, NZ]. Foslie, 1909: 51 [Cha, NZ]. Laing, 1926: 180 [Cha, Nor]. Printz, 1929: pl. 72, figs 15-16 [Cha, Nor]. Cranwell & Moore, 1935: 313 [Nor]. Adey & Lebednik, 1967: 41 [Cha]. Adams, 1972: 74 [Nor].

Dermatolithon carpophylli (Heydrich) Foslie, 1909: 58. — De Toni, 1924: 668 [NZ]. Dawson, 1955: 275 [NZ].

Tenarea carpophylli (Heydrich) Chapman *et* Parkinson, 1974: 190. — Chapman & Parkinson, 1974: 190, pl. 63B [Cha, Nor]. Nelson & Adams, 1987: 30 [Nor]. Nelson *et al.*, 1991: 32.[Cha]. Nelson *et al.*, 1992: 41 [Sou]. Adams, 1994: 177, pl. 55 (lower right) [Cha, Nor]. Nelson & Phillips, 1996: 574 [Nor].

Comments. Heydrich (1893) did not designate a type, and his main herbarium, bequeathed to the Botanischen Museums zu Berlin-Dahlem (B) in 1911 (Urban, 1916: 141), was destroyed during World War II (Hiepko, 1987: 230). The only known syntype material is in TRH (Woelkerling, 1993: 48) and has not been examined in detail in a modern context. The species apparently has not been recorded outside the New Zealand region.

caulerpae

Basionym. *Melobesia caulerpae* Foslie, 1906a: 16.

Type locality. Island Bay, Wellington, New Zealand.

Holotype. TRH, Setchell 6080a.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Melobesia caulerpae* Foslie. — Foslie, 1906a: 16 [Nor]. De Toni, 1924: 648 [NZ]. Laing, 1926: 179 [Nor]. Adams, 1972: 73 [Nor]. Adams *et al.*, 1974: 218 [Ste]. Chapman & Parkinson, 1974: 188, text fig. 57 [Nor, Sou]. Woelkerling, 1993: 49 [Nor].

Heteroderma caulerpae (Foslie) Foslie, 1909: 55. — Adey & Lebednik, 1967: 35 (within the listing for *Melobesia lejolisii*) [NZ]. Adey, 1970: 16 [U]. South & Adams, 1976: 41.[Sou]. Adams & Nelson, 1985: 17 [Kin]. Hay *et al.*, 1985: 38 [Sna]. Nelson *et al.*, 1991: 32.[Cha]. Adams, 1994: 177 [Cha, Ker, Kin, Nor, Sou, Ste].

Pneophyllum caulerpae (Foslie) Jones *et* Woelkerling, 1984: 184, fig. 18. — Chamberlain, 1994a: 133, figs 60, 61 [NZ]. Barry & Woelkerling, 1995: 141 [Nor].

Comments. Woelkerling (1993: 49) summarized general information on the type. Subsequently, Penrose (1996b: 269) considered *Melobesia caulerpae* to be a heterotypic synonym of *Pneophyllum coronatum* (see separate entry below) based on the examination of relevant types.

The correct type locality (Foslie, 1906a: 16) is Island Bay (near Wellington), not Castlepoint (Chapman & Parkinson, 1974: 188) or Bay of Islands (Woelkerling, 1993: 49; Adams, 1994: 177; Chamberlain, 1994a: 133; Barry & Woelkerling, 1995: 141).

chathamense

Basionym. *Lithothamnion chathamense* Foslie, 1906b: 18 (p. 2 of independently paginated offprint).

Type locality. Chatham Islands (more precise locality unknown).

Holotype. TRH, unnumbered, includes slides 301, 302, 456.

Published illustrations of type material. Printz, 1929: pl. 9, fig. 10. Keats & Chamberlain, 1997: figs 92 – 101.

Published records from the New Zealand region. *Lithothamnion chathamense* Foslie. — Foslie, 1906b: 18 (p. 2 of independently paginated offprint) [Cha]. Foslie, 1908a: 269 [Cha]. Lemoine, 1913: 15 [Cha]. De Toni, 1924: 643 [Cha]. Laing, 1926: 180 [Cha]. Printz, 1929: pl. 9, fig. 10 [Cha]. Adey & Lebednik, 1967: 69 [Cha]. Chapman & Parkinson, 1974: 199, pl. 71A [Cha]. Woelkerling, 1993: 50 [Cha]. Keats & Chamberlain, 1997: 73, figs 92-101[Cha].

Mesophyllum chathamense (Foslie) Adey, 1970: 23. — Adey, 1970: 23 [U].

Comments. Woelkerling (1993: 50) summarized general information on the type. Subsequently, Keats & Chamberlain (1997) provided a detailed account of the holotype but concluded that generic placement was uncertain in the absence of information about spermatangial branches. The holotype is of monomerous construction and has multiporate conceptacles, but epithallial cells do not appear flared, thus precluding placement in *Lithothamnion*. Adey (1970: 23) placed the taxon in *Mesophyllum* without providing comments. Until generic placement is determined, the status of *chathamense* at species level also will remain unclear.

The species apparently has not been reported outside the Chatham Islands.

cladophorae

Basionym. *Schmitziella cladophorae* Chapman, 1951: 84, fig.1.

Type locality. Ringa, Ringa, Stewart Island, New Zealand.

Neotype. AKU 7047; designated by Woelkerling & Irvine (1982: 291).

Published illustrations of type material. Woelkerling & Irvine, 1982: figs. 18-21.

Published records from the New Zealand region. *Schmitziella cladophorae* Chapman. — Chapman, 1951: 84, fig. 1 [NZ]. Chapman, 1961: 350 [Ker]. Denizot, 1968: 206 [NZ]. Adams *et al.*, 1974: 218 [Ste]. Chapman & Parkinson, 1974: 157, text fig. 47 [NZ]. South & Adams, 1976: 42.[Sou]. Woelkerling & Irvine, 1982: 290, figs. 18-21[NZ, Ste]. Nelson *et al.*, 1998: 72 [Ste].

Comments. Chapman (1951) did not designate a type, list a type locality, or list the specimens examined in the protologue of *Schmitziella cladophorae*. Subsequently, Woelkerling & Irvine (1982: 290 - 291), neotypified *Schmitziella cladophorae* with a Lindauer specimen in AKU, explained the basis of the neotypification, and concluded from an examination of the neotype (and three other relevant pre-protologue collections) that *Schmitziella cladophorae* Chapman was conspecific with and thus a heterotypic synonym of *Melobesia membranacea* (Esper) Lamouroux. All published records listed above are ultimately based on the original account of Chapman and thus pertain to misidentified plants of *Melobesia membranacea*.

corallinae

Basionym. *Melobesia corallinae* P.L. et H.M. Crouan, 1867: 150.

Type locality. Banc du Chateau et Baie de la Ninon, rade de Brest, France.

Lectotype. CO, unnumbered, Herbarium P.-L. & H.M. Crouan; designated by Chamberlain, 1991: 67.

Published illustrations of type material. Chamberlain, 1991: figs 208, 220; Woelkerling & Campbell, 1992: fig. 22.

Published records from the New Zealand region. *Dermatolithon corallinae* (P.L. et H.M. Crouan) Foslie, in Børgesen, 1902: 402. — Johnson, 1975: 53 [Auc].

Titanoderma corallinae (P.L. et H.M. Crouan) Woelkerling, Chamberlain et Silva, 1985: 333. — Chamberlain, 1991: 66, figs 52j, 208-224 [NZ]. Chamberlain & Irvine, 1994a: 90, figs 34, 35 [NZ].

Comments. Detailed accounts of the species, including type material have been published by Chamberlain (1991, as *Titanoderma*) and by Woelkerling & Campbell (1992, as *Lithophyllum*).

Lithophyllum corallinae is reported to be widespread (Woelkerling, 1996b: 233) or ‘probably cosmopolitan’ (Chamberlain & Irvine, 1994a: 93), but many records outside Eurpoe require confirmation, including those from the New Zealand region.

coronata

Basionym. *Melobesia coronata* Rosanoff, 1866: 64, pl. 4, fig. 9.

Type locality. Port Phillip Bay, Victoria, Australia.

Holotype. CN, unnumbered.

Published illustrations of type material. Rosanoff, 1866: pl. 4, fig. 9.

Published records from the New Zealand region. *Pneophyllum coronatum* (Rosanoff) Penrose, in Chamberlain, 1994b: 141. — Penrose, 1996b: 267, fig. 122 [NZ].

Comments. Penrose (1996b: 267-269) provided an account of the species in southern Australia and concluded from a comparative study of the types that *Melobesia caulerpae* (based on a New Zealand type; see separate entry above) was a heterotypic synonym of *Pneophyllum coronatum*. Earlier, Chamberlain (1994b) had published an account of the species (as *Pneophyllum caulerpae*) for South Africa.

Outside the New Zealand region, *Pneophyllum coronatum* is reported from Australia and the Malay Archipelago (Penrose, 1996b: 269), Indonesia (Silva et al., 1996: 268), South Africa (Chamberlain, 1994b), and Britain and Ireland (Hardy & Guiry, 2003: 178). The heterotypic synonym *Pneophyllum caulerpae* is recorded from Sri Lanka (Silva et al., 1996: 267) as well as the British Isles, Norway to the Mediterranean and Madagascar (Chamberlain, 1994a: 134). Chamberlain (1994a: 134, as *caulerpae*) thought the species was probably widely distributed, while Babbini & Bressan (1997: 231, as *caulerpae*) considered the species to be subcosmopolitan.

cystocarpideum

Basionym. *Lithothamnion cystocarpideum* Foslie, 1906a: 7.

Type locality. Chatham Islands (more precise locality unknown).

Holotype. TRH, Maltby no. 39, including slides 1191 & 1192.

Published illustrations of type material. Printz, 1929: pl. 10, figs 7 - 9.

Published records from the New Zealand region. *Lithothamnion cystocarpideum* Foslie. — Foslie, 1906a: 6, 7 [Cha]. Cotton, 1907: 42 [Cha]. De Toni, 1924: 613 [Cha]. Laing, 1926: 180 [Cha]. Printz, 1929: pl. 10, figs 7-9 [Cha]. Adey & Lebednik, 1967: 68 [Cha]. Masaki, 1968: 11, pls 5, 6, 43, 44 [Cha]. Chapman &

Parkinson, 1974: 198, pl. 70A [Cha]. Park, 1977: 62, pl. 1, figs 6 – 7, pl 5, figs 1 – 6 [Cha]. Tittley *et al.*, 1984: 62 [Cha]. Woelkerling, 1993: 69 [Cha].

Mesophyllum cystocarpideum (Foslie) Adey, 1970: 23. — Adey, 1970: 23 [U]. Park, 1980: 4, pl. 1, fig. 1; text fig. 2 [Cha]. Littler & Littler, 2003: 40 [Cha].

Comments. The type has not been studied in detail in a modern context, and thus the status and disposition of the species is uncertain. Adey (1970: 23) transferred the species into *Mesophyllum* without providing a detailed account. Woelkerling (1993: 69) summarized general information on the type. The nature of possible type material in BM (Tittley *et al.*, 1984: 10) requires assessment.

Outside the New Zealand region, Masaki (1968: 11, 12) applied the name to some Japanese collections, but indicated that the identification was uncertain pending examination of the type. Records from Korea (summarised by Lee & Kang, 2001: 413 – 414) and the Galapagos Islands (Masaki, 1968: 11; Chapman & Parkinson, 1974: 198; Park, 1977: 62) require re-assessment once the type is fully studied. Littler & Littler (2003: 40) reported the species from the tropical and subtropical Pacific.

decumbens

Basionym. *Lithophyllum decussatum* f. *decumbens* Foslie, 1900: 33.

Published records from the New Zealand region. *Lithophyllum decussatum* f. *decumbens* Foslie. — Chapman & Parkinson, 1974: 193 [Cha].

Comments. The Chapman & Parkinson (1974: 193) record of *Lithophyllum decussatum* f. *decumbens* Foslie from the Chatham Islands is spurious. Chapman & Parkinson (1974: 193) incorrently suggested that *Lithophyllum decussatum* f. *decumbens* Foslie was recorded from the Chatham Islands by Reinbold (1899b: 300) and by Laing (1926: 179). In reality, neither Reinbold nor Laing recorded Foslie's taxon but rather the taxon originally described as *Millepora decussata* Ellis *et* Solander (1786: 131). Reinbold recorded the taxon as *Lithothamnion agariciforme* f. *decussata* (Ellis *et* Solander) Foslie, while Laing listed the taxon as *Lithophyllum decussatum* (Ellis *et* Solander) Philippi. Laing incorrectly cited the author as '(Ellis *et* Solander) Folie'. Further information is provided in the entry for *decussata* below.

decussata

Basionym. *Millepora decussata* Ellis *et* Solander, 1786: 131, pl. 23, fig. 9.

Type locality. Portugal.

Type. Whereabouts uncertain; see comments.

Published illustrations of type material. Ellis & Solander, 1786: pl. 23, fig. 9.

Published records from the New Zealand region. *Lithophyllum decussatum* (Ellis *et* Solander) Philippi, 1837: 389. — Lemmermann, 1907:381 [Cha]. Laing, 1926: 179 [Cha].

Lithothamnion agariciforme f. *decussata* (Ellis *et* Solander) Foslie, 1897b: 5. — Reinbold 1899b: 300 [Cha]. Laing, 1902: 358 [Cha].

Comments. The whereabouts of the material upon which Ellis & Solander (1786) based *Millepora decussata* is unknown. Dixon (1960) was unable to locate the Ellis herbarium and suggested that it should be presumed to be lost.

Woelkerling (1983b: 304-307) noted that most twentieth century authors have presumed *decussata* to be a species of *Lithophyllum*, but the relationship between twentieth century concepts of the species and the original specimens of Ellis & Solander cannot be determined until the latter are located or the species

is neotypified. Chatham Islands specimens referred to *decussata* and to *Lithothamnion lichenoides* f. *heterophylla* Foslie (a superfluous substitute name; see entry for *heterophylla* below) require re-examination to determine their correct identity. Comments on the spurious record of *Lithophyllum decussatum* f. *decumbens* Foslie from the Chatham Islands (Chapman & Parkinson, 1974: 193) are provided under the entry for *decumbens* above.

detrusum

Basionym. *Lithophyllum detrusum* Foslie, 1906a: 21.

Type locality. Island Bay, Wellington, New Zealand.

Lectotype. TRH, Setchell 6350, including slides 1169 & 1170; designated by Adey in Adey & Lebednik (1967: 16).

Published illustrations of type material. Printz, 1929: pl. 53, fig. 18.

Published records from the New Zealand region. *Lithophyllum detrusum* Foslie. — Foslie, 1906a: 9, 21, 22 [Nor]. De Toni, 1924: 673 [Nor]. Laing, 1926: 180 [Nor]. Printz, 1929: pl. 53, fig. 18 [Nor]. Dawson, 1960: 38 [NZ]. Adey & Lebednik, 1967: 16 [Nor]. Adams, 1972: 74 [Nor]. Chapman & Parkinson, 1974: 191, pl. 65A [Nor]. Woelkerling, 1993: 73 [Nor].

Pseudolithophyllum detrusum (Foslie) Adey, 1970: 12. — Adey, 1970: 12 [U].

Comments. The status and disposition of this taxon are uncertain because there is no detailed account of the type in a modern context. Woelkerling (1993: 73) summarized general information on the type, but mistakenly recorded the type locality as the Bay of Islands. Earlier, Adey (1970: 12) had transferred the species into *Pseudolithophyllum* without providing a detailed account. *Pseudolithophyllum* is now considered to be a heterotypic synonym of *Lithophyllum* (Woelkerling, 1988: 103). The nature of possible type material in LD (Chapman & Parkinson, 1974: legend to pl. 65A) requires further investigation.

The species has not been definitely recorded from outside the New Zealand region. Dawson (1960: 38), however, suggested that some specimens from the Pacific coast of Baja California resembled *Lithophyllum detrusum* but cautioned that more extensive collections were required and comparisons with Foslie's original material were needed to effect a definite determination.

endophloea

Basionym. *Schmitziella endophloea* Bornet et Batters, in Batters, 1892: 186.

Type locality. Torquay, England.

Lectotype. BM, unnumbered; designated by L. M. Irvine in Woelkerling & Irvine (1982: 278).

Published illustrations of type material. Woelkerling & Irvine, 1982: fig. 1

Published records from the New Zealand region. *Schmitziella endophloea* Bornet et Batters. Chapman, 1946: 111 (footnote, as *Smitziella*) [NZ].

Comments. Woelkerling & Irvine (1982: 278) determined that Chapman's (1946) New Zealand record of *Schmitziella endophloea* pertained to *S. cladophorae*, a heterotypic synonym of *Melobesia membranacea* (see separate entries for those taxa). *Schmitziella endophloea* and the genus *Schmitziella* have been excluded from the Corallinales (Woelkerling & Irvine, 1982).

engelhartii

Basionym. *Lithothamnion engelhartii* Foslie, 1900: 18.

Type locality. Cape Jaffa, South Australia.

Lectotype. TRH, unnumbered; designated by Adey in Adey & Lebednik (1967: 69).

Published illustrations of type material. Printz, 1929, pl. 7, fig. 14. Woelkerling & A. Harvey, 1993: figs 1, 2.

Published records from the New Zealand region. *Mesophyllum engelhartii* (Foslie) Adey, 1970: 23. — Woelkerling & A. Harvey, 1993: 581, figs 1-11 [Auc, Nor]. Barry & Woelkerling, 1995: 143 [Auc, NZ]. Chamberlain & Keats, 1995: 134, figs 1-35 [Auc]. Woelkerling, 1996a: 193, figs 82, 83 [Auc, NZ]. Huisman, 1997: 209 [NZ].

Comments. Woelkerling & A. Harvey (1993) and Chamberlain & Keats (1995) examined the lectotype and published detailed accounts of the species. General information on the lectotype was summarized by Woelkerling (1993: 84).

