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THE MARINE ALGAE OF KANGAROO ISLAND
III. LIST OF SPECIES, 1

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THE MARINE ALGAE OF KAINGAROO ISLAND

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SUMMARY

Four hundred and one species of marine algae are recorded from Kaingaroo Island, South Australia, together with comprehensive references, and notes on many species.

INTRODUCTION

This paper records 401 species of marine algae (Chrysophyta 26, Chlorophyta 106, Phaeophyta 96, Rhodophyta 233) from Kaingaroo Island. Records derived from a small collection from the "south coast," made by J. C. Goll in the winter of 1933, and also records given by C. J. and B. C. from September 1934 (determined by H. H. S. Lucas) have been incorporated.

Further species will be recorded in a second list, as over 100 remain undetermined, some of which are as yet undescribed. Kaingaroo Island is a very rich region for marine algae, and although extensive collections have been made during the last five years, doubtless more species remain to be discovered in localities which have not been thoroughly investigated.

Over 100 species comprise new records for the State of South Australia, but as Southern Australia forms a distinct geographic region (with probably 35-40% of species occurring from Tasmania to Western Australia), and so few localities have been thoroughly examined, such new records have little significance for the present and have not been indicated.

The specimens on which this list is based are deposited in the Algal Herbarium of the Botany Department, University of Adelaide.

Visits were made to Kaingaroo Island at the following times: 1944, January; 1945, January, May; 1946, January, August; 1947, January, April, May, June, July, October, November; 1948, January, September, December; 1949, January.

In determining the species in this list reference has been made wherever possible to original literature, and to authentic specimens in Australian Herbaria, especially the Melbourne National Herbarium. Unfortunately, few type specimens of Australian algae exist in Australia, making sure determinations very difficult in many cases; and many other species in Herbaria are incorrectly listed, so that comparisons with specimens other than the type have to be done with caution. Melbourne National Herbarium fortunately possesses O. W. S wrapper's Australian collection, including his type specimens, and also a set of W. H. Harvey's Australian algae, J. A. Garden's "Algae Mediterranean" and duplicates of J. B. Wilson's collection. The Adelaide University Herbarium possesses a few of T. R. E. Echols' etudes from Investigator Strait. It is evident, however, that extensive series of nearly all Australian species should be checked with the type specimens, and also with related species to define limits of variability. Many other species, such as those of Zanardini, are very poorly known, and require re-examination of the original specimens. Until this can be done some determinations must necessarily be provisional, and descriptions of new species must await comparison with authentic material of closely related species.

In this list notes on the habitat of each species are given where possible. The ecological terms used have been defined in Pt. I of this series (Womersley 1947), and references to Pt. I and Pt. II apply to this and the second paper (Womersley 1948). Where a species is listed as from the drift (i.e., found cast up or floating), it almost certainly grows in the subtidal, as the littoral are.

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upper sublittoral have been extensively collected in most localities and are listed as such. The month (abbreviated) and year of most collection are given, as this gives positive evidence of the seasonal occurrence of many species (and also facilitates future reference to the specimens in the herbarium). In many cases, especially at Pennington Bay and American River inlet where the seasonal occurrence of many species is comparatively well known it has been possible to generalize and give the period of their occurrence. However, probably the majority of species known from a few records are present during all seasons.

Although positive records only are given, generalizations about the distributions of many species around the islands can be made. Thus species found at Pennington Bay or Vivonne Bay probably occur in similar habitats anywhere along the south and west coasts. In fact, the formations and subformations described in Pt. 1 are usually broad habitat regions.

No attempt has been made to give a complete list of references to the species, nor in some cases is the reference to the original description given. A selection has been made of the more important and useful references, especially those available to the author, and De Toni in most cases gives fairly complete lists.

Throughout this series of papers Recommendation XLIII of the 1935 Botanical Rules referring to the use of capital letters for generic and certain other specific names has not been followed. I am in full agreement with the reasons expressed for this in the Journal of Ecology, 31, (1943), p. 93.