In addition to the New Zealand region, *Mesophyllum engelhartii* is confirmed to occur southern and western Australia, South Africa and Namibia (Woelkerling 1996a: 195). According to Woelkerling & A. Harvey (1993: 584), records from Fiji (Chapman 1977; South & Kasahara 1992) have not been verified.

New Zealand region records of two known heterotypic synonyms (*Lithothamnion engelhartii* f. *umbonata* Foslie; *Lithothamnion fumigatum* f. *aucklandicum*) are listed under entries for those taxa.

explanatum

Basionym. *Lithophyllum explanatum* Foslie, 1906a: 25.

Type locality. Island Bay, Wellington, New Zealand.

Lectotype. TRH, Setchell number 6104a; designated by Adey in Adey & Lebednik (1967: 36).

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Lithophyllum explanatum* Foslie — Foslie, 1906a: 17, 25 [Nor]. Foslie, 1907b: 12 [Cha, NZ]. Woelkerling, 1993: 88 [Nor].

Melobesia explanata (Foslie) Foslie, 1908b: 6. — Foslie, 1908b: 6 [NZ]. Laing, 1926: 179 [Nor]. Adey & Lebednik, 1967: 36 [Nor]. Adams, 1972: 73 [Nor].

Heteroderma explanata (Foslie) Foslie, 1909: 56. — De Toni, 1924: 653 [NZ]. Adey, 1970: 16 [U].

Comments. Woelkerling (1993: 88) summarized general information on the type but mistakenly recorded the type locality as the Bay of Islands. The type has not been studied in detail in a modern context, and thus the status and disposition of this taxon are uncertain. The species apparently has not been reported outside the New Zealand region and was not mentioned by Chapman & Parkinson (1974).

farinosa

Basionym. *Melobesia farinosa* Lamouroux, 1816: 315.

Type locality. Mediterranean Sea (precise locality not specified).

Lectotype. CN, unnumbered, Lamouroux herbarium (see Penrose & Chamberlain, 1993: 296).

Published illustrations of type material. Chamberlain, 1983: fig. 19; Penrose & Chamberlain, 1993: figs 1-4.

Published records from the New Zealand region. *Fosliella farinosa* (Lamouroux) Howe, 1920: 587. — Chapman, 1961: 350 [Ker]. Chapman & Parkinson, 1974: 186, pls 64B, 64C [Ker, Nor, Ste, & Ngahauau (unidentifiable locality)]. Nelson & Adams, 1984: 18 [Ker]. Tittley *et al.*, 1984: 63 [NZ].

Comments. Chamberlain (1983, as *Fosliella farinosa* f. *farinosa*) and Penrose & Chamberlain (1993, as *Hydrolithon farinosum*) examined the type and provided detailed accounts of the species, while Penrose (1996a: 260) and Ringeltaube & A. Harvey (2000: 437) provided accounts of the species for southern Australia and for Heron Island (off the eastern Australian coast), respectively. All New Zealand region records require verification.

Chamberlain (1994a) considered the species to be widespread, and Littler & Littler (2003: 30) stated that the species was pantropical. Indian Ocean records were summarized by Silva *et al.* (1996: 236), while Mediterranean records were listed by Babbini & Beressan (1997: 200).

foecundum

Basionym. *Lithothamnion foecundum* Kjellman, 1883: 131, pl. 5, figs 11-19.

Type locality. Kara Sea.

Holotype. UPS, unnumbered.

Published illustrations of type material. Kjellman, 1883: pl. 5, fig. 11; Kjellman, 1885: pl. 5, fig. 11; Chamberlain, 1990: figs 2, 13-16, 30; Düwel & Wegeberg, 1996: figs 4, 34-38; Alongi *et al.*, 2002: figs 9-10.

Published records from the New Zealand region. *Leptophyllum foecundum* (Kjellman) Adey, 1966: 325. — Zaneveld & Sanford, 1980: 224, figs 24 – 28 [Bal]. Alongi *et al.*, 2002: 143, figs 1 – 17 [Bal].

Comments. Chamberlain (1990), Düwel & Wegeberg (1996) and Alongi *et al.* (2002) have published accounts of the type material. Alongi *et al.* (2002: 145) reported that the Balleny Island material of Zaneveld & Sanford (1980) was missing, but they concluded from the published description and illustrations that the Zaneveld & Sanford material belonged to *Phymatolithon foecundum*.

The species has not been recorded elsewhere in the New Zealand region, but it has been reported from other localities in the Antarctic and from various localities in high northern hemisphere latitudes (Alongi *et al.* 2002: 145).

fragile

Basionym. *Pneophyllum fragile* Kützing, 1843: 385.

Type locality. Mediterranean Sea (no further details known).

Holotype. L 941.242 -152.

Published illustrations of type material. Kützing, 1869: pl. 93, figs a-c. Chamberlain, 1983: figs 24-27. Penrose & Woelkerling, 1991: figs 1-8.

Published records from the New Zealand region. *Pneophyllum fragile* Kützing. — Chamberlain, 1994a: 141, figs 64, 65 [NZ].

Comments. Chamberlain (1983) and Penrose & Woelkerling (1991) published detailed accounts of *Pneophyllum fragile*, including the type. General information on the type also was provided by Woelkerling & Verheij (1995: 53) and Woelkerling (1998: 388, fig. 357), and further information on the genus was furnished by Woelkerling (1988: 145 – 150). *P. fragile* is the type species of *Pneophyllum* (Kützing 1843: 385).

The only published New Zealand record under the name *Pneophyllum fragile* is that of Chamberlain (1994a: 141). Woelkerling (1997: 248-249) later found

that the type of *Melobesia leptura* (from Island Bay, Wellington; see separate entry below) was a heterotypic synonym of *Pneophyllum fragile*. Globally, the species appears to be widely distributed (see Chamberlain, 1983: 359-360; Penrose & Woelkerling, 1991: 501; Chamberlain, 1994a: 143).

fumigatum

Basionym. *Lithothamnion fumigatum* Foslie, 1901: 7.

Comments. *Lithothamnion fumigatum* f. *aucklandicum* (see entry above for *aucklandicum*) but not *Lithothamnion fumigatum* f. *fumigatum* has been recorded for the New Zealand region. Both taxa were found (Woelkerling & A. Harvey, 1993: 586) to be heterotypic synonyms of *Mesophyllum engelhartii*.

geppii

Basionym. *Lithothamnion geppii* Lemoine, 1917: 23, figs 1, 2.

Type locality. Spirits Bay, near North Cape, North Island, New Zealand (Terra Nova Expedition 1910-1913, Station 134).

Holotype. BM & PC (see Woelkerling, 1998c: 346).

Published illustrations of type material. Lemoine, 1917: figs 1, 2; Chapman & Parkinson, 1974: text fig. 58; Woelkerling, 1998c: fig. 254.

Published records from the New Zealand region. *Lithothamnion geppii* Lemoine. — Lemoine, 1917: 23, figs 1, 2 [Nor]. De Toni, 1924: 640 [Nor]. Laing, 1926: 180 [Nor]. Chapman & Parkinson, 1974: 199, text fig. 58 [Nor]. Woelkerling, 1998c: 346, fig. 254 [Nor].

Comments. The type has not been studied in a modern context and thus the status and disposition of *Lithothamnion geppii* are uncertain. General information on the type material was provided by Woelkerling (1998c: 346, fig. 254). All published records for the New Zealand region link back to the original account of Lemoine (1917). The species has not been reported from elsewhere.

haptericolum

Basionym. *Lithothamnion haptericolum* Foslie, 1906a: 8.

Type locality. Island Bay, Wellington, New Zealand.

Holotype. TRH, Setchell number 6351, including two slides numbered 1171 and one slide numbered 1172.

Published illustrations of type material. Printz, 1929: pl. 6, fig. 11.

Published records from the New Zealand region. *Lithothamnion haptericolum* Foslie. — Foslie, 1906a: 8 [Nor]. De Toni, 1924: 615 [Nor]. Laing, 1926: 180 [Nor]. Printz, 1929: pl. 6, fig. 11 [Nor]. Adey & Lebednik, 1967: 68 [Nor, NZ]. Adams, 1972: 74 [Nor]. Chapman & Parkinson, 1974: 199, pl. 70B [Nor]. Woelkerling, 1993: 114 [Nor].

Mesophyllum haptericolum (Foslie) Adey, 1970: 24. — Adey, 1970:24 [U].

Comments. The type has not been studied in detail in a modern context, and thus the status and disposition of *Lithothamnion haptericolum* are uncertain. Woelkerling (1993: 114) summarized general information on the type, but mistakenly recorded the type locality as the Bay of Islands. Earlier, Adey (1970: 24) transferred the species into *Mesophyllum* without providing a detailed account. The species apparently has not been reported outside the New Zealand region.

Contrary to information in their figure legend, the specimen illustrated by Chapman & Parkinson (1974; pl. 70B) is probably not type material because it is not the same as the type material illustrated in Printz (1929).

heterophylla

Basionym. *Lithothamnion lichenoides* f. *heterophylla* Foslie, 1900: 13.

Published records from the New Zealand region. *Lithothamnion lichenoides* f. *heterophylla* Foslie. — Foslie, 1900: 13, 14 [Cha]. De Toni, 1905: 1753 [Cha].

Comments. According to Woelkerling (1993: 117), *Lithothamnion lichenoides* f. *heterophylla* Foslie is a superfluous substitute name for *Lithothamnion agariciforme* f. *decussata* (Ellis & Solander) Foslie. See entry for *decussata* for further information.

incisa

Basionym. *Lithothamnion patena* f. *incisa* Foslie, 1906a: 6.

Type locality. Island Bay, Wellington, New Zealand.

Lectotype. TRH, Setchell number 6354; designated by Woelkerling & A. Harvey (1992: 382).

Published illustrations of type material. Woelkerling & A. Harvey, 1992: fig. 1. Woelkerling & A. Harvey, 1993: figs 12 - 14.

Published records from the New Zealand region. *Lithothamnion patena* f. *incisa* Foslie. — Foslie, 1906a: 6, 26 [Nor]. Woelkerling, 1993: 123 [Nor].

Lithothamnion incisum (Foslie) Foslie, 1907b: 12. — Foslie, 1907b: 12 [Cha, NZ]. De Toni, 1924: 615 [Cha, NZ]. Laing, 1926: 180 [Cha]. Printz, 1929: pl. 10, figs 10-13 [Nor]. Adey & Lebednik, 1967: 68 [Nor]. Wilks & Woelkerling, 1995: 563 [NZ].

Mesophyllum incisum (Foslie) Adey, 1970: 24. — Adey, 1970: 24 [U]. Johnson, 1975: 53 [Auc]. Parsons & Fenwick, 1984: 430 [Sou]. Hay *et al.*, 1985: 38 [Sna]. Woelkerling & A. Harvey, 1992: 382, figs 1-36 [Cha, Nor, Sna, Sou]. Woelkerling & A. Harvey, 1993: 587, figs 12-16 [Auc, Cha, NZ, Sna]. Woelkerling, 1996a: 197, figs 62B, 84, 85 [Auc, Cha, NZ, Sna]. Keats & Maneveldt, 1997a: 202, figs 1-19 [Cha, NZ, Sub]. Athanasiadis, 1999: 247 [Auc, Cha, NZ, Nor, Sna]. Huisman, 2000: 56, including one unnumbered figure [NZ].

Polyporolithon patena var. *incisa* (Foslie) Chapman *et* Parkinson, 1974: 202. — Chapman & Parkinson, 1974: 202 [Cha, Nor].

Comments. Woelkerling & A. Harvey (1992, 1993) published detailed accounts of the species, including the lectotype, and Keats & Maneveldt (1997a) provided a further study. Woelkerling (1993: 123) summarized general information on the lectotype. The nature of possible type material in LD (see Chapman & Parkinson, 1974: legend to pl. 73A) requires further investigation. Woelkerling & A. Harvey (1992: 382; 1993: 588), Woelkerling (1993: 123; 1996a: 199), Silva *et al.* (1996: 258), Keats & Maneveldt (1997a: 202) and Huisman (2000: 56) incorrectly listed the type locality as the Bay of Islands, New Zealand.

In addition to the New Zealand region, *Mesophyllum incisum* is confirmed to occur in southern and western Australia (Woelkerling, 1996a: 199) and in southern Africa (Keats & Maneveldt, 1997a: 202).

insigne

Basionym. *Lithothamnion insigne* Foslie, 1906a: 9.

Type locality. Island Bay, Wellington, New Zealand.

Holotype. TRH, Setchell number 6343, including slides 1165 & 1166.

Published illustrations of type material. Printz, 1929, pl. 5, fig. 10.

Published records from the New Zealand region. *Lithothamnion insigne* Foslie. — Foslie, 1906a: 9, 21 [Nor]. De Toni, 1924: 615 [Nor]. Laing, 1926: 180 [Nor]. Printz, 1929: pl. 5, fig. 10 [Nor]. Adey & Lebednik, 1967: 66 [Nor]. Adams, 1972: 74 [Nor]. Chapman & Parkinson, 1974: 197, pl. 69A [Nor]. Woelkerling, 1993: 126 [Nor].

Mesophyllum insigne (Foslie) Adey, 1970: 24. — Adey, 1970: 24 [U]. Johnson, 1975: 53 [Auc].

Comments. The status and disposition of this taxon are uncertain because there is no detailed published account of the type in a modern context. Woelkerling (1993: 126) summarized general information on the type, but mistakenly recorded the type locality as the Bay of Islands. Earlier, Adey (1970: 24) had transferred the species into *Mesophyllum* without providing a detailed account or seeing tetrasporangial conceptacles. The nature of possible type material in LD (Chapman & Parkinson, 1974: legend to pl. 69A) requires further investigation.

The species apparently has been reported only from the New Zealand region.

jugatum

Basionym. *Lithophyllum jugatum* Foslie, 1906a: 26.

Type locality. Island Bay, Wellington, New Zealand.

Holotype. TRH, Setchell number 6039, including slide 1143 and one unnumbered slide.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Lithophyllum jugatum* Foslie. — Foslie, 1906a: 26 [Nor]. Laing, 1926: 180 [Nor]. Adey & Lebednik, 1967: 16 [Nor]. Adams, 1972: 74 [Nor]. Woelkerling, 1993: 132 [Nor].

Heteroderma ? *jugatum* (Foslie) De Toni, 1924: 653. — De Toni, 1924: 653 [Nor]. Chapman & Parkinson, 1974: 193 [Nor].

Pseudolithophyllum jugatum (Foslie) Adey, 1970: 13. — Adey, 1970: 13 [U].

Comments. The status and disposition of this taxon are uncertain because there is no detailed published study of the type in a modern context. Adey (1970: 13) transferred the species into *Pseudolithophyllum* without providing a detailed account. *Pseudolithophyllum* is now considered to be a heterotypic synonym of *Lithophyllum* (Woelkerling, 1988: 103). Chapman & Parkinson (1974: 192, 193) listed *jugatum* as a *species inquirenda*. General information on the type was summarized by Woelkerling (1993: 132), who mistakenly recorded the type locality as Bay of Islands.

The species apparently has not been recorded outside the New Zealand region.

kotschyanum

Basionym. *Lithophyllum kotschyanum* Unger, 1858: 22.

Type locality. Gulf of Bahrain, Persian Gulf.

Holotype. TRH, unnumbered, includes slide 1720.

Published illustrations of type material. Unger, 1858: pl. 5, figs 15, 16. Printz, 1929: pl. 65, fig. 1.

Published records from the New Zealand region. *Lithophyllum kotschyanum* Unger. — Adey & Lebednik, 1967: 41 [Cha].

Comments. Foslie (1909: 34) examined the type of *Lithophyllum kotschyianum*, but he did not mention secondary pit-connections and did not provide details of tetrasporangial conceptacle roof anatomy. Thus, the type requires further study to confirm that it belongs to *Lithophyllum* and to determine what its diagnostic features are at species level. Woelkerling (1993: 133) summarized general information on the type.

The single New Zealand region record of this species (Adey & Lebednik, 1967: 41) was based on a Schauinsland specimen in the Foslie herbarium sent by Reinbold. Foslie made no mention of the Chatham Islands specimen in publication, but it is likely to be the specimen listed as *Lithothamnion* sp. by Reinbold (1899b: 300). The specimen requires re-examination in a modern context.

Elsewhere, several detailed accounts of presumed *Lithophyllum kotschyianum* have appeared (e.g. Gordon *et al.*, 1976: 267, pl. 9, figs 5, 6 & pl. 10, figs 1, 2; Adey *et al.*, 1982: 37, figs 23 – 25; Cribb, 1983: 49, pl. 53, figs 1 - 2), but none involved a detailed study of the type. Chamberlain (1997: 96) suggested that the species was pan-tropical, while Littler & Littler (2003: 36) stated the species occurred in the tropical Pacific, Australia, the Indian Ocean, and the Red Sea. All records of occurrence require re-evaluation once a full study of the type has been published.

leptura

Basionym. *Melobesia leptura* Foslie, 1906a: 16.

Type locality. Island Bay, Wellington, New Zealand.

Lectotype. TRH, Setchell number 6105a; designated by Adey *in* Adey & Lebednik (1967: 35).

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Melobesia leptura* Foslie. — Foslie, 1906a: 16, 26 [Nor]. Foslie, 1907b: 12 [Cha, NZ]. De Toni, 1924: 648 [NZ]. Laing, 1926: 179 [Nor]. Cranwell & Moore, 1935: 313 [Nor]. Levring, 1945: 15 [Cam, NZ, Ste]. Papenfuss, 1964: 32 [Cam]. Adey & Lebednik, 1967: 35 [Nor]. Adams, 1972: 74 [Nor]. Chapman & Parkinson, 1974: 188 [Nor]. South & Adams, 1976: 42. [Sou]. Hay *et al.*, 1985: 38 [Cam]. Wilks & Woelkerling, 1991: 528 [Nor]. Woelkerling, 1993: 137 [Nor].

Heteroderma leptura (Foslie) Foslie, 1909: 56. — Adey, 1970: 16 [U]. Zaneveld & Sanford, 1980: 212, figs 6, 7 [Cam, NZ, Ste].

Comments. Woelkerling (1997: 248-249) concluded from a comparison of relevant types that *Melobesia leptura* was a heterotypic synonym of *Pneophyllum fragile*. General information on the type was provided by Woelkerling (1993: 137), who mistakenly recorded the type locality as the Bay of Islands. All New Zealand records of *leptura* require re-assessment.

melobesioides

Basionym. *Mastophora melobesioides* Foslie, 1903b: 24.

Type locality. South Nilandu, Maldive Islands.

Lectotype. TRH, unnumbered; designated by Foslie (1904b: 74).

Published illustrations of type material. Foslie, 1904b: text figs 30A, 31A. Printz, 1929: pl. 73, fig. 1. Turner & Woelkerling, 1982a: fig. 2.

Published records from the New Zealand region. *Lithoporella melobesioides* (Foslie) Foslie, 1909: 59. — Nelson & Adams, 1984: 18 [Ker]. Woelkerling, 1996b: 253 [Ker].

Comments. Turner & Woelkerling (1982a, 1982b) published a detailed account of *Lithoporella melobesioides*, including the type. General information on the type was summarized by Woelkerling (1993: 148), and further information on the genus was provided by Woelkerling (1988: 124 – 128). *L. melobesioides* is the type species of *Lithoporella* (Foslie 1909: 58).

In the New Zealand region, *Lithoporella melobesioides* has been reported only from the Kermadec Islands; this record requires confirmation. Outside the New Zealand region, the species has been reported from various areas (summarized by Woelkerling, 1996b: 253; also see Silva *et al.*, 1996: 251), but, according to Woelkerling (1996b: 253), most records require confirmation.

membranacea

Basionym. *Corallina membranacea* Esper, 1796: pl. Corallina XII.

Type locality. France (more precise locality unknown).

Neotype. CN, Lamouroux herbarium, unnumbered; designated by Chamberlain (1985: 677).

Published illustrations of type material. Chamberlain, 1985: figs 2-4. Wilks & Woelkerling, 1991: figs 1-5.

Published records from the New Zealand region. *Melobesia membranacea* (Esper) Lamouroux, 1812: 186. — Woelkerling & Irvine, 1982: 290 [Ste]. Nelson & Adams, 1984: 18 [Ker]. Chamberlain & Irvine, 1994b: 196, figs 7B, 39A, 75, 93, 94 [NZ].

Schmitziella cladophorae Chapman. — See records under entry for *cladophorae*.

Comments. Chamberlain (1985) and Wilks & Woelkerling (1991) published accounts of the neotype. The neotype of *Corallina membranacea* is also the type of the genus *Melobesia*. The genus *Corallina* Linnaeus (1758: 646, 805) is characterized by the presence of genicula, while *Melobesia* Lamouroux (1812: 186) is characterized by the absence of genicula (e.g., see Woelkerling, 1988: 186-191; Womersley, 1996). The placement by Esper (1796) of the non-geniculate species *membranacea* in *Corallina* is the only instance known to the present authors where geniculate and non-geniculate species were grouped under the same generic name.

Woelkerling & Irvine (1982: 290) examined the New Zealand type of *Schmitziella cladophorae* Chapman (1951: 84) (see separate entry above) and concluded that it was a heterotypic synonym of *Melobesia membranacea*.

Outside the New Zealand region, *Melobesia membranacea* is widely recorded, but most reports require confirmation. Recent detailed accounts include those of Wilks & Woelkerling (1991) and Woelkerling (1996a) for southern Australia, and Chamberlain & Irvine (1994b) for the British Isles.

mesomorphum

Basionym. *Lithothamnion mesomorphum* Foslie, 1901: 5.

Type locality. Bermuda (more precise locality not indicated).

Holotype. TRH, Farlow number XI, including slides 485 & 840.

Published illustrations of type material. Printz, 1929: pl. 9, figs 7 – 8. Athanasiadis, 1999: figs 18, 19.

Published records from the New Zealand region. *Mesophyllum mesomorphum* (Foslie) Adey, 1970: 25. — Nelson & Adams, 1984: 18 [Ker].

Comments. Athanasiadis (1999: 246, figs 18, 19) published data on the type (received from Y. Chamberlain) and concluded that it represented a distinct species of *Mesophyllum*. Earlier, Woelkerling (1993: 148) had summarized general information on the type.

In addition to the Kermadec Islands, the species has been reported from the Indian Ocean (Silva *et al.*, 1996: 258), Korea (Lee & Kang, 2001: 426), China (Zhang & Zhou, 1980: 71, figs 1 – 3), Guam (Gordon *et al.*, 1976: 252, pl. 2, figs 1 – 3), tropical eastern Australia (Cribb, 1983: 50, pl. 46, fig 2), Hawaii (Magruder & Hunt, 1979: 85, one unnumbered figure) and the tropical and subtropical western Atlantic Ocean (Taylor, 1960: 382; Littler & Littler, 2000: 34, one unnumbered figure). All records require confirmation.

monostromaticum

Basionym. *Lithothamnion monostromaticum* Foslie, 1903a: 3.

Type locality. New Zealand (more precise locality unknown).

Holotype. TRH, unnumbered, including two unnumbered slides.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Lithothamnion monostromaticum* Foslie. — Foslie, 1903a: 3 [NZ]. Foslie, 1904a: 4 [NZ]. De Toni, 1905: 1759 [NZ]. Woelkerling, 1993: 153 [NZ]. Silva *et al.*, 1996: 251 (see note under *Lithoporella melobesioides*) [NZ].

Heteroderma monostromaticum (Foslie) Adey, 1970: 16. — Adey, 1970: 16 [U].

Comments. The status and disposition of this taxon are uncertain because there is no detailed account of the type in a modern context. Woelkerling (1993: 153) summarized general information on the type. Earlier, Adey (1970: 16) had transferred the species with some question into *Heteroderma* without providing a detailed account of the type. *Heteroderma* is now considered to be a heterotypic synonym of *Pneophyllum* (Chamberlain, 1983: 353; Woelkerling, 1988: 147).

The species apparently has not been reported outside the New Zealand region.

muelleri

Basionym. *Lithothamnion muelleri* Lenormand *ex* Rosanoff, 1866: 101, pl. 6, figs 8-11.

Type locality. Western Port Bay, Victoria, Australia.

Lectotype. CN, Lamouroux herbarium, unnumbered; designated by Woelkerling (1983a: 193).

Published illustrations of type material. Woelkerling, 1983a: figs 29 - 33; Wilks & Woelkerling, 1995: figs 1A, 1B, 2A.

Published records from the New Zealand region. *Lithothamnion muelleri* Lenormand *ex* Rosanoff. — Lemoine, 1913: 4, 24, 25 [NZ]. Ramírez & Santelices, 1991: 215 [NZ].

Comments. Wilks & Woelkerling (1995) published a detailed account *L. muelleri*, including the type, and Woelkerling (1996a: 181-183) provided further information. The lectotype of *L. muelleri* is also the type of the genus *Lithothamnion* Heydrich, *nom. cons.*

The New Zealand records of Lemoine (1913) and Ramírez & Santelices (1991) require confirmation. Outside New Zealand, *Lithothamnion muelleri* is known with certainty from southern Australia (Woelkerling 1996a: 183). Accord-

ing to Mendoza (1999: 141), records from Tierra del Fuego (summarized by Woelkerling, 1996a: 183; also see Ramírez & Santelices, 1991: 215) are spurious.

novae-zeelandiae

Basionym. *Lithothamnion novae-zeelandiae* Heydrich, 1897a: 63, pl. 3, figs 6, 7.

Type locality. Bay of Islands, New Zealand.

Syntype material. TRH, Heydrich number 1, including slides 88, 89, and 1629.

Published illustrations of type material. Heydrich, 1897a: pl. 3, figs 6, 7. Printz, 1929: pl. 17, figs 26, 27. Chapman & Parkinson, 1974: pl. 67B.

Published records from the New Zealand region. *Lithothamnion novae-zeelandiae* Heydrich. — Heydrich, 1897a: 63 [Nor]. Foslie, 1897a: 259 [Nor]. Laing, 1926: 179 [NZ]. Printz, 1929: pl. 17, figs 26-27 [Nor]. Adey & Lebednik, 1967: 82 [Nor]. Chapman & Parkinson, 1974: 195, pls 67A, 67B [Nor, Ste]. Woelkerling, 1993: 159 [Nor].

Comments. The status and disposition of this taxon are uncertain. Heydrich (1897a: 63) based *Lithothamnion novae-zeelandiae* on material from the Bay of Islands but did not designate a type. Heydrich's herbarium was bequeathed to the Botanischen Museums zu Berlin-Dahlem in 1911 (see Urban, 1916: 141 and Lamy & Woelkerling, 1998: 120-122) and subsequently was destroyed with other algal collections during World War II (Hiepko, 1987: 230). The only known syntype material is in TRH (Woelkerling, 1993: 159), but it has not been examined in detail in a modern context. According to Heydrich (1897a: 63), the original material was sterile. It is unclear whether the specimens depicted in the protologue are the same as those depicted in Printz (1929). The specimens depicted in Chapman & Parkinson (1974), however, match those depicted in Printz (1929).

Lithothamnion novae-zeelandiae apparently has not been recorded from elsewhere.

novae-zeelandiae

Basionym. *Melobesia novae-zeelandiae* Heydrich, 1897a: 43.

Type locality. Bay of Islands, New Zealand.

Type. Probably destroyed; see comments.

Published illustrations of type material. Apparently none.

Published records from the New Zealand region. *Melobesia novae-zeelandiae* Heydrich. — Heydrich, 1897a: 43 [Nor]. De Toni, 1905: 1767 [NZ]. De Toni, 1924: 648 [NZ]. Cassie, 1971: 95 [NZ]. Adams, 1972: 74 [Nor]. Chapman & Parkinson, 1974: 187 [see comments]. Nelson & Adams, 1987: 30 [Nor]. Nelson & Phillips, 1996: 561 [Nor].

Comments. The whereabouts of any original Heydrich material of *Melobesia novae-zeelandiae* is unknown, and thus the status and disposition of this species are uncertain. Heydrich (1897a: 43) based *Melobesia novae-zeelandiae* on specimens growing on bryozoans, the green alga *Cladophora*, and other algae from the Bay of Islands but did not designate a type. Heydrich's herbarium was bequeathed to the Botanischen Museums zu Berlin-Dahlem in 1911 (see Urban, 1916: 141; Lamy & Woelkerling, 1998: 120-122), but was subsequently destroyed with other algal collections during World War II (Hiepko, 1987: 230).

Chapman & Parkinson (1974: 187) listed *Melobesia novae-zeelandiae* as a heterotypic synonym of *Hydrolithon farinosum* (as *Fosliella farinosa*) without sup-

porting evidence. *Melobesia novae-zeelandiae* has not been reported from elsewhere.

patena

Basionym. *Melobesia patena* Hooker *et* Harvey, *in* Harvey, 1849: 111, pl. 40 (lower left).

Type locality. Flat Point (near Castlepoint), New Zealand.

Lectotype. TCD, Colenso 1331; designated and depicted by Chapman & Parkinson (1974: pl. 72).

Published illustrations of type material. Chapman & Parkinson, 1974: pl. 72. Ricker, 1987: fig. 73d. May & Woelkerling, 1988: figs 1, 4-7, 23, 26, 27.

Published records from the New Zealand region. *Melobesia patena* Hooker *et* Harvey. — Harvey, 1849: 111, pl. 40 (lower left) [NZ]. Areschoug, 1852: 514 [NZ]. Harvey, 1855a: 238 [NZ]. Harvey, 1863: xxx [NZ]. Harvey, 1867: 681 [NZ]. Reinbold, 1899b: 300 [Cha]. Laing, 1902: 358 [Cha]. Wilks & Woelkerling, 1991: 528 [Sou].

Mastophora patena (Hooker *et* Harvey) Kützing, 1858: 47. — Kützing, 1858: 47, pl. 99, fig. 3 [NZ].

Lithophyllum patena (Hooker *et* Harvey) Rosanoff, 1866: 88. — Barton, 1893: 202 [NZ].

Lithothamnion patena (Hooker *et* Harvey) Heydrich, 1897b: 413 — Heydrich, 1901: 542 [Nor]. Cotton, 1907: 43 [Cha, NZ]. Gain, 1912: 141 [Auc]. Lemoine, 1912: LVI [Auc]. Lemoine, 1913: 4, 31 [Auc, NZ]. Lemoine, 1915b: 194, pl. 9, fig. 1 [Auc, NZ]. Mazza, 1916-1922: 1100 [NZ]. Mazza, 1917: 104 [NZ]. Lemoine, 1920: 11, 15 [Auc, NZ]. Skottsberg, 1923: 65 [Auc, NZ]. De Toni, 1924: 622 [Auc, NZ]. Laing, 1926: 181 [Auc, Cha, NZ]. Levring, 1945: 15 [Auc, Cam, Cha, NZ]. Levring, 1960: 36 [Auc, Cam, Cha, NZ]. Adey & Lebednik, 1967: 69 [NZ]. Wilks & Woelkerling, 1995: 564 [NZ].

Lithothamnion lichenoides f. patena (Hooker *et* Harvey) Foslie, 1898: 7. — Lemmermann, 1907: 380 [Cha]. De Toni, 1905: 1752 [NZ].

Lithothamnion lichenoides var. *patena* (Hooker *et* Harvey) Foslie *ex* De Toni *et* Forti, 1922: 59. — De Toni & Forti, 1922: 59 [Auc, Cha, NZ]. Lucas & Perrin, 1947: 390 [NZ].

Polyporolithon patena (Hooker *et* Harvey) Mason, 1953: 317. — Papenfuss, 1964: 32 [Auc, Cam]. Adams, 1972: 74 [Nor]. Adams *et al.*, 1974: 218 [Ste]. Chapman & Parkinson, 1974: 201, pl. 72 [Auc, Cam, Cha, Nor, Sou]. South & Adams, 1976: 42. [Sou].

Synarthrophyton patena (Hooker *et* Harvey) Townsend, 1979: 222. — Townsend, 1979: 252, figs 1-18 [Auc, Cam, Cha, NZ]. Meneses & Ramírez, 1984: 68, figs 1-12. [Auc, NZ]. Tittley *et al.*, 1984: 61, 63 [Auc, NZ]. Hay *et al.*, 1985: 39 [Ant, Auc, Cam]. Woelkerling & Foster, 1989: 58 [Cha]. Nelson *et al.*, 1991: 32. [Cha]. Ramírez & Santelices, 1991: 225 [Auc, Cam, Cha, NZ]. J. Millar & Kraft, 1993: 114 [NZ]. Adams, 1994: 160, pl. 55 (centre right) [Ant, Auc, Cam, Cha, Nor, Sou, Ste]. A. Harvey *et al.*, 1994: 335, figs 1-24 [Cha, NZ]. Mendoza *et al.*, 1996: 72 [NZ]. Woelkerling, 1996a: 207, pl. 3, fig. 3; text figs 90, 91 [Cha, NZ]. Neale & Nelson, 1998: 109 [Sou]. Miller *et al.*, 2000: 11 [Nor]. Nelson *et al.*, 2002: 137 [Sou]. Wiencke & Clayton, 2002: 53 [NZ].

Mesophyllum patena (Hooker *et* Harvey) Ricker, 1987: 173. — Ricker, 1987: 173, fig. 73 [Sou]. Woelkerling & A. Harvey, 1993: 599 [NZ].

Comments. The lectotype of *Melobesia patena* is also the type of the genus *Synarthrophyton* Townsend. Detailed accounts of *S. patena* include those of

Townsend (1979), May & Woelkerling (1988), and A. Harvey *et al.* (1994). May & Woelkerling (1988) provided a detailed account of the lectotype collection.

Outside the New Zealand region, *Synarthrophyton patena* has been recorded from southern and south-eastern Australia, South Africa and subantarctic regions (A. Harvey *et al.*, 1994: 333-335), including Tierra del Fuego (Mendoza, 1999: 141).

pustulatum

Basionym. *Melobesia pustulata* Lamouroux, 1816: 315.

Type locality. France.

Lectotype. CN, Lamouroux herbarium, unnumbered; designated by Woelkerling *et al.*, 1985: 325.

Published illustrations of type material. Lamouroux, 1816, pl. 12, fig. 2; Woelkerling *et al.*, 1985: figs 29-39; Woelkerling & Campbell, 1992: Figs 50A-C.

Published records from the New Zealand region. *Lithophyllum pustulatum* (Lamouroux) Foslie, 1904c: 8. — Bergquist, 1960: 87, 88 [Nor].

Comments. Woelkerling *et al.* (1985: 325-327) published a detailed account of the lectotype, while accounts of the species in southern Australia and in the British Isles were provided by Woelkerling & Campbell (1992: 78-95, as *Lithophyllum*) and Chamberlain 1991: 26-66, as *Titanoderma*) respectively. The single record of *Lithophyllum pustulatum* from the New Zealand region requires confirmation.

Elsewhere, *Lithophyllum pustulatum* appears to be widespread, but many records may involve misidentifications (Chamberlain, 1991, as *Titanoderma*; Woelkerling & Campbell, 1992, as *Lithophyllum*). Littler & Littler (2003: 50, as *Titanoderma*) stated that the species was pantropical.

repandum

Basionym. *Lithothamnion repandum* Foslie, 1904a: 4.

Type locality. Half Moon Bay, Port Phillip Bay, Victoria, Australia.

Lectotype. TRH, unnumbered; designated by Adey *in Adey* & Lebednik (1967: 83), includes slides 358 & 516.

Published illustrations of type material. Printz, 1929: pl. 1, fig. 10. Wilks & Woelkerling, 1994: fig. 1.

Published records from the New Zealand region. *Lithothamnion repandum* Foslie. — Adams, 1972: 74 [Nor]. Adams *et al.*, 1974: 219 [Ste].

Phymatolithon repandum (Foslie) Wilks *et* Woelkerling, 1994: 190. — Wilks & Woelkerling, 1994: 190, figs 1-10 [NZ]. Woelkerling, 1996a: 187, pl. 3, fig. 4; text figs 80, 81 [NZ].