The following authors have been followed in the classification adopted: Cyanophyta (Fritsch 1967), Chlorophyta and Phaeophyta (Smith 1938, Pappen- fuss 1947 a), Rhodophyta (Kylin 1924, 1931, 1932, Folkenberg 1901, and Fritsch 1945).

The localities have been abbreviated to the first letters of the names, as in the list below. The order of localities is from American River inlet along the north, west, south and east coasts and back to American River inlet (see fig. 1, Pt. 1). Brief notes on the areas examined are also given below, and reference should be made to Pt. I and II for further details.

NORTH COAST—

AR, American River inlet: an extensive tidal inlet (not a river) with small islands (Slag Rock, Pig, Wallaby Islands) in Pelican Lagoon. BH, Bussel Head: a rocky headland immediately north of American River inlet. The east side only has been examined. X, Kingcups. RS, Bay of Shoals: a shallow sandy bay with calm conditions. EB, Emu Bay: the rocky coast near the old lory was examined. SS, Stakes Bay. MR, Middle River: the mouth is normally closed by a sand bar and rocky coast occurs at both ends of a sandy beach. WR, Western River: the river mouth is also usually closed by a sandy bar. HR, Harvey’s Return: about four miles east of Cape Borda.

WEST COAST—

WB, West Bay.

SOUTH COAST—

CC, Cape Condie. PB, Vivonne Bay: rock platforms occur within the bay while the western extremity—Ellen Point—is of steeply sloping rock. Posts 1 and 2 are referred to in Pt. I, p. 245. DB, D’Estrees Bay: reefs briefly examined are at the eastern end of the bay. PB, Pennington Bay: see Pt. II CW, Cape Willoughby.

EAST COAST—

AB, Anamahoney Bay: The rocky area at the north end of the bay was examined. HE, Hog Bay.
ACKNOWLEDGMENTS

In addition to the acknowledgments made in Pt. I, I would like to thank further Mr. A. W. Jarrup, of the Melbourne National Herbarium, for the list of specimens and literature. Dr. G. F. Parkinson, of the Department of Botany, University of California, has kindly made information available and given opinions on certain species. Both Dr. C. B. Ellis, of Sweden, and Dr. V. J. Chapman have given opinions on the species of Entomophila.

CYANOPHYTA

CHROOCOCCALES — CHROOCOCCACEAE

COCCOCOCHLORIS Speculatus


ENTOMOPHYTA Finoing


PLEUROCAPSALIS — PLEUROCAPSACEAE

DERMOCAPSA Gomont

DERMOCAPSA BERNARDI (Thuret) Bernard. Xerococcus stenograph Thuret in Bernard and Thuret 1880, 74, pl. 26, f. 1, 2. Tilden 1910, 50, pl. 3, f. 7. Rabenhorst 1932, 335, f. 170.— AB. In littoral rock crevices, Jan. 1946.

OSTOCALIS — OSTARICALES

HYDROCOCCUM H. Kützing

HYDROCOCCUM ZACHARILEXON (Montagne) Gomont 1892, (Pt. 1), 335, pl. 12, f. 1, 2. Tilden 1910, 135, pl. 5, f. 57. Rabenhorst 1932, 1,148, f. 735.

Clearex Wulfsbe Harvey 1861, syn. n. 72, Alg. Aus. exc. n. 590.— AB. Lower littoral, on well-washed rock, Dec. 1948.

HYDROCOCCUM COMODES (Harvey) Gomont 1892, (Pt. 1), 335, pl. 12, f. 3, 4, Tilden 1910, 135, pl. 12, f. 55. Rabenhorst 1932, 1,148, f. 756. Clearex comodes Harvey 1861, syn. n. 73, Alg. Aus. exc. n. 597, 598.— VB, Edge of rock pool, south side of Zennor Pt., May 1945.


LYNGBYA Agardh


PLECTONEMA Theuer


SYMPLOCA Klützing


RYVULACAEAE

CALOTHRix Agardh


ISACTIS TIMMEL


RUVULARIA AGARDH


RUVULARIA FLAVA Womersley 1946a, 130, f. 2A, B. — Ee. south west and rougher parts of the north coast, in middle and upper littoral, all seasons, but variable in occurrence and amount.