Comments. Woelkerling (1993: 189) summarized general information on the type, while Wilks & Woelkerling (1994, as *Phymatolithon*) provided a detailed account of the species, including the type, and concluded that *Lithothamnion repandum* f. *asperulum* was a heterotypic synonym of *Phymatolithon repandum*. New Zealand region records for *asperulum* are listed separately above.

Outside the New Zealand region, *Phymatolithon repandum* has been confirmed to occur in southern Australia (Woelkerling, 1996a: 191). Records from Micronesia (Gordon *et al.*, 1976: 254, as *Lithothamnion asperulum*) and Macquarie Island (Zaneveld & Sanford, 1980: 222, as *Leptophytum asperulum*) have not been verified, and Ricker (1987: 169-170) stated that some of Zaneveld & Sanford's (1980) identifications are dubious.

rhizomae

Basionym. *Lithophyllum rhizomae* Heydrich, 1897a: 51, pl. 3, fig. 4.

Type locality. Bay of Islands, New Zealand.

Type. Probably destroyed; see comments.

Published illustrations of type material. Heydrich, 1897a: pl. 3, fig. 4.

Published records from the New Zealand region. *Lithophyllum rhizomae* Heydrich. — Heydrich, 1897a: 51, pl. 3, fig. 4.

Comments. The whereabouts of any original Heydrich material of *Lithophyllum rhizome* is unknown, and thus the status and disposition of this species are uncertain. Heydrich (1897a: 51) based the species on material growing on *Carpophyllum* and on small mussels, but did not designate a type. Heydrich's herbarium was bequeathed to the Botanischen Museums zu Berlin-Dahlem in 1911 (see Urban, 1916: 141 and Lamy & Woelkerling, 1998: 120-122) and subsequently was destroyed with other algal collections during World War II (Hiepkö, 1987: 230). De Toni (1924: 615; also see Foslie, 1908c: 271) suggested that it was moderately different from *Lithothamnion haptericulum* Foslie (see separate entry above), but without comparing relevant types.

The species apparently has not been recorded outside the New Zealand region.

schielianum

Basionym. *Synarthrophyton schielianum* Woelkerling et Foster, 1989: 40, figs 1-35.

Type locality. Waihere Bay, Pitt Island, Chatham Islands.

Holotype. WELT A17854.

Published illustrations of type material. Woelkerling & Foster, 1989: figs 1B, 3 – 5, 7 – 14, 21 – 23, 34, 35.

Published records from the New Zealand region. *Synarthrophyton schielianum* Woelkerling et Foster. — Woelkerling & Foster, 1989: 40, figs 1-35 [Cha]. Nelson et al., 1991: 32 [Cha]. Woelkerling, 1996a: 207 [Cha]. Keats & Maneveldt, 1997b: 465 [Cha]. Nelson et al., 1998: 72 [Cha]. Nelson et al., 2002: 137 [Sou].

Comments. *S. schielianum* is known only from the New Zealand region. Keats & Maneveldt (1997b: 448-449) have provided a tabular comparison of a number of species of *Synarthrophyton*, including *S. schielianum*.

thuretii

Basionym. *Melobesia thuretii* Bornet, in Thuret et Bornet, 1878: 96, pl. 50, figs 1-8.

Type locality. Pointe de Querqueville, France (Woelkerling, 1998c: 381).

Lectotype. PC, unnumbered, Thuret-Bornet Herbarium (algal fascicle 130, filed under *Choreonema*); designated by Woelkerling (1987: 113).

Published illustrations of type material. Woelkerling, 1987: figs 1-5. Woelkerling, 1998c: fig. 341.

Published records from the New Zealand region. *Melobesia thuretii* Bornet, in Thuret & Bornet, 1878: 96. — Thuret & Bornet, 1878: 99 [NZ].

Choreonema thuretii (Bornet) Schmitz, 1889: 455. — Heydrich, 1897a: 43 [NZ]. Minder, 1910: 7 [NZ]. Lemoine, 1912: LIII [Nor]. Lemoine, 1915a: 26 [NZ]. De Toni & Forti, 1922: 58 [Nor]. Laing, 1926: 179 [Nor]. Adams, 1972: 74 [Nor]. Adams et al., 1974: 219 [Ste]. Chapman & Parkinson, 1974: 170, text fig. 53.

South & Adams, 1976: 41 [Sou]. Woelkerling, 1987: 111 *et seq.*, figs 1-25 [NZ]. Nelson & Adams, 1984: 18 [Ker]. Huisman & Walker, 1990: 411 [NZ]. Nelson *et al.*, 1991: 31 [Cha]. Adams, 1994: 160 [Cha, Nor, Sou, Ste].

Comments. Bornet (*in* Thuret & Bornet, 1878) based *Melobesia thuretii* on material from France and New Zealand but did not designate a type, list locality details, or list the specimens examined in the protologue. Subsequently, Woelkerling (1987) lectotypified the species with one of the French collections in the Thuret Bornet herbarium and provided an account of the material. The single New Zealand collection in the Thuret-Bornet Herbarium was gathered by Filhol (see Lamy & Woelkerling, 1998: 200) at Lyall Bay (Wellington). Additional information on the lectotype was provided by Woelkerling (1998c: 381), and more recent morphological accounts of the species include those of Chamberlain & Irvine (1994c) and Broadwater *et al.* (2002). Most New Zealand records require confirmation.

Choreonema thuetii is known from Europe, Asia, Africa, North America, South America, Australia and New Zealand (Woelkerling, 1988: 91); Indian Ocean records were summarized by Silva *et al.* (1996: 230).

tuberculatum

Basionym. *Lithophyllum tuberculatum* Foslie, 1906a: 21.

Type locality. Island Bay, Wellington, New Zealand.

Syntype material. TRH, Setchell numbers 6340, 6342, 6344, 6345, 6349, including slides 1136-1138, 1140, 1162 – 1164, and 1183.

Published illustrations of syntype material. Printz, 1929: pl. 54, figs 2, 3.

Published records from the New Zealand region. *Lithophyllum tuberculatum* Foslie. — Foslie, 1906a: 9, 21 [Nor]. De Toni, 1924: 672 [Nor]. Laing, 1926: 180 [Nor]. Printz, 1929: pl. 54, figs 2-3 [Nor]. Adey & Lebednik, 1967: 18 [Nor]. Adams, 1972: 74 [Nor]. Chapman & Parkinson, 1974: 192, pl. 65B [Nor].

Pseudolithophyllum tuberculatum (Foslie) Adey, 1970: 14. — Adey, 1970: 14 [U].

Comments. Foslie (1906a: 21) based *Lithophyllum tuberculatum* on a series of Setchell collections from Island Bay near Wellington but did not designate a type. Woelkerling (1993: 227), who mistakenly listed the type locality as the Bay of Islands, provided general information on the syntypes in TRH and noted that formal lectotypification is required. The syntype material has not been studied in detail in a modern context and thus the status and disposition of this species are uncertain.

Adey (1970: 13) transferred the species into *Pseudolithophyllum* without providing a detailed account of type material. *Pseudolithophyllum* is considered to be a heterotypic synonym of *Lithophyllum* (Woelkerling, 1988: 103). The nature of possible type material in LD (Chapman & Parkinson, 1974: legend to pl. 65B) requires further investigation.

The species apparently has been reported only from the New Zealand region.

umbonata

Basionym. *Lithothamnion engelhartii* f. *umbonata* Foslie, 1900: 18.

Type locality. Cape Jaffa, South Australia.

Lectotype. TRH, unnumbered, including slide 351 (designated by Woelkerling, 1993: 230).

Published illustrations of type material. Printz, 1929: pl. 7, fig. 15.

Published records from the New Zealand region. *Lithothamnion engelhartii* f. *umbonata* Foslie. — Chapman & Parkinson, 1974: 200, pl. 71B [Nor].

Comments. Woelkerling & A. Harvey (1993: 586) concluded from a study of relevant type material that *Lithothamnion engelhartii* f. *umbonata* was a heterotypic synonym of *Mesophyllum engelhartii* (Foslie) Adey (f. *engelhartii*), the type form of the species. Chapman & Parkinson (1974: 201) incorrectly stated that f. *umbonata* was based on New Zealand material. The nature of possible type material in LD (Chapman & Parkinson, 1974: legend to pl. 71B, plate number erroneously given as 21) requires further investigation.

verrucata

Basionym. *Melobesia verrucata* Lamouroux, 1816: 316.

Type locality. Mediterranean Sea.

Holotype. CN, Lamouroux herbarium, unnumbered.

Published illustrations of type material. Chamberlain, 1986: figs 4-10.

Published records from the New Zealand region. *Melobesia verrucata* Lamouroux. — Dickie, 1876: 45 [Auc, NZ].

Comments. The type collection of *Melobesia verrucata* was first studied in detail by Chamberlain (1986). Subsequently, Chamberlain (1991: 61) concluded that *Melobesia verrucata* was conspecific with *Lithophyllum pustulatum* (as *Titanoderma*) and represented a distinct variety whose correct varietal name was *canellatum* [i.e. *Titanoderma pustulatum* var. *canellatum* (Kützing) Chamberlain]. Although Chamberlain was able to distinguish four varieties of *pustulatum* in the British Isles, Woelkerling & Campbell (1992: 92) found greater infraspecific variability in southern Australian plants of *pustulatum*, and this precluded the recognition of individual varieties.

The specimens upon which Dickie based his New Zealand record require re-examination to determine their true identity. Papenfuss (1964: 30), without examining relevant specimens, listed the record of Dickie as *Melobesia verrucata* sensu Dickie under *Lithothamnion antarcticum* (Hooker et W. H. Harvey in Harvey et Hooker) Heydrich, thus suggesting that Dickie had misidentified his material. May & Woelkerling (1988: 68-9) concluded that the type of *L. antarcticum* (see separate entry above) was conspecific with *Synarthrophyton patena* (see separate entry above).

DISCUSSION: SUMMARY ANALYSIS

Although 34 names of geniculate Corallinales and 46 names of non-geniculate Corallinales have been recorded from the New Zealand region, the actual number of species and genera present is uncertain and will continue to remain so until detailed monographic studies based on a substantial, co-ordinated program of collecting are undertaken. How many of the 80 names previously used for the New Zealand region taxa can correctly be applied to specimens from that region also remains uncertain as does the number of species present but so far undetected.

The poor representation of coralline specimens in New Zealand herbaria (Nelson *et al.*, 2002: 123; unpublished data) attests to the absence of a concentrated

program of collection and to the challenges hitherto encountered in placing reliable names on samples. Many of the specimens in New Zealand herbaria remain unidentified (personal observations), and most specimens previously identified to species require re-assessment in the context of current knowledge.

It is impossible to reliably identify New Zealand region specimens to species using past New Zealand publications. The keys in Chapman & Parkinson (1974) are incomplete and factually inaccurate, include criteria that are unreliable, are not based on original research, and are taxonomically out of date, thus yielding misleading, incorrect, or inconclusive results. The 11 regional species lists produced from 1972 onwards (Adams, 1972; Adams *et al.*, 1974; South & Adams, 1976; Nelson & Adams, 1984; Adams & Nelson, 1985; Hay *et al.*, 1985; Nelson & Adams, 1987; Nelson *et al.*, 1991; Nelson *et al.*, 1992; Neale & Nelson, 1998; Nelson *et al.*, 2002) lack keys. These lists, however, are linked to voucher specimens which therefore can be reassessed when monographic studies are carried out. The illustrated guide of Adams (1994) includes synopses to some genera of geniculate corallines (p. 156) and to several genera of non-geniculate corallines (p. 160), but no species keys are included. Moreover, Adams (1994: 156, 160) has warned that the nomenclature is confused and includes a number of incorrect or superfluous names for geniculate corallines, and that for many non-geniculate corallines, '...any attempts to name the local species would be both premature and unsatisfactory'.

The present catalogue provides a summary of past published records of coralline red algae for the New Zealand region, but it is clear from parallel work in southern Australia (Woelkerling, 1997) that it would be highly misleading to interpret this summary as an accurate record of the **actual** species biodiversity of Corallinales for the New Zealand region. In a comparison of southern Australian coralline species databases prior to and after monographic studies, Woelkerling (1997) found that only 29.7 % of the species in the pre-monographic database actually were confirmed to occur, and that the remaining 70.3 % involved spurious records, or were heterotypic synonyms of other taxa, or were taxa of uncertain status. Moreover, the total number of species present in southern Australia was reduced from 101 in the pre-monographic database to 56 in the post-monographic data base, and half of the species included in the post-monographic database were not realized to be present in southern Australia prior to the onset of monographic studies.

It is difficult to predict the extent to which the baseline summary provided here will change as a consequence of more comprehensive collecting and monographic studies, but if the Australian experience is any indication, the changes are likely to be substantial. Some facts and conclusions, however, do emerge now from an analysis of the baseline data.

Of the 80 names of species and infraspecific taxa recorded from the New Zealand region, one (*Jania intermedia*) can be eliminated from further consideration because it lacks a description and thus is not validly published (ICBN, Arts 6.2; 32.1). A second name, *Lithophyllum lichenoides* f. *heterophylla*, is nomenclaturally superfluous (Woelkerling, 1993: 117) and thus illegitimate (ICBN Art. 52.1).

The remaining 78 names appear to be both validly published and legitimate (ICBN, Art. 6.5). The correct application of these names to species and infraspecific taxa, however, is linked to an understanding of the type material and to the provisions of the ICBN (Greuter *et al.*, 2000). Of the 78 names, 29 (37%) are based on type material collected from New Zealand region localities while 49 (63%) are based on type material collected from localities outside the New Zealand region. Tables 2-5 provide summaries of the current situation for these taxa.

There are no detailed published accounts in a modern context of type material for any of the seven geniculate taxa based on collections from the New Zealand region (Table 2). This means that the application of these names to specimens has been based solely on tradition and that the nomenclature of these names has lacked the foundation that is essential to stability (see Woelkerling *et al.*, 1985: 317; Woelkerling, 1988: 2-3; Woelkerling, 1998a: 12-13). It also means that the status of these taxa as distinct species or infraspecific taxa is surrounded by uncertainty. Womersley & Johansen (1996: 307, 317) have suggested that in southern Australia, specimens identified as *Jania crassa* are almost certainly conspecific with those identified as *J. verrucosa*, and that specimens identified as *Cheilosporum elegans* are almost certainly conspecific with those identified as *C. sagittatum*. Whether the type specimens are conspecific, however, has yet to be determined from a full comparison of relevant types.

Of the 22 non-geniculate taxa based on New Zealand region collections (Table 3), the types of 13 (*carpophylli*, *cystocarpideum*, *detrusum*, *explanatum*, *gepii*, *haptericolum*, *insigne*, *jugatum*, *monostromaticum*, *Lithothamnion novae-zeelandiae*, *Melobesia novae-zeelandiae*, *rhizomae*, *tuberculatum*) have not been examined in detail in a modern context, and thus the status and disposition of these species and infraspecific taxa remains uncertain. Of the nine types that have been studied by various authors, two (*patena*, *schielianum*) have been determined to represent distinct species of *Synarthrophyton*, one (*incisa*) to represent a distinct species of *Mesophyllum*, and one (*chathamense*) to be a taxon of uncertain status at both genus and species levels. The remaining five (*asperula*, *aucklandicum*, *cladophorae*, *caulerpae*, *leptura*) have been found to be heterotypic synonyms of one of four earlier described taxa, none of which is based on type material from the New Zealand region.

Twenty-six taxa of geniculate Corallinales recorded from the New Zealand region are based on types from localities outside that region (Table 4). The types of 11 (*berteroi*, *bowerbankii*, *corymbosa*, *filicula*, *granifera*, *lycopodioides*, *natalensis*, *pedunculata*, *pilulifera*, *tribulus*, *verrucosa*) have not been examined in detail in a modern context, and thus the status and disposition of these taxa is uncertain. This also means that uncertainty surrounds the application of these names to specimens collected from the New Zealand region. As already noted, some of these taxa are currently treated as distinct species in various publications, while others are treated as heterotypic synonyms. These treatments all require substantiation through modern studies of relevant types.

Type material of the other 15 taxa listed in Table 4 has been examined in a modern context by various authors. Nine (*affinis*, *anceps*, *brevior*, *micrarthrodia*, *officinalis*, *roseum*, *rubens*, *sagittata*, *wardii*) are considered to be distinct species or varieties; three (*cuvieri*, *gracilis*, *pilifera*) are heterotypic synonyms of *Haliptilon roseum*; and three (*australis*, *filicula*, *virgata*) require further study, although they have been listed as distinct species in publication (see comments above in individual accounts). New Zealand records for most of the nine distinct taxa are based on verifiable vouchers lodged in New Zealand herbaria. Records for heterotypic synonyms and for taxa needing further study require re-assessment.

Twenty-three taxa considered at some stage to be non-geniculate Corallinales and recorded from the New Zealand region are based on types from localities outside that region (Table 5). Two records (*decumbens*, *endophloea*) are spurious: the record of *decumbens* is based on a citation error, while that of *endophloea* ultimately pertains to *Melobesia membranacea*. The types of two other species (*decussata*, *kotschyianum*) have not been examined in detail in a modern context, and thus their status and disposition are uncertain.

Type material of the other 19 taxa listed in Table 5 has been examined in a modern context by various authors. Sixteen (*amplexifrons*, *calcareum*, *capense*, *corallinae*, *coronata*, *engelhartii*, *farinosa*, *foecundum*, *fragile*, *melobesioides*, *membranacea*, *mesomorphum*, *muelleri*, *pustulatum*, *repandum*, *thuretii*) are considered to be distinct species while three (*antarcticum*, *umbonata*, *verrucata*) are considered to be heterotypic synonyms of other taxa. The status of New Zealand region records for these 19 taxa is summarized in Table 5, with further comments provided in relevant catalogue entries.

To summarize, only four of the 29 species and infraspecific taxa based on New Zealand types (Tables 2, 3) have been confirmed in a modern context to represent distinct species. Five others have been found to be heterotypic synonyms of four other taxa, and the remaining 20 have yet to be reassessed. Of the 49 other taxa recorded from the New Zealand region but based on types from elsewhere (Tables 4, 5), 25 have been confirmed in a modern context to represent distinct species or varieties, but the occurrence of most of these in New Zealand has yet to be verified. Six others are heterotypic synonyms of other taxa, and two others represent spurious records for the New Zealand region. Types of the remaining 16 have yet to be fully reassessed in a modern context. One of the remaining two names recorded from New Zealand is a *nomen nudum* and the other is nomenclaturally illegitimate.

This catalogue and analysis represent initial steps in creating a reliable database on species biodiversity of Corallinales in the New Zealand region. To obtain an accurate picture of the actual coralline biodiversity for the New Zealand region, extensive, co-ordinated field collecting, followed by the creation of a meaningful set of reference vouchers lodged in New Zealand herbaria and, ultimately, the production of a series of monographic accounts of genera found to occur in the region will be required.

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REFERENCES

- ADAMS N.M., 1972 — The marine algae of the Wellington area. *Records of the Dominion Museum Wellington* 8: 43-98.
- ADAMS N., 1994 — *Seaweeds of New Zealand. An Illustrated Guide*. Christchurch, New Zealand, Canterbury University Press, 360 p.
- ADAMS N.M., 1997 — *Common Seaweeds of New Zealand*. Christchurch, New Zealand, Canterbury University Press, 48 p., 48 pl.
- ADAMS N.M., CONWAY E., NORRIS R.E., & WILLA E.A., 1974 — The marine algae of Stewart Island. *Records of the Dominion Museum Wellington* 8: 185-245.
- ADAMS N.M. & NELSON W.A., 1985 — The marine algae of the Three Kings Islands. *National Museum of New Zealand Miscellaneous Series* 13: 1-29.
- ADEY W.H., 1966 — The genera *Lithothamnium*, *Leptophytum* (nov. gen.) and *Phymatolithon* in the Gulf of Maine. *Hydrobiologia* 28: 321-370.
- ADEY W.H., 1970 — A revision of the Foslie crustose coralline herbarium. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1970 (1): 1-46.

- ADEY W.H. & MCKIBBIN D., 1970 — Studies on the maerl species *Phymatolithon calcareum* (Pallas) nov. comb. and *Lithothamnion corallioides* Crouan in the Ria de Vigo. *Botanica Marina* 13: 100-106.
- ADEY W.H. & LEBEDNIK P.A., 1967 — *Catalog of the Foslie Herbarium*. Trondheim, Norway, Det Kongelige Norske Videnskabers Selskab Museet, 92 p.
- ADEY W.H., TOWNSEND R.A., & BOYKINS W.T., 1982 — The crustose coralline algae (Rhodophyta: Corallinaceae) of the Hawaiian Islands. *Smithsonian Contributions to the Marine Sciences* 15: i-iv,1-74.
- AGARDH J.G., 1871 — On Chatham-Oarnes Alger. *Öfversigt af Kongelige Vetenskaps-Akademiens Förhandlingar* 5: 435-456.
- ALONGI G., CORMACI M. & FURNARI G., 2002 — The Corallinaceae (Rhodophyta) from the Ross Sea (Antarctica): a taxonomic revision rejects all records except *Phymatolithon foecundum*. *Phycologia* 41: 140-146.
- AMBLER M.P. & CHAPMAN V.J., 1950 — A quantitative study of some factors affecting tide pools. *Transactions of the Royal Society of New Zealand* 78: 394-409.
- ANDERSSON R. & ATHANASIADIS A., 1992 — *A Catalog of Taxa in the Phycological Herbarium of Göteborg*. Göteborg, Sweden, Department of Marine Botany, Botanical Institute, University of Göteborg, ii + 122 p.
- ANONYMOUS., 1824 — *Corallina or a Classical Arrangement of Flexible Coralline Poly-podiums, selected from the French of J.V. F. Lamouroux*. London, Sherwood and Co., 284 p., 19 pl. Note: Constitutes an abridged translation of Lamouroux 1816.
- ARESCHOUG J.E., 1852 — Ordo XII. Corallinaceae. In: Agardh J.G. (ed.), *Species, Genera, et Ordines Algarum*. Vol. 2, Part 2. Lund, C.W.K. Gleerup, pp. 506-576.
- ASKENASY E., 1888 — Algen mit Unterstützung der Herren E. Bornet, A. Grunow, P. Hariot, M. Moebius, O. Nordstedt. Berlin, Ernst Siegfried Mittler und Sohn, 58 p., 12 pl. Note: subsequently published as part of Die Forschungsreise S.M.S. "Gazelle" in den Jahren 1874 bis 1876. IV. Theil. Botanik (Askenasy 1889).
- ASKENASY E., 1889 — Algen mit Unterstützung der Herren E. Bornet, A. Grunow, P. Hariot, M. Moebius, O. Nordstedt. In: Engler A. (ed.), *Die Forschungsreise S.M.S. "Gazelle" in den Jahren 1874 bis 1876. IV. Theil. Botanik*. Ernst Siegfried Mittler und Sohn: Berlin. Chapter 2, pp. 1-58, pl. 1-12. Note: first published independently (Askenasy 1888) and treated here as a book.
- ASKENASY M.E., 1896 — Énumération des algues des Iles du Cap Vert. *Boletim da Sociedade Broteriana* 13: 150-175. Note: also issued as an independently paginated offprint (pp. 1-26).
- ATHANASIADIS A., 1999 — *Mesophyllum macedonis* sp. nov. (Rhodophyta, Corallinales), a putative Tethyan relic in the North Aegean Sea. *European Journal of Phycology* 34: 239-252.
- BABA M., JOHANSEN H.W. & MASAKI T., 1988 — The segregation of three species of *Corallina* (Corallinales, Rhodophyta) based on morphology and seasonality in northern Japan. *Botanica Marina* 31: 15-22.
- BABBINI L. & BRESSAN G., 1997 — *Recensement de Corallinacées de la Mer Méditerranée et considérations phytogéographiques*. Berlin, J. Cramer, 421 p. Note: Vol. 103 in the series *Bibliotheca Phycologica*.
- BALLESTEROS E. & AFONSO-CARRILLO J., 1995 — Species records and distribution of shallow-water coralline algae in a western Indian ocean coral reef (Trou Deau Douce, Mauritius). *Botanica Marina* 38: 203-213.
- BARRY G.C. & WOELKERLING W.M. J., 1995 — Non-geniculate species of Corallinaceae (Corallinales, Rhodophyta) in Shark Bay, Western Australia: biodiversity, salinity tolerances and biogeographic affinities. *Botanica Marina* 38: 135-149.
- BARTON E.S., 1893 — A provisional list of the marine algae of the Cape of Good Hope. *Journal of Botany British and Foreign* 31: 53-56, 81-84, 110-114, 138-144, 171-177, 202-210. Note: also issued as a single, independently paginated offprint (pp. 1-32).
- BATHAM E.J., 1956 — Ecology of southern New Zealand sheltered rocky shore. *Transactions of the Royal Society of New Zealand* 84: 447-465, pl. 429-431.

- BATTERS E.A.L., 1892 — On *Schmitziella*; a new genus of endophytic algae, belonging to the order Corallinales. *Annals of Botany* 6: 185-194, pl., 10.
- BERGQUIST P.L., 1960 — Notes on the marine algal ecology of some exposed rocky shores of Northland, New Zealand. *Botanica Marina* 1: 86-94.
- BØRGESEN F., 1902 — The marine algae of the Faeroes. In: Warming E. (ed.), *Botany of the Faeroes*, part II, det nordiske Forlag, Copenhagen. Copenhagen, H.H. Tiele, pp. 339-532.
- BROADWATER S.T., HARVEY, A.S., LAPOINTE, E.A. & WOELKERLING W.J., 2002 — Conceptacle structure of the parasitic coralline red alga *Choreonema thuretii* (Corallinales) and its taxonomic implications. *Journal of Phycology* 38: 1157-1168.
- BURROWS C.J., 1972 — The flora and vegetation of Open Bay Islands. *Journal of the Royal Society of New Zealand* 2: 15-42.
- CABIOCH J., 1972 — Étude sur les Corallinacées. II. La morphogenèse; conséquences systématiques et phylogénétiques. *Cahiers de Biologie Marine* 13: 137-288, pl. 1-12.
- CARNAHAN J.A., 1952 — Inter-tidal zonation at Rangitoto Island, New Zealand. (Studies in inter-tidal zonation 4.). *Pacific Science* 6: 35-46.
- CASSIE V., 1971 — Contributions of Victor Lindauer (1888-1964) to New Zealand phycology. *Journal of the Royal Society of New Zealand* 1: 89-98.
- CHAMBERLAIN Y.M., 1983 — Studies in the Corallinales with special reference to *Fosliella* and *Pneophyllum* in the British Isles. *Bulletin of the British Museum (Natural History)*, *Botany* 11: 291-463.
- CHAMBERLAIN Y.M., 1985 — The typification of *Melobesia membranacea* (Esper) Lamouroux (Rhodophyta, Corallinales). *Taxon* 34: 673-677.
- CHAMBERLAIN Y.M., 1986 — A reassessment of the type specimens of *Titanoderma verrucatum* and *T. macrocarpum* (Rhodophyta, Corallinales). *Cryptogamie Algologie* 7: 193-213.
- CHAMBERLAIN Y.M., 1990 — The genus *Leptophytum* (Rhodophyta, Corallinales) in the British Isles with descriptions of *Leptophytum bornetii*, *L. elatum* sp. nov. and *L. laeve*. *British Phycological Journal* 25: 179-199.
- CHAMBERLAIN Y.M., 1991 — Historical and taxonomic studies in the genus *Titanoderma* (Rhodophyta, Corallinales) in the British Isles. *Bulletin of the British Museum (Natural History)*, *Botany* 21: 1-80.
- CHAMBERLAIN Y.M., 1994a — Mastophoroideae. In: Irvine L.M. & Chamberlain Y.M. (ed.), *Seaweeds of the British Isles. Volume 1 Rhodophyta Part 2B Corallinales, Hildenbrandiales*. London, HMSO Books, The Natural History Museum, pp. 113-158.
- CHAMBERLAIN Y.M., 1994b — *Pneophyllum coronatum* (Rosanoff) D. Penrose comb. nov., *P. keatsii* sp. nov., *Spongites discoideus* D. Penrose et Woelkerling and *S. impar* (Foslie) Chamberlain comb. nov. (Rhodophyta, Corallinales) from South Africa. *Phycologia* 33: 141-157.
- CHAMBERLAIN Y.M., 1997 — Seaweeds, Order Corallinales. Coralline Algae (encrusting forms). In: Richmond M.D. (ed.), *A Guide to the Seashores of Eastern Africa and the West Indian Ocean Islands*. Stockholm, Swedish International Development Cooperation Agency (Sida), pp. 96-97.
- CHAMBERLAIN Y.M. 2000 — *Mesophyllum capense* (Rosanoff) comb. nov. (Rhodophyta, Corallinales) from South Africa. *Cryptogamie Algologie* 21: 365-379.
- CHAMBERLAIN Y.M. & IRVINE L.M., 1994a — Lithophylloideae Setchell. In: Irvine L.M. & Chamberlain Y.M. (ed.), *Seaweeds of the British Isles. Volume 1 Rhodophyta Part 2B Corallinales, Hildenbrandiales*. London, HMSO Books, The Natural History Museum, pp. 58-112.
- CHAMBERLAIN Y.M. & IRVINE L.M., 1994b — Melobesioideae Bizzozero. In: Irvine L.M. & Chamberlain Y.M. (ed.), *Seaweeds of the British Isles. Volume 1 Rhodophyta Part 2B Corallinales, Hildenbrandiales*. London, HMSO Books, The Natural History Museum, pp. 159-234.
- CHAMBERLAIN Y.M. & IRVINE L.M., 1994c — Choreonematoideae Woelkerling. In: Irvine L.M. & Chamberlain Y.M. (ed.), *Seaweeds of the British Isles. Volume 1*

- Rhodophyta Part 2B Corallinales, Hildenbrandiales*. London, HMSO Books, The Natural History Museum, pp. 33-36.
- CHAMBERLAIN Y.M. & KEATS D.W., 1995 — The melobesoid alga *Mesophyllum engelhartii* (Rhodophyta, Corallinaceae) in South Africa. *South African Journal of Botany* 61: 134-146.
- CHAMBERLAIN Y.M. & NORRIS R., 1994 — *Pneophyllum amplexifrons* (Harvey) comb. nov., a mastophoroid crustose coralline red algal epiphyte from Natal, South Africa. *Phycologia* 33: 8-18.
- CHAPMAN V.J., 1946 — Recent advances in phycology, with special reference to the southern hemisphere. *The Australian Journal of Science* 9: 108-114.
- CHAPMAN V.J., 1950 — The marine algal communities of Stanmore Bay, New Zealand (Studies in Inter-tidal zonation 1.). *Pacific Science* 4: 63-68.
- CHAPMAN V.J., 1951 — Notes on New Zealand algae. *Transactions and Proceedings of the Royal Society of New Zealand* 79: 84-86.
- CHAPMAN V.J., 1954 — Algae of the Three Kings Islands, New Zealand. *Record of the Auckland Institute and Museum* 4: 199-204.
- CHAPMAN V.J., 1961 — A contribution to the ecology of the Kermadec Islands. *Pacific Science* 15: 347-351.
- CHAPMAN V.J., 1977 — Marine algae of Norfolk Island and the Cook Islands. *Botanica Marina* 20: 161-165.
- CHAPMAN V.J. & PARKINSON P.G., 1974 — *The Marine Algae of New Zealand. Part III: Rhodophyceae. Issue 3: Cryptonemiales*. Lehre, Germany, J. Cramer, pp. 155-278, pl. 51-94.
- COTTON A.D., 1907 — Marine algae from the Chatham Islands. *Bulletin of Miscellaneous Information. Royal Botanic Gardens, Kew* 1907: 37-43.
- COTTON A.D., 1912 — Marine algae from the north of New Zealand and the Kermadecs. *Bulletin of Miscellaneous Information. Royal Botanic Gardens, Kew* 1912: 256-264.
- COTTON A.D., 1915a — Cryptogams from the Falkland Islands collected by Mrs Vallentin. *Journal of the Linnean Society, Botany* 43: 137-231, pl. 4-10.
- COTTON A.D., 1915b — Some Chinese marine algae. *Bulletin of Miscellaneous Information. Royal Botanic Gardens, Kew* 3: 197-113.
- CRANWELL L.M. & MOORE L.B., 1935 — Botanical notes on the Hen and Chicken Islands. *Record of the Auckland Institute and Museum* 1: 301-318
- CRIBB A.B., 1983 — *Marine Algae of the Southern Great Barrier Reef - Rhodophyta*. Brisbane, Australian Coral Reef Society, 173 p., 171 pl., index.
- CROUAN P.-L. & CROUAN H.M., 1867 — *Florule du Finistère*. Paris, F. Klincksieck, x + 262 p., 232 pl.
- DAWSON E.Y., 1953 — Marine red algae of Pacific Mexico. Part I. Bangiales to Corallinaceae subf. Corallinoideae. *Allan Hancock Pacific Expeditions* 17 (1): 1-171, pl. 1-33. Effective publication date: 27.ii.1953. Cover is dated 1952 but issue date (27.ii.1953) explicitly stated on reverse of inside title page.
- DAWSON E.Y., 1955 — A preliminary working key to the living species of *Dermatolithon*. In: Anonymous (ed.), *Essays in the Natural Sciences in Honor of Captain Allan Hancock*. Los Angeles, University of Southern California Press, pp. 271-277.
- DAWSON E.Y., 1960 — Marine red algae of Pacific Mexico. Part 3. Cryptonemiales, Corallinaceae, subf. Melobesioideae. *Pacific Naturalist* 2 (1): 3-125. Effective publication date: 24.x.1960 (stated on cover of journal issue).
- DECAISNE J., 1842a — Essais sur une classification des algues et des polypiers calcifères de Lamouroux. *Annales des Sciences Naturelles. Botanique*, sér 2, 17: 297-380, pl. 14-17.
- DECAISNE J., 1842b — Mémoire sur les Corallines ou Polypiers calcifères. *Annales des Sciences Naturelles. Botanique*, sér 2, 18: 96-128.
- DELLOW V., 1950 — Inter-tidal ecology at narrow Neck reef, New Zealand (Studies in inter-tidal zonation 3.). *Pacific Science* 4: 355-374.
- DELLOW V., 1955 — Marine algal ecology of the Hauraki Gulf, New Zealand. *Transactions of the Royal Society of New Zealand* 83: 1-91.