STIGMONEMATACEAE

BRACHYTRECIA ZOOGONIA


CHLOROPHYTA

ULOTRICHALES — ULOTIRICACEAE

ULOTIRIX EXILIS Kützing 1849, 349. Setchell and Gardner 1920, 283. Smith 1946, 34. — AR. As a green band along the waterfront on boats anchored near American River jetty, Aug. 1943. Seasonal occurrence (from local information), March to Nov. These speeimens agree well with the above descriptions, but I have not seen authentic material. There seems to be some difference of opinion as to whether the marine species should be known as U. implicata or U. subflustra Wille. Setchell and Gardner are followed in referring it to U. implicata.

ULVALIS — ULVACEAE

ULVA LACTUA Linn. Setchell and Gardner 1920, 265. Smith 1944, 45. Taylor 1937, 75 — AR. On tidal flats (low littoral and upper sublittoral),
common, all seasons. South West River mouth, Dec. 1934 (Cleland and Black). P.B. Less rough parts of the reefs and rear littoral, all seasons. Also found in almost any suitable habitat elsewhere around the island. In AR specimens the thallus is 33-70 µ thick, with the cells in transverse section 1-15 times as high as broad. In PB specimens the thallus is 40-60 (70-4) thick, cells as high (1-15) times as broad. In size and form the AR specimens often approach var. latiurina De Candolle, while the PB specimens are similar to var. vigida (C.Ag.) Le Jol. However, the great variation in size and form between specimens in the same and different localities (from expanded plates to elongate undulate ribbons), prevents any valid separation of varieties.

**ENTEROMORPHA**

**Link**

This genus is notoriously difficult, and only some of the more distinct forms from Kangaroo Island are listed here. I have received opinions on the species from Dr V. J. Chapman and also from Dr C. Blettig whose culture experiments in Sweden have shown that some species include a number of forms. Until it is possible to carry out similar culture and separation experiments with Kangaroo Island Enteromorpha's, the limits of some species must remain uncertain.

**ENTEROMORPHA ACANTHOPHORA** Kützing 1856, t. 34, f. 1. J. Agardh 1883, 158. De Toni 1889, 135. — P.B. Rear littoral on reefs, all seasons but best developed in winter. These forms are only 1-4 cm. high, but resemble Kützing's figure and New Zealand specimens in form and structure.


The material from American River inlet is very variable and is referred by Dr Chapman to a number of forms. The variations seem, however, to be ecological in nature, depending on degree of exposure and water movements, and probably nearly all the American River forms are best placed under one species, as Dr. Blettig would do. Culture experiments with these forms are necessary for a full understanding of the problem. The form of Blding's Types I, II, and III are represented at American River inlet.


**BILDINGIA** Kylin


**CLADOPHORALES** — **CLADOPHORACEAE**

**CLADOPHORA** Kützing


CLADODIUMA PARTELLARIS (Mertens) Kittling 1941, 268, 1849, 393. De Toni 1889, 316. Borgen 1946, 51. — AR. Widely, but often sparingly, distributed in the upper sublittoral throughout the lake, and on the bays near American River jetty, all seasons. BH. Upper sublittoral. Oct. 1947. PB. In mid littoral rock pool on western serrated reef, Jan. 1946. The branching of AR specimens is very much less, and they appear more slender, than those from BH and PB. Filaments slender, however, are similar in all specimens, and the faceted branching is well developed in all.


CHARTOMORPHA Kittling


CHARTOMORPHA VALENS (Hooker and Harvey) Kittling 1849, 379. De Toni 1920, 274. Conferences cited Hooker and Harvey 1857, 416. — AR. Upper sublittoral on Rabbit Island and elsewhere in Pelican Lagoon and near Mokulen, not common, May 1947, Aug. 1948. This agrees well with a specimen from Tasmania of Conferences spumae H. & H. in Melbourne National Herbarium. The plant is dark green, forming rather coarse tufted masses, not readily exfoliating out of water; filaments 350-450 μ thick, cells mostly 12-24 μ in size, slightly inflated. It is a distinctly more robust plant than C. Linnum, readily distinguished in the field.