- DELLOW V. & CASSIE R.M., 1955 — Littoral zonation in two caves in the Auckland district. *Transactions of the Royal Society of New Zealand* 83: 321-331.
- DE TONI G.B., 1905 — *Sylloge Algarum Omnium Hucusque Cognitarum*. Vol. 4. Sylloge Floridearum., Sect. 4. Padova, privately published, pp. 1523-1973.
- DE TONI G.B., 1924 — *Sylloge Algarum Omnium Hucusque Cognitarum*. Vol. 6. Sylloge Floridearum, Sect. 5. Additamenta. Padova, privately published, xi + 767 p. Note: Section 5 refers to the continuation of Volume 4, Section 4.
- DE TONI G.B. & FORTI A., 1922 — Alghe di Australia, Tasmania e Nuova Zelanda. *Memorie del Reale Istituto Veneto di Scienze, Lettere ed Arti* 29(3): 1-183, pl. 4-13. Effective publication date: October 1922 (Staflou & Mennega 1998: 248)
- DE TONI G.B. & LEVI D., 1888 — *L'Algarium Zanardini*. Venice, M. Fontana, 144 p.
- DENIZOT M., 1968 — *Les Algues Floridees Encroutantes (a l'exclusion des Corallinales)*. Paris, privately published, 310 p. Note: also presented as a thesis for the degree of Docteur es sciences Naturelles to the Faculty of science of the University of Paris.
- DICKIE G., 1876 — Marine algae collected by Mr. Moseley at the Island of Kerguelen. *The Journal of the Linnean Society (Botany)* 15: 43-47.
- DICKIE G., 1879 — Marine algae (exclusive of the Diatomaceae). *Philosophical Transactions of the Royal Society of London* 168 (extra vol.): 53-64, pl. 55, fig. 53.
- DIXON P.S., 1960 — Notes on important algal herbaria. II. The herbarium of John Ellis (?1710-1776). *The British Phycological Bulletin* 2: 28-31.
- DÜWEL L. & WEGEBERG S., 1996 — The typification and status of *Leptophytum* (Corallinales, Rhodophyta). *Phycologia* 35: 470-483.
- ELLIS J., 1768 — Extract of a letter from John Ellis Esquire, F.R.S. to Dr. Linnaeus of Upsal, F.R.S. on the animal nature of the genus of zoophytes, called *Corallina*. *Philosophical Transactions of the Royal Society of London* 57(1): 404-427, pl. 17-18.
- ELLIS J. & SOLANDER D., 1786 — *The Natural History of many Curious and Uncommon Zoophytes*. London, B. White and Son, xii + 208 p., 62 pl.
- ESPER E.G. C., 1796 — *Fortsetzungen der Pflanzenthiere in Abbildungen nach der Natur mit Farben erleuchtet nebst Beschreibungen*. Nurnberg, Raspe, Lieferung 6, pp. 149-168, 11 pl. (*Gorgonia* Tab. 48; *Antipathes* Tab. 12; *Spongia* Tab. 53-54; *Flustra* Tab. 9; *Corallina* Tab. 12; *Sertularia* Tab. 30-32; *Vorticella* Tab. 1-2). Note: Lieferungen 1-8 were issued collectively in 1797 with the title page *Fortsetzungen der Pflanzenthiere in Abbildungen nach der Natur mit Farben erleuchtet nebst Beschreibungen, Erster Theil, mit hundertundsechs illuminierten Kupfertafeln*. See Ott 1995 (*Annalen des Naturhistorischen Museums in Wien* 97 (B): 1-36) for publication details for the entire work.
- ETCHEVERRY D.H., 1986 — *Algas Marinas Benticas de Chile*. Montevideo, Uruguay, UNESCO (Regional office of Science and Technology for Latin America and the Caribbean). [i] + 379 p.
- FOSLIE M., 1897a — Einige Bemerkungen über Melobesieae. *Berichte der Deutschen Botanischen Gesellschaft* 15: 252-260.
- FOSLIE M., 1897b — On some lithothamnia. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1897 (1): 1-20.
- FOSLIE M., 1898 — List of species of the lithothamnia. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1898 (3): 1-11.
- FOSLIE M., 1900 — New or critical calcareous algae. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1899 (5): 1-34.
- FOSLIE M., 1901 — New melobesieae. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1900 (6): 1-24.
- FOSLIE M., 1903a — Two new lithothamnia. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1903 (2): 1-4.
- FOSLIE M., 1903b — Den botaniske samling. *Det Kongelige Norske Videnskabers Selskabs Aarsberetning* 1902: 23-25. Note: also issued as an unpaginated offprint dated 12.ii.1903.
- FOSLIE M., 1904a — Algologiske notiser. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1904 (2): 1-9.

- FOSLIE M., 1904b — I. Lithothamnionaceae, Melobesieae, Mastophoreae. *Siboga Expeditie* 61: 10-77, pl. i-xiii. Note: part of Weber van Bosse, A. & Foslie, M. 1904 — The Corallinaceae of the Siboga expedition. *Siboga Expeditie* 61: 1-110, pl. 1-16.
- FOSLIE M., 1904c — Die Lithothamnien des Adriatischen Meeres und Marokkos. *Wissenschaftliche Meeresuntersuchungen* 7 (1): 1-40, pl. 1- 3.
- FOSLIE M., 1905 — Den botaniske samling. *Det Kongelige Norske Videnskabers Selskabs Aarsberetning* 1904: 15-18.
- FOSLIE M., 1906a — Algologiske notiser II. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1906 (2): 1-28.
- FOSLIE M., 1906b — Den botaniske samling. *Det Kongelige Norske Videnskabers Selskabs Aarsberetning* 1905: 17-24. Note: also issued as an independently paginated offprint (pp. 1-8).
- FOSLIE M., 1907a — Algologiske notiser. III. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1906 (8): 1-34.
- FOSLIE M., 1907b — Algologiske notiser. IV. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1907 (6): 1-30.
- FOSLIE M., 1907c — Antarctic and subantarctic Corallinaceae. *Wissenschaftliche Ergebnisse der Schwedischen Südpolar-Expedition 1901-1903* 4 (5): 1-16, 12 pl.
- FOSLIE M., 1908a — Bemerkungen über kalkalgen. *Beihefte zum Botanischen Centralblatt* 23 (2): 266-272.
- FOSLIE M., 1908b — *Pliostroma*, a new subgenus of *Melobesia*. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1908 (11): 1-7.
- FOSLIE M., 1908c — Bemerkungen über kalkalgen. *Beihefte zum Botanischen Centralblatt* 23 (2): 266-272.
- FOSLIE M., 1909 — Algologiske notiser. VI. *Det Kongelige Norske Videnskabers Selskabs Skrifter* 1909 (2): 1-63.
- GAIN L., 1912 — *La flore algologique des régions Antarctiques et Subantarctiques*. Paris, Masson et Cie, 218 p., 98 fig., 8 pl., 1 map. Note: part of Deuxième Expédition Antarctique Française (1908-1910) Commandée par le Dr Jean Charcot. Sciences Naturelles: Documents Scientifiques.
- GANESAN E.K., 1968 — Studies on the morphology and reproduction of the articulated corallines - III. *Amphiroa* Lamouroux emend. Weber van Bosse. *Phykos* 6: 7-28, pl. I. Effective publication date: journal cover dated 1967 but issue date of September 1968 explicitly indicated on back of journal title page.
- GARBARY D.J. & JOHANSEN H.W., 1982 — Scanning electron microscopy of *Corallina* and *Haliptilon* (Corallinaceae, Rhodophyta): surface features and their taxonomic implications. *Journal of Phycology* 18: 211-219.
- GEPP A. & GEPP E.S., 1905 — Some cryptogams from Christmas Island. *The Journal of Botany, British and Foreign* 43: 337-344. Note: also issued as an independently paginated offprint (pp. 1-8).
- GEPP A. & GEPP E.S., 1911 — Marine algae from the Kermadecs. *The Journal of Botany, British and Foreign* 49: 17-23.
- GONZÁLEZ-GONZÁLEZ J., GOLD-MORGAN M., LEÓN-TEJERA H., CANDELARIA C., LEÓN-ALVAREZ D., E.S. & FRAGOSA D., 1996 — *Catálogo Onomástico (nomenclátor) y Bibliografía Indexada de Las Algas Bentónicas Marinas de México*. México, D.F., Universidad Nacional Autónoma de México, 492 p. Note: Vol. 29 in the series *Cuadernos del Instituto de Biología*.
- GORDON G.D., MASAKI T. & AKIOKA H., 1976 — Floristic and distributional account of the common crustose coralline algae of Guam. *Micronesica* 12: 247-277.
- GREUTER W.C., MCNEILL J.V.-C., BARTRIE F.R., BURDET H.M., DEMOULIN V., FILGUEIRAS T.S., NICHOLSON D.H., SILVA P.C., SKOG J.E., TREHANE P., TURLAND N.J. & HAWKSWORTH D.L.S., 2000 — *International Code of Botanical Nomenclature (St Louis Code) Adopted by the Sixteenth International Botanical Congress, St Louis, Missouri, July - August 1999*. Königstein, Germany, Koeltz Scientific Books, xviii + 474 p. Note: Vol. 138 in the series *Regnum Vegetabile*.

- GRUNOW A., 1873 — Algen der Fische - Tonga - und Samoa - Inseln, gesammelt von Dr. E. Graeffe. *Journal des Museum Godeffroy* 3(6): 23-50. Note: also issued as an independently paginated offprint (pp. 1-28).
- HARDY G. & GUIRY M.D., 2003 — *A Check-list and Atlas of the Seaweeds of Britain and Ireland*. London, British Phycological Society, x + 435 p.
- HARIOT P., 1891 — Contribution à la flore cryptogamique de la Terre de Feu. *Bulletin de la Société Botanique de France* 38: 416-422.
- HARIOT P., 1892 — Complément à la flore algologique de la Terre de Feu. *Notarisia* 7: 1427-1435.
- HARIOT P., 1902 — Quelques algues de Madagascar. *Bulletin du Muséum D'Histoire Naturelle* 8: 470-472.
- HARVEY A., BROADWATER S., WOELKERLING W.J., & MITROVSKI P., 2003 — *Choreonema* (Corallinales, Rhodophyta): 18S rDNA phylogeny and resurrection of the Hapalidiaceae for the subfamilies Choreonematoideae, Austrolithoideae and Melobesioideae. *Journal of Phycology* 39: 988-998.
- HARVEY A.S., WOELKERLING W.M. J., & WILKS K.M., 1994 — The genus *Synarthrophyton* (Corallinaceae, Rhodophyta) in southern Australia. *Phycologia* 33: 331-342.
- HARVEY W.H., 1849 — *Nereis Australis*, Part II. London, Reeve, pp. 65-124, pl. 26-50. Note: for data on publication date, see *Taxon* 17: 82, 725 (1968) and *The Journal of Botany, British and Foreign* 7: 49-52 (1848).
- HARVEY W.H., 1850 — *Phycologia Britannica*. London, Reeve and Benham, Fasc. 49, plates 289-294. Note: According to Price (1984: 436) Fascicle 49 was issued on 1.viii.1850, and according to Stafleu & Cowan (1979: 72-73), it appeared in Vol. 3 of the original 3 volume publication. A detailed account of aspects relating to the publication of *Phycologia Britannica* is given in Price (1988).
- HARVEY W.H., 1855a — Nat. Ord. CIII. Algae, L. In: Hooker J.D. (Ed.), *The Botany of the Antarctic Voyage*. II. Flora Novae-Zelandiae. Part II. Flowerless Plants. London, Lovell Reeve, pp. 211-266.
- HARVEY W.H., 1855b — Some account of the marine botany of the colony of Western Australia. *The Transactions of the Royal Irish Academy* 22(1): 525-566.
- HARVEY W.H., 1859 — Algae. In: Hooker J.D. (ed.), *The Botany of the Antarctic Voyage*. Part III. Flora Tasmaniae, Vol. 2. London, Reeve, pp. 242-383, pl. 185-196. Note: the title page of volume is dated 1860, but according to Stafleu & Cowan (1979: 271), the work was completed in 1859.
- HARVEY W.H., 1863 — *Phycologia Australica*. Vol. 5. L. London, Reeve, [i]-x + v-lxxiii (synoptic catalogue), pl. 241-300.
- HARVEY W.H., 1867 — Algae. In: Hooker J.D. (ed.), *Handbook of the New Zealand Flora: a Systematic Description of the Native Plants of New Zealand and the Chatham, Kermadec's, Lord Auckland's, Campbell's and Macquarrie's Islands*. London, Reeve, pp. 638-721.
- HARVEY W.H. & HOOKER J.D., 1845a — Algae. In: Hooker J.D. (ed.), *The Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror in the Years 1839-1843*. Vol. 1. *Flora Antarctica*, Part 1. *Botany of Lord Auckland's Group and Campbell's Island*. London, Reeve, pp. 175-193, pl. 69-78.
- HARVEY W.H. & HOOKER J.D., 1845b — Algae. In: Hooker J.D. (ed.), *The Cryptogamic Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror in the Years 1839-1843*. [Part 1]. London, Reeve, pp. 63-81, pl. 69-78.
- HARVEY W.H. & HOOKER J.D., 1847a — Algae. In: Hooker J.D. (ed.), *The Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror in the Years 1839-1843*. Vol. 1. *Flora Antarctica*, Part 2. *Botany of Fuegia, The Falklands, Kerguelan's Land etc.* London., Reeve, pp. 454-502, pl. 152-198. Note: Authorship not indicated on p. 454, but explicitly given on p. 175 of Part 1 of *Flora Antarctica* (Botany of Lord Auckland's Group and Campbell's Island), published in 1845.
- HARVEY W.H. & HOOKER J.D., 1847b — Algae. In: Hooker J.D. (ed.), *The Cryptogamic Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror in the Years 1839-1843*. [Part 2]. London, Reeve, pp. 148-196, pl. 167-194. Note:

- Authorship not indicated on p. 148, but is explicitly given on p. 63 the first part, published in 1845.
- HARVEY-GIBSON R.J., 1893 — On some marine algae from New Zealand. *The Journal of Botany, British and Foreign* 31: 161-167, pl. 335.
- HAY C.H., ADAMS N.M., & PARSONS M.J., 1985 — Marine algae of the subantarctic islands of New Zealand. *National Museum of New Zealand Miscellaneous Series* 11: 1-70.
- HEMSLEY W.B., 1885 — Report on the botany of the Bermudas and various other islands of the Atlantic and southern oceans. *Report on the Scientific Results of the Voyage of H.M.S. Challenger, Botany* 1(3): 1-299, pl. 214-253.
- HEYDRICH F., 1893 — Vier neue Florideen von Neu-Seeland. *Berichte der Deutschen Botanischen Gesellschaft* 11: (75)-(79), pl. 22.
- HEYDRICH F., 1897a — Corallinaceae, insbesondere Melobesieae. *Berichte der Deutschen Botanischen Gesellschaft* 15: 34-71, pl. 3.
- HEYDRICH F., 1897b — Melobesieae. *Berichte der Deutschen Botanischen Gesellschaft* 15: 403-420, pl. 18.
- HEYDRICH F., 1901 — Die Lithothamnien des Muséum d'Histoire Naturelle in Paris. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 28: 529-545, pl. 11.
- HIEPKO P., 1987 — The collections of the Botanical Museum Berlin-Dahlem (B) and their history. *Englera* 7: 219-252.
- HOLMGREN P., HOLMGREN N.H. & BARTLETT L.C., 1990 — *Index Herbariorum, Pt. 1. The Herbaria of the World*. Ed. 8. Königstein, Germany, Koeltz Scientific Books, x + 693 p.
- HOOKER J.D. & HARVEY W.H., 1845 — Algae Novae Zealandiae. *London Journal of Botany* 4: 521-551. Note: also issued as an independently paginated offprint (pp. 1-31).
- HOWE M.A., 1920 — Class 2. Algae. In: Britton N.L. & Millspaugh C.F. (ed.), *The Bahama Flora*. New York, privately published, pp 553-631.
- HUISMAN J., 1997 — Marine benthic algae of the Houtman Abrolhos Islands, Western Australia. In: Wells F.E. (ed.), *The Marine Flora and Fauna of the Houtman Abrolhos Islands, Western Australia*. Perth, Western Australian Museum, pp. 177-237.
- HUISMAN J.M., 2000 — *Marine Plants of Australia*. Perth, University of Western Australia Press, ix + 300 p.
- HUISMAN J.M. & WALKER D.I., 1990 — A catalogue of the marine plants of Rottneest Island, Western Australia, with notes on their distribution and biogeography. *Kingia* 1: 349-459.
- IRVINE L.M. & JOHANSEN H.W., 1994 — Corallinoideae. In: Irvine L.M. & Chamberlain Y.M. (ed.), *Seaweeds of the British Isles. Volume 1 Rhodophyta Part 2B Corallinales, Hildenbrandiales*. London, HMSO Books, The Natural History Museum, pp. 37-57.
- JOHANSEN H.W., 1969 — Morphology and systematics of coralline algae with special reference to *Calliarthron*. *University of California Publications in Botany* 49: 1-78, pl. 1-19.
- JOHANSEN H.W., 1971 — Changes and additions to the articulated coralline flora of California. *Phycologia* 10: 241-249.
- JOHANSEN H.W., 1976 — Family Corallinaceae. In: Abbott I.A. & Hollenberg G.J. (ed.), *Marine Algae of California*. Stanford, California, Stanford University Press, pp. 379-419.
- JOHANSEN H.W., 1977 — The articulated Corallinaceae (Rhodophyta) of South Africa. I. *Cheilosporum* (Decaisne) Zanardini. *South African Journal of Botany* 43: 163-185.
- JOHANSEN H.W., 1999 — Order Corallinales. In: Abbott I.A. (ed.), *Marine Red Algae of the Hawaiian Islands*. Honolulu, Hawaii, Bishop Museum Press, pp. 176-190.
- JOHANSEN H.W. & SILVA P.C., 1978 — Janieae and Lithotricheae: two new tribes of articulated Corallinaceae (Rhodophyta). *Phycologia* 17: 413-417.

- JOHANSEN H.W. & WOMERSLEY H.B.S., 1986 — *Haliptilon roseum* (Corallinaceae, Rhodophyta) in Southern Australia. *Australian Journal of Botany* 34: 551-567.
- JOHANSEN H.W. & WOMERSLEY H.B.S., 1994 — *Jania* (Corallinales, Rhodophyta) in southern Australia. *Australian Systematic Botany* 7: 605-625.
- JOHNSON K.A., 1975 — Observations on the marine algae of the Auckland Islands. In: Yaldyn J.C. (ed.), *Preliminary Report of the Auckland Islands Expedition 1972-1973*. Wellington, New Zealand, Department of Lands and Survey, pp. 50-54.
- JONES P.L. & WOELKERLING W.J., 1984 — An analysis of trichocyte and spore germination attributes as taxonomic characters in the *Pneophyllum* - *Fosliella* complex (Corallinaceae, Rhodophyta). *Phycologia* 23: 183-194.
- KEATS D.W. & CHAMBERLAIN Y.M., 1997 — The non-geniculate coralline algae *Synarthrophyton eckloniae* (Foslie) comb. nov., and *S. magellanicum* (Foslie) comb. nov. in South Africa including a comparison with the types of *Lithophyllum schmitzii* Hariot, *Lithothamnion magellanicum*, *L. muelleri* f. *neglecta* Foslie, *L. lamellatum* Setchell & Foslie, and *L. chatamense* Foslie. *European Journal of Phycology* 32: 55-79.
- KEATS D.W. & MANVELDT G., 1997a — First report of the melobesioid alga (Corallinales, Rhodophyta) *Mesophyllum incisum* (Foslie) Adey in South Africa. *South African Journal of Botany* 63: 201-209.
- KEATS D.W. & MANVELDT G., 1997b — Two new melobesioid algae (Corallinales, Rhodophyta), *Synarthrophyton robbenense* sp. nov. and *S. munimentum* sp. nov., in South Africa and Namibia. *Phycologia* 36: 447-467.
- KJELLMAN F.R., 1883 — Norra Ishafvets Algflora. *Vega-expeditionens Vetenskapliga Iakttagelser* 3: 1-431, pl. 1-31, 4 tables. Note: Subsequently published in English (Kjellman 1885).
- KJELLMAN F.R., 1885 — The algae of the Arctic Sea. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* 20(5): 1-351, pl. 1-31, 4 tables. Note: Dated 1883 but not effectively published until 1885; this is the English version of Kjellman 1883.
- KLOCHKOVA N. G., 1998 — An annotated bibliography of marine macroalgae on north-west coast of the Bering Sea and southeast Kamchatka: the first revision of flora. *Algae* 13: 375-418.
- KNOX G.A., 1953 — The intertidal ecology of Taylor's Mistake, Banks Peninsula. *Transactions of the Royal Society of New Zealand* 81: 189-220, pl. 115-116.
- KÜTZING F.T., 1843 — *Phycologia Generalis*. Lipsiae, F.A. Brockhaus, xxii + 458 p., 80 pl.
- KÜTZING F.T., 1849 — *Species Algarum*. Lipsiae, F.A. Brockhaus, vi + 922 p.
- KÜTZING F.T., 1858 — *Tabulae Phycologicae*. Vol. 8. Nordhausen, privately published, ii + 48 p., 100 pl.
- KÜTZING F.T., 1869 — *Tabulae Phycologicae*. Vol. 19. Nordhausen, privately published, iv + 36 p., 100 pl.
- LAINING R.M., 1895 — The algae of New Zealand: their characteristics and distribution. *Transactions and Proceedings of the New Zealand Institute* 27: 297-318.
- LAINING R.M., 1896 — Catalogue of the marine algae found in the Dunedin District. In: Anonymous (ed.), *Dunedin Field Club, Catalogues of the Indigenous and Introduced Flowering Plants, Ferns and Seaweeds Occurring in the Dunedin District*. Dunedin, New Zealand, Fergusson and Mitchell:, pp. 30-33.
- LAINING R.M., 1902 — Revised list of New Zealand seaweeds. Part II. *Transactions and Proceedings of the New Zealand Institute* 34: 327-359.
- LAINING R.M., 1905 — Revised list of New Zealand seaweeds. Appendix I. *Transactions and Proceedings of the New Zealand Institute* 37: 380-384.
- LAINING R.M., 1909 — The marine algae of the subantarctic islands of New Zealand. In: Chilton C. (ed.), *The Subantarctic Islands of New Zealand*. Vol. 2. Wellington, New Zealand, Government Printer, pp. 493-527, pl. 21-24.
- LAINING R.M., 1916 — Catalogue of the marine algae found in the Dunedin District. In: Anonymous (ed.), *Dunedin Field Club, Catalogues of the Indigenous and Introduced Flowering Plants, Ferns and Seaweeds Occurring in the Dunedin District*. Dunedin, New Zealand, Orr, Campbell & Co., pp. 31-38.

- LAING R.M., 1926 — A reference list of New Zealand marine algae. *Transactions and Proceedings of the New Zealand Institute* 57: 126-185. Note: journal volume is dated 1927, but part containing this article appeared in November 1926.
- LAING R.M., 1932 — List of seaweeds from the coast near Dunedin. In: Anonymous (ed.), *Dunedin Naturalists' Field Club, Catalogue of the Indigenous and Introduced Flowering Plants, Ferns and Seaweeds Occurring in the Dunedin District*. Dunedin, New Zealand Mills, Dick and Co., pp. 31-41.
- LAMARCK J.B., 1815 — Suite et fin des polypiers corticifères. *Mémoires du Muséum National d'Histoire Naturelle, Série. A 2*: 227-240.
- LAMOUREUX J.V.F., 1812 — Extrait d'un mémoire sur la classification des polypiers coralligènes non entièrement pierreux. *Nouveau Bulletin des Sciences, par la Société Philomatique de Paris* 3: 181-188.
- LAMOUREUX J.V.F., 1816 — *Histoire des Polypiers Coralligènes Flexibles, Vulgairement Nommés Zoophytes*. Caen, F. Poisson, lxxxiv + 559 p., 19 pl., 1 chart. Note: An abridged English version was published by an unknown translator in 1824 (see Anonymous 1824).
- LAMOUREUX J.V.F., 1821 — *Exposition Méthodique des Genres de l'Ordre des Polypiers*. Paris, Veuve Agasse, viii +115 p., 84 pl., 1 chart.
- LAMOUREUX J.V.F., 1823 — Coralline. *Dictionnaire Classique d'Histoire Naturelle* 4: 455-457. Note: published by Ray et Gravier, Paris.
- LAMOUREUX J.V.F., 1825-1826 — Section III. Description des Polypiers flexibles. In: Quoy [J.R.C.] & Gaimard [P.] (Ed.), *Voyage Autour du Monde Exécuté sur les corvettes de S.M. l'Uranie et la Physicienne pendant les années 1817, 1818, 1819 et 1820. Zoologie*. Paris, Pillet Anié, pp. 603-643, Atlas pls 89-95. Note: Part of *Voyage Autour Du monde...Exécuté sur les corvettes de S. M. l'Uranie et la Physicienne pendant les années 1817, 1818, 1819 et 1820...par M. Louis de Freycinet*. The zoological reports comprised two volumes: text (ic + 712 p); and Atlas (96 pl.). According to Sherborn & Woodward (*Annals and Magazine of Natural History Series 7*, Vol. 7, p. 392), pp. 603-616 (Livre 14) appeared in December 1825, and pp. 617-643 (Livre 15) appeared in April 1826; data on plates not provided.
- LAMOUREUX J.V.F., BORY DE SAINT-VINCENT J.B. & EUDES-DESLONGCHAMPS J.A., 1824 — *Encyclopédie Méthodique. Histoire Naturelle des Zoophytes ou Animaux Rayonnés*. Paris, Veuve Agasse, viii + 819 p.
- LAMY D. & WOELKERLING W.J., 1998 — The Muséum National d'Histoire Naturelle and coralline systematics. In: Woelkerling W.J. & Lamy D. (ed.), *Non-geniculate Coralline Red Algae and the Paris Muséum: Systematics and Scientific History*. Paris, Publications Scientifique du Muséum/ADAC, pp. 15 – 242, addendum, pp. 685 - 686.
- LEE Y. & KANG S., 2001 — *A Catalogue of the Seaweeds in Korea*. Cheju, Korea, Cheju National University Press, [v] + 662 p.
- LEMMERMANN E., 1907 — Die Algenflora der Chatham Islds. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 38: 343-382, pl. 45-46.
- LEMOINE M., 1912 — Catalogue des mélobésiées de l'Herbier Thuret (Muséum National d'Histoire Naturelle à Paris). *Bulletin de la Société Botanique de France* 58: LI-LXV. Effective publication date: Jan. 1912 (stated on cover of offprint); offprint issued without change in pagination. Author listed as Mme P. Lemoine in publication.
- LEMOINE M., 1913 — Mélobésiées. Revision des Mélobésiées Antarctiques. In: *Deuxième Expédition Antarctique Française (1908-1910) Commandée par le Dr Jean Charcot. Sciences Naturelles*. Vol. 1. Botanique. Paris, Masson et Cie, 67 p., 2 pl. Note: Author listed as Mme P. Lemoine in the publication.
- LEMOINE M., 1915a — Calcareous algae. *Report on the Danish Oceanographical Expeditions 1908-1910 to the Mediterranean and Adjacent Seas* 2(K1): 1-30, 1 pl. Note: Author listed as Mme P. Lemoine in the publication.
- LEMOINE M., 1915b — Melobesiaceae. *The Journal of the Linnean Society (Botany)* 43: 193-200, pl. 9-10. Effective publication date: Nov. 1915 (date of journal issue stated on

- offprint). Note: part of Cotton A.D. 1915 — Cryptogams from the Falkland Islands collected by Mrs. Vallentin. *The Journal of the Linnean Society, Botany* 43: 137-231, pl. 4-10. Lemoine contribution also issued as an offprint without change in pagination. Author listed as Mme P. Lemoine in the publication.
- LEMOINE M., 1917 — Melobesieae. *British Antarctic ("Terra Nova") Expedition, 1910 Natural History Report, Botany* 2: 23-25. Note: part of Gepp. A. and Gepp. E.S. 1917. Marine algae. *British Antarctic ("Terra Nova") Expedition, 1910 Natural History Report, Botany* 2: 17-28. Note: Author listed as Mme P. Lemoine in the publication.
- LEMOINE M., 1920 — Botanische Ergebnisse der schwedischen Expedition nach Patagonien und dem Feuerlande 1907-1909. VII. Les Mélobésiées. *Kungliga Svenska Vetenskapsakademiens Handlingar* 61(4): 1-17, 11 pl. Note: Author listed as Mme P. Lemoine in the publication.
- LEVRING T., 1944 — Meeresalgen von den Crozet Inseln und Kerguelen. *Arkiv för Botanik* 31A (8): 1-31.
- LEVRING T., 1945 — Marine algae from some Antarctic and Subantarctic islands. *Lunds Universitets Årsskrift* 41(7): 1-36, pl. I.
- LEVRING T., 1960 — Contributions to the marine algal flora of Chile. *Lunds Universitets Årsskrift* 56(10): 1-84.
- LINNAEUS C., 1758 — *Systema Naturae*. 10 edn. Vol. 1. Stockholm, L. Salvii, ii + 824 p.
- LITTLER D.S. & LITTLER M.M., 2000 — *Caribbean Reef Plants*. Washington, D.C., OffShore Graphics, 542 p.
- LITTLER D.S. & LITTLER M.M., 2003 — *South Pacific Reef Plants*. Washington, D.C., OffShore Graphics, 331 p.
- LUCAS A.H.S. & PERRIN F., 1947 — *The Seaweeds of South Australia. Part II. The Red Seaweeds*. Adelaide, Government Printer, [iii] + pp. 113-458.
- MAGRUDER W.H. & HUNT J.W., 1979 — *Seaweeds of Hawaii*. Honolulu, Hawaii, Oriental Publishing Co., 116 p.
- MASAKI T., 1968 — Studies on the Melobesioideae of Japan. *Memoirs of the Faculty of Fisheries Hokkaido University* 16: 1-80, pl. 1-79.
- MASON L.R., 1953 — The crustaceous coralline algae of the Pacific Coast of the United States, Canada and Alaska. *University of California Publications in Botany* 26: 313-390, pl. 27-46.
- MAY D.I. & WOELKERLING W.J., 1988 — Studies on the genus *Synarthrophyton* (Corallinales, Rhodophyta) and its type species, *S. patena* (J.D. Hooker et W.H. Harvey) Townsend. *Phycologia* 26: 50-71.
- MAZZA A., 1916-1922 — *Saggio di Algologia Oceanica*. Vol. 3. Padova, Italy, Seminario, pp. 1057-1584.
- MAZZA A., 1917 — Saggio di algologia oceanica. *Nouva Notarisia* 28: 70-110.
- MAZZA A., 1918 — Saggio algologia oceanica. *Nouva Notarisia* 29: 57-112.
- MENDOZA M.L., 1999 — State of knowledge of the Corallinales (Rhodophyta) of Tierra del Fuego and the Antarctic Peninsula. *Scientia Marina* 63, Suppl. 1: 139-144.
- MENDOZA M.L., MOLINA S. & VENTURA P., 1996 — Rhodophyta: Orden Corallinales. *Flora Criptogámica de Tierra del Fuego* 8 (3): 1-72.
- MENESES I. & RAMIREZ M.E., 1984 — *Synarthrophyton patena* (Hooker F. et Harvey) Townsend en isla Elefante, Shetland del Sur, Antártica (Rhodophyta, Cryptonemiales). *Instituto Antártico Chileno Serie Científica* 31: 67-74.
- MILLAR A.J.K., 1990 — Marine red algae of the Coffs Harbour region, northern New South Wales. *Australian Systematic Botany* 3: 293-593.
- MILLAR A.J.K. & KRAFT G.T., 1993 — Catalogue of marine and freshwater red algae (Rhodophyta) of New South Wales, including Lord Howe Island, South-western Pacific. *Australian Systematic Botany* 6: 1-90.
- MILLER C., NELSON W.A. & PARSONS M.J., 2000 — *Unpacking Levring – the collections returned to New Zealand*. Wellington, New Zealand, Museum of New Zealand Te Papa Tongarewa, 68 p. Note: Technical Report 37.
- MINDER F., 1910 — *Die Fruchtentwicklung von Choreonema thureti*. Bad Neuheim, Germany, Oberh. Ztg. Genossenschaft, 32 p., 1 pl.

- MONTAGNE C., 1845 — *Plantes cellulaires. Voyage au Pôle Sud et dans l'Océanie sur les corvettes l'Astrolabe et la Zélée sous le commandement de J. Dumont D'Urville. Botanique*. Vol. 1. Paris, Gide, xiv + 349 p., 20 pl.
- MONTAGNE C., 1856 — *Sylloge Generum Specierumque Cryptogamarum*. Paris, J.-B. Baillière, xxiv + 498 p.
- MOURA C.W.N. & YAMAGUISHI-TOMITA N., 1998 — *Jania ungulata* f. *brevior* (Corallinales, Rhodophyta): nova ocorrência para o Atlântico. *Hidrobiologica* 8: 145-153.
- MOURA C.W.N. & GUIMARÃES, S.M.P.B., 2002 — O gênero *Cheilosporum* (Decaisne) Zanardini (Corallinales, Rhodophyta) no litoral do Brasil. *Revista Brasileira de Botânica* 25: 65-77.
- MUELLER F., 1871 — On some algae from the Chatham Islands. *Transactions and Proceedings of the New Zealand Institute* 3: 213-215.
- MUELLER F., 1874 — List of the algae of the Chatham Islands, collected by H.H. Travers, Esq. and examined by Professor John Agardh of Lund. *Transactions and Proceedings of the New Zealand Institute* 6: 208-210.
- NAYLOR M., 1954 — A checklist of the marine algae of the Dunedin district. *Transactions of the Royal Society of New Zealand* 82: 645-663.
- NEALE D. & NELSON W., 1998 — Marine algae of the west coast, South Island, New Zealand. *Tuhinga* 10: 87-118.
- NELSON W.A., 2002 — In the pink — new coralline algae program. *Aquatic Biodiversity Biosecurity* 2002 (issue 2): 1. (Note: published by the National Institute of Water and Atmospheric Research Limited, ISSN 1175-9135).
- NELSON W.A. & ADAMS N.M., 1984 — The marine algae of the Kermadec Islands - a list of species. *National Museum of New Zealand Miscellaneous Series* 10: 1-29.
- NELSON W.A. & ADAMS N.M., 1987 — Marine algae of the Bay of Islands area. *National Museum of New Zealand Miscellaneous Series* 16: 1-47.
- NELSON W.A., ADAMS N.M. & FOX J.M., 1992 — Marine algae of the northern South Island. *National Museum of New Zealand Miscellaneous Series* 26: 1-79 + 1 pl.
- NELSON W.A., ADAMS N.M. & HAY C.H., 1991 — Marine algae of the Chatham Islands. *National Museum of New Zealand Miscellaneous Series* 23: 1-58.
- NELSON W.A. & PHILLIPS L., 1996 — The Lindauer legacy - current names for the Algae Nova Zelandicae Exsiccatae. *New Zealand Journal of Botany* 34: 553-582.
- NELSON W.A., PHILLIPS L.E. & ADAMS N.M., 1998 — Algal type material and historical phycological collections in the Museum of New Zealand Te Papa Tongarewa. *Tuhinga* 10: 63-85.
- NELSON W.A., VILLOUTA E., NEILL K.F., WILLIAMS G.C., ADAMS N.M. & SLIVS-GAARD R., 2002 — Marine macroalgae of Fiordland, New Zealand. *Tuhinga* 13: 117-152.
- OKAMURA K., 1932 — The distribution of marine algae in Pacific waters. *Records of Oceanographic Works in Japan* 4: 30-150.
- OLIVER W.R.B., 1923 — Marine littoral plant and animal communities in New Zealand. *Transactions of the New Zealand Institute* 54: 496-545.
- PALLAS P.S., 1766 — *Elenchus Zoophytorum*. Hague, P. van Cleef, [28] + 451 p.
- PAPENFUSS G.F., 1964 — Catalogue and bibliography of Antarctic and sub-Antarctic benthic marine algae. *Antarctic Research Series* 1: 1-76.
- PARK C.H., 1977 — Studies on the Melobesioideae of Korea (II). *Bulletin of National Fisheries University of Busan* 17: 59-70.
- PARK C.H., 1980 — The crustose coralline algae (Rhodophyta, Cryptonemiales) in Korea. *Bulletin of National Fisheries University of Busan* 20(1): 1-30.
- PARSONS M.J., 1985a — Biosystematics of the cryptogamic flora of New Zealand: algae. *New Zealand Journal of Botany* 23: 663-675.
- PARSONS M.J., 1985b — New Zealand seaweed flora and its relationships. *New Zealand Journal of Marine and Freshwater Research* 19: 131-138.
- PARSONS M.J. & FENWICK G.D., 1984 — Marine algae and a marine fungus from Open Bay Islands, Westland, New Zealand. *New Zealand Journal of Botany* 22: 425-432.

- PENROSE D., 1996a — Genus *Hydrolithon*. In: Womersley H.B.S. (ed.), *The Marine Benthic Flora of Southern Australia – Part IIIB. Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Canberra, Australian Biological Resources Study, pp. 255-266.
- PENROSE D., 1996b — Genus *Pneophyllum*. In: Womersley H.B.S. (Ed.), *The Marine Benthic Flora of Southern Australia – Part IIIB. Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Canberra, Australian Biological Resources Study, pp. 266-272.
- PENROSE D. & CHAMBERLAIN Y.M., 1993 — *Hydrolithon farinosum* (Lamouroux) comb. nov.: implications for generic concepts in the Mastophoroideae (Corallinales, Rhodophyta). *Phycologia* 32: 295-303.
- PENROSE D. & WOELKERLING W.J., 1991 — *Pneophyllum fragile* in southern Australia: implications for generic concepts in the Mastophoroideae (Corallinales, Rhodophyta). *Phycologia* 30: 495-506.
- PHILIPPI R.A., 1837 — Beweis dass die Nulliporen Pflanzen sind. *Archiv für Naturgeschichte* 3: 387-393, pl. 9, figs 2-6.
- POSTELS A. & RUPRECHT F., 1840 — *Illustrationes Algarum*. Petropoli, E. Pratz, iv + 24 p., 40 pl.
- PRICE J.H., 1984 — Bibliographic notes on works concerning the algae IV. Publication dates of parts of the *Phycologia Britannica* (1846-1851) of William Henry Harvey. *Archives of Natural History* 11: 431-442.
- PRICE J.H., 1988 — Goody two-shoes or a monument to industry? Aspects of the *Phycologia Britannica* of William Henry Harvey (1811 to 1866). *Bulletin of the British Museum (Natural History), Historical Series* 16: 87-216.
- PRINTZ H., 1929 — *M. Foslie - 'Contributions to a Monograph of the Lithothamnia'*. Trondhjem, Norway, Det Kongelige Norske Videnskabers Selskab Museet, 60 p., 75 pl.
- RABENHORST L., 1878 — Beitrag zur Merresalgen-flora der Auckland-Inseln. *Hedwigia* 17 (5): 66-77.
- RAMÍREZ M.E. & SANTELICES B., 1991 — Catálogo de las algas marinas bentónicas de la costa temperada del Pacífico de Sudamérica. *Monografías Biológicas* 5: 1-437.
- RAOUL M.E., 1846 — *Choix de Plantes de la Nouvelle-Zelande*. Paris, Fortin, Masson, and Cie, 53 p., 30 pl.
- REINBOLD T., 1899a — Meeresalgen von Investigator Street (Süd-Australien) gesammelt von Miss Nellie Davey (Waltham, Honiton). *Hedwigia* 38: 39-51.
- REINBOLD T., 1899b — Ergebnisse einer reise nach dem Pacific (Prof. Dr. Schauinsland 1896/97). Meeresalgen. *Jahresbericht des Naturwissenschaftlichen Vereines zu Bremen* 16: 287-300.
- REINBOLD T., 1900 — Meeresalgen von den Norfolk Inseln. *La Nuova Notarisia* 11: 147-153.
- RICKER R.W., 1987 — *Taxonomy and Biogeography of Macquarie Island Seaweeds*. London, British Museum (Natural History), viii + 344 p.
- RINGELTAUBE P. & HARVEY A., 2000 — Non-geniculate coralline algae (Corallinales, Rhodophyta) on Heron Island, Great Barrier Reef (Australia). *Botanica Marina* 43: 431-454.
- ROSANOFF S., 1866 — Recherches anatomiques sur les Mélobésiées. *Mémoires de la Société Impériale des Sciences Naturelles de Cherbourg* 12: 5-112, pl. 1-7. Note: also published in book form.
- SAYRE G., 1969 — Cryptogamae Exsiccatae - An annotated bibliography of published exsiccatae of algae, lichenes, hepaticae, and musci. *Memoirs of the New York Botanical Garden* 19(1): 1-174.
- SCHMITZ F., 1889 — Systematische Übersicht der bisher Bekannten Gattungen der Florideen. *Flora* 72: 435-456, pl. 21. Note: synopsis of paper subsequently published in *La Nuova Notarisia* 1: 103-116 (1890).
- SEAGRIEF S.C., 1984 — A catalogue of South African green, brown and red marine algae. *Memoirs of the Botanical Survey of South Africa* 47: i-vi, 1-72.

- SILVA P.C., BASSON P.W. & MOE R.L., 1996 — *Catalogue of the Benthic marine Algae of the Indian Ocean*. Berkeley, University of California Press, xiv + 1129 p.
- SKELTON P.A. & SOUTH G.R., 2002 — Annotated catalogue of the benthic marine algae of the Palolo Deep National Marine Reserve of Samoa. *Australian Systematic Botany* 15: 135-179.
- SKOTTSBERG C., 1923 — Botanische Ergebnisse der Schwedischen Expedition nach Patagonien und dem Feuerlande 1907-1909. IX. Marine algae. 2. Rhodophyceae. *Kungliga Svenska Vetenskapsakademiens Handlingar* 63(8): 1-70.
- SKOTTSBERG C., 1941 — Communities of marine algae in subantarctic and Antarctic waters. *Kungliga Svenska Vetenskapsakademiens Handlingar* 19(4): 1-92, 3 pl.
- SONDER O.G., 1845 — Nova algarum genera et species, quasinin itinere ad oras occidentalis Novae Hollandiae, collegit. L. Preiss, Ph. Dr. *Botanische Zeitung* 3: 49-57.
- SOUTH G.R. & ADAMS N.M., 1976 — Marine algae of the Kaikoura coast. *National Museum of New Zealand Miscellaneous Series* 1: 1-67, index, map.
- SOUTH G.R. & KASAHARA H., 1992 — A preliminary checklist of the benthic marine algae of the Fiji Islands, South Pacific. *Micronesica* 25: 41-70.
- STAFLEU F.A. & COWAN R.S., 1979 — *Taxonomic Literature*. 2 ed., Vol. II: H-Le. Utrecht, Bohn, Scheltema and Holkema, xviii + 991 p. Note: Vol. 98 in the series *Regnum Vegetabile*.
- STAFLEU F.A. & COWAN R.S., 1983 — *Taxonomic Literature*. 2 ed., Vol. IV: P-Sak. Utrecht, Bohn, Scheltema and Holkema, ix + 1214 p. Note: Vol. 110 in the series *Regnum Vegetabile*.
- STAFLEU F.A. & COWAN R.S., 1988 — *Taxonomic Literature*. 2 ed., Vol. VII: W-Z. Utrecht, Bohn, Scheltema and Holkema, lvi + 653 p. Note: Vol. 116 in the series *Regnum Vegetabile*.
- STAFLEU F.A. & MENNEGA E.A., 1998 — *Taxonomic Literature Supplement V: Da-Di*. Königstein, Germany, Koeltz Scientific Books, viii + 432 p. Note: Vol. 135 in the series *Regnum Vegetabile*.
- STEARN W.T., 1981 — *The Natural History Museum at South Kensington*. London, W. Heinemann, xxiii + 414 p.
- STEGENGA H., BOLTON J.J., & ANDERSON R.J., 1997 — *Seaweeds of the South African West Coast*. Cape Town, Bolus Herbarium, 655 p. Note: Contributions from the Bolus Herbarium, Number 18.
- TAYLOR W.R., 1945 — Pacific marine algae of the Allan Hancock expeditions to the Galapagos Islands. *Allan Hancock Pacific Expeditions* 12: 1-528.
- TAYLOR W.R., 1960 — *Marine Algae of the Eastern Tropical and Subtropical Coasts of the Americas*. Ann Arbor, Michigan, University of Michigan Press, ix + 860 p.
- THURET G. & BORNET E., 1878 — *Études Phycologiques*. Paris, G. Masson, iii + 105 p., 51 pl.
- TITTLE I., IRVINE L. & KARTAWICK T., 1984 — *Catalogue of Type Specimens and Geographical Index to the Collections of Rhodophyta (red algae) at the British Museum (Natural History)*. London, British Museum (Natural History), 64 p.
- TOWNSEND R.A., 1979 — *Synarthrophyton*, a new genus of Corallinaceae (Cryptonemiales, Rhodophyta) from the southern Hemisphere. *Journal of Phycology* 15: 251-259.
- TSENG C.K., 1984 — *Common Seaweeds of China*. Beijing, China, Science Press, x + 316 p.
- TSUDA R.T., 1991 — Catalog of the marine benthic algae from the Ryukyu Islands, Japan. *Galaxea* 10: 35-64.
- TURNER J.A. & WOELKERLING W.J., 1982a — Studies on the *Mastophora - Lithoporella* complex (Corallinaceae, Rhodophyta). I. Meristems and thallus structure and development. *Phycologia* 21: 201-217.
- TURNER J.A. & WOELKERLING W.J., 1982b — Studies on the *Mastophora - Lithoporella* complex (Corallinaceae, Rhodophyta). II. Reproduction and generic concepts. *Phycologia* 21: 218-235.
- UNGER F., 1858 — Beiträge zur näheren Kenntniss des Leithakalkes. *Denkschriften der Kaiserlichen Akademie der Wissenschaften* 14: 13-38, pl. 15-16.

- URBAN I., 1916 — *Geschichte des Königlichen Botanischen Museums zu Berlin-Dahlem (1813-1913) nebst Aufzählung seiner Sammlungen*. Dresden, C. Heinrich, 456 p.
- WEBER-VAN BOSSE A., 1904 — Corallineae verae of the Malay Archipelago. *Siboga Expeditie* 61: 78-110, pl. 14-16. Part of: Weber-van Bosse A. & Foslie M. 1904 — The Corallineae of the Siboga expedition. *Siboga Expeditie* 61: 1-110, pl. 1-16.
- WIENCKE C. & CLAYTON M.N., 2002 — *Antarctic Seaweeds*. Ruggell, Lichtenstein, A.R.G. Gantner Verlag., 239 p. Note: Vol. 9 in the series *Synopses of the Antarctic Benthos*, edited by J.W. Wägele.
- WILKS K.M. & WOELKERLING W.J., 1991 — Southern Australian species of *Melobesia* (Corallinaceae, Rhodophyta). *Phycologia* 30: 507-533.
- WILKS K.M. & WOELKERLING W.J., 1994 — An account of southern Australian species of *Phymatolithon* (Corallinaceae, Rhodophyta) with comments on *Leptophyllum*. *Australian Systematic Botany* 7: 183-223.
- WILKS K.M. & WOELKERLING W.J., 1995 — An account of southern Australian species of *Lithothamnion* (Corallinaceae, Rhodophyta). *Australian Systematic Botany* 8: 549-583.
- WOELKERLING W.J., 1983a — A taxonomic reassessment of *Lithothamnium* Philippi (Corallinaceae, Rhodophyta) based on studies of R.A. Philippi's original collections. *British Phycological Journal* 18: 165-197.
- WOELKERLING W.J., 1983b — A taxonomic reassessment of *Lithophyllum* Philippi (Corallinaceae, Rhodophyta) based on studies of R.A. Philippi's original collections. *British Phycological Journal* 18: 299-328.
- WOELKERLING W.J., 1987 — The genus *Choreonema* in southern Australia and its subfamilial classification within the Corallinaceae (Rhodophyta). *Phycologia* 26: 111-127.
- WOELKERLING W.J., 1988 — *The Coralline Red Algae: An Analysis of the Genera and Subfamilies of Nongeniculate Corallinaceae*. London and Oxford, British Museum (Natural History) and Oxford University Press, xi + 268 p.
- WOELKERLING W.J., 1993 — Type collections of Corallinales (Rhodophyta) in the Foslie Herbarium (TRH). *Gunneria* 67: 1-289.
- WOELKERLING W.J., 1996a — Subfamily Melobesioideae. In: Womersley H.B.S. (Ed.) *The Marine Benthic Flora of Southern Australia – Part IIIB. Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Canberra, Australian Biological Resources Study, pp. 164-210.
- WOELKERLING W.J., 1996b — Subfamily Mastophoroideae (excluding *Hydrolithon*, *Pneophyllum*, *Spongites* & *Neogoniolithon*). In: Womersley H.B.S. (Ed.) *The Marine Benthic Flora of Southern Australia – Part IIIB. Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Canberra, Australian Biological Resources Study, pp. 237-255.
- WOELKERLING W.J., 1997 — The biodiversity of Corallinales (Rhodophyta) in southern Australia: 1976 vs 1996 with implications for generating a world biodiversity database. *Cryptogamie Algologie* 18: 225-261.
- WOELKERLING W.J., 1998a — Introduction. In: Woelkerling W.J. & Lamy D. (ed.), *Nongeniculate Coralline Red Algae and the Paris Muséum: Systematics and Scientific History*. Paris, Publications Scientifique du Muséum/ADAC, pp. 11-14.
- WOELKERLING W.J., 1998b — Lamarck's Nullipores. In: Woelkerling W.J. & Lamy D. (ed.), *Nongeniculate Coralline Red Algae and the Paris Muséum: Systematics and Scientific History*. Paris, Publications Scientifique du Muséum/ADAC, pp. 243-278.
- WOELKERLING W.J., 1998c — Type Collections of non-geniculate Corallinales housed at the Laboratoire de Cryptogamie (PC). In: Woelkerling W.J. & Lamy D. (ed.), *Nongeniculate Coralline Red Algae and the Paris Muséum: Systematics and Scientific History*. Paris, Publications Scientifique du Muséum/ADAC, pp. 279-404.
- WOELKERLING W.J. & CAMPBELL S.J., 1992 — An account of southern Australian species of *Lithophyllum* (Corallinaceae, Rhodophyta). *Bulletin of the British Museum (Natural History), Botany* 22: 1-107.
- WOELKERLING W.J., CHAMBERLAIN Y.M. & SILVA P.C., 1985 — A taxonomic and nomenclatural reassessment of *Tenarea*, *Titanoderma* and *Dermatolithon*

- (Corallinaceae, Rhodophyta) based on studies of type and other critical specimens. *Phycologia* 24: 317-337.
- WOELKERLING W.J. & FOSTER M.S., 1989 — A systematic and ecographic account of *Synarthrophyton schielianum* sp. nov. (Corallinaceae, Rhodophyta) from the Chatham Islands. *Phycologia* 28: 39-60.
- WOELKERLING W.J. & HARVEY A., 1992 — *Mesophyllum incisum* (Corallinaceae, Rhodophyta) in southern Australia: implications for generic and specific delimitation in the Melobesioideae. *British Phycological Journal* 27: 381-399.
- WOELKERLING W.J. & HARVEY A., 1993 — An account of southern Australian species of *Mesophyllum* (Corallinaceae, Rhodophyta). *Australian Systematic Botany* 6: 571-637.
- WOELKERLING W.J. & IRVINE L.M., 1982 — The genus *Schmitziella* Bornet et Batters (Rhodophyta): Corallinaceae or Acrochaetiaceae? *British Phycological Journal* 17: 275-295.
- WOELKERLING W.J. & IRVINE L.M., 1986 — The neotypification and status of *Phymatolithon* (Corallinaceae, Rhodophyta). *British Phycological Journal* 21: 55-80.
- WOELKERLING W.J. & VERHEIJ E., 1995 — Type collections of nongeniculate Corallinales (Rhodophyta) in the Rijksherbarium, Rijksuniversiteit Te Leiden (L), the Netherlands. *Blumea* 40: 33-90.
- WOMERSLEY H.B.S., 1966 — Algae (Port Phillip Survey). *Memoirs of the National Museum of Victoria* 27: 133-156.
- WOMERSLEY H.B.S., 1996 — *The Marine Benthic Flora of Southern Australia – Part IIIB. Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Canberra, Australian Biological Resources Study, 392 p.
- WOMERSLEY H.B.S. & JOHANSEN H.W., 1988 — The genus *Arthrocardia* (Corallinaceae: Rhodophyta) in southern Australia. *Transactions of the Royal Society of South Australia* 112: 39-49.
- WOMERSLEY H.B.S. & JOHANSEN H.W., 1996a — Subfamily Amphiroideae. In: Womersley H.B.S. (ed.), *The Marine Benthic Flora of Southern Australia – Part IIIB. Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Canberra, Australian Biological Resources Study, pp. 283-288.
- WOMERSLEY H.B.S. & JOHANSEN H.W., 1996b — Subfamily Corallinoideae. In: WOMERSLEY H.B.S. (Ed.), *The Marine Benthic Flora of Southern Australia – Part IIIB. Gracilariales, Rhodymeniales, Corallinales and Bonnemaisoniales*. Canberra, Australian Biological Resources Study, pp. 288-317.
- YENDO K., 1902a — Corallinae verae Japonicae. *The Journal of the College of Science, Imperial University of Tokyo* 16(3): 1-36, pl. 1-7.
- YENDO K., 1902b — Enumeration of corallineaceous Algae hitherto known from Japan. *The Botanical Magazine, Tokyo* 17: 185-196.
- YENDO K., 1905 — A revised list of corallinae. *The Journal of the College of Science, Imperial University of Tokyo* 20(12): 1-46.
- YOSHIDA T., 1998 — *Marine Algae of Japan*. Tokyo, Uchida Rokakuho Publishing Co., 25 + 1 222 p.
- ZANARDINI G., 1840a — Species algarum novae vel minus cognitae. *Biblioteca Italiana* 96: 134-137.
- ZANARDINI G., 1840b — Spora le alghe del mare Adriatico. Lettera seconda. *Biblioteca Italiana* 99: 195-229.
- ZANEVELD J.S. & SANFORD R.B., 1980 — Crustose corallineaceous algae (Rhodophyta) of the New Zealand and United States scientific expedition to the Ross Sea, Balleny Islands, and Macquarie Ridge, 1965. *Blumea* 26: 205-231.
- ZHANG D. & ZHOU J., 1980 — Studies on the Corallinaceae of the Xisha Islands, Guangdong Province, China. II. *Studia Marina Sinica* 1980(12): 71-74, pl. 1-2.