SIPHONOCALADIES — VALONIACEAE

DICTYOSPHAERIA Denecke

SIPHONOCALCACEAE

APXONIA Harvey


STUVUTA Sonder

STUVUTA PLUMOSA Sonder 1846, 151. Harvey 1858, pl. 32. De Toni 1889, 364. A single specimen from “North of Kangaroo Island, 1893.” Collector and further details are unknown.

BÜCHNELLACEAE

MICRODICTION Decaisne


DASYCALCACEAE

ACETABULARIA Lamouroux

ACETABULARIA MINICUS (R. Brown) Solens-Lahueth 1855, 27. Polyphysa MINICUS (R. Br.) Agardh. Harvey 1858, pl. 11. De Toni 1889, 421. — AR. Low littoral and upper sublittoral at head of the lagoon (dense in patches) and in Pelican Lagoon, all seasons. BS. Lower littoral, June 1944.

SIFONIALES — BRYOPHIAE

BRYOPSIS Lamouroux


The few specimens collected have been sterile. They agree well in form and structure with ocytops specimen of J. B. Wilson's in Melbourne National Herbarium except that the thallus of Wilson's specimens are nearly twice as wide (340-510a against 120-350a).

BRYOPSIS CEPHEUSOIDES Lamouroux. Kitting 1856, t. 79, f. 1. J. Agardh 1887, 29. De Toni 1889, 435. — AR. On buoy, Jan., Sept., 1946; upper sublittoral near American River jetty, July 1946. Best developed in winter. Dr. V. J. Chapman considers these plants are referable to B. cepheusoides, though they seem to be softer plants with longer pinnules than those figured by Kitting.


DEBERSSIEACEAE

DEBERSSIA Solier

Codiaceae

Codiun Galeatum

Corium Galeatum J. Agardh 1887, 42, t. 1, f. 1. De Toni 1889, 404. Lucas 1936, 54. — AR. Upper sublittoral throughout the year, occasional, all seasons. W.B. Drift, Jan. 1946. V.B. Drift, Jan. 1946, 1946, 1949. DB. Sublittoral fringe on reef, Jan. 1947. PB. Drift, and in sublittoral fringe, all seasons. RP. Drift, and pools of lower littoral, all seasons. Most of the specimens placed under C. galeatum show a distinctly but not intensely thickened top to the utricles. Some, such as those from American River, are very slightly thickened. Some specimens from Victor Harbour and other parts of the South Australian coast have extremely heavily thickened tops to the utricles, which tend to be narrower and contract a short distance below the apex. All these specimens are identical in external form (about plumes, thickness 4-6 mm. wide), and the variation in utricle thickness between young and old parts of one specimen, and between different specimens, is very considerable. Even when most utricles are scarcely thickened at all, an occasional narrow one occurs with heavy apical thickening.

Although the extremes in utricle thickness are very distinct, and such characters have been largely used in segregation of species within the genus, it seems impossible to delimit the extremes as species or even varieties. On the other hand this may be an ecological variation, as plants with heavily thickened utricles seem to occur mainly in deep water on exposed rocks.

A slender dichotomous Codium, 2-3 mm. in thickness, and with very slight utricle thickening has been found in the drift at Pennington and Vivonne Bays. This may be another form of C. galeatum, or may prove to be a distinct species.


Codiun Muelleri Kützing 1856, 34, t. 95, f. 2. J. Agardh 1887, 42. De Toni 1889, 403. Codium Schmidtii Vosk 1935, 9, pl. 1. — RP. Drift, June 1947, Aug. 1948. K. Drift, Jan. 1948. This species is distinguished by the presence of hemispherical thickenings on the internal side of the apical membrane of the utricles. This was first recorded in Vosk's Codium Schmidtii (from Bussleton, Western Australia, and Lefevre Peninsula near Adelaide, South Australia, not New Caladonia as given by Vosk), but Setchell (1940, 444) pointed out the type specimen of C. Muelleri Kützing shows the same feature although Kützing does not figure it. C. Muelleri in Melbourne National Herbarium show the thickenings distinctly. The plumes are slender (2-3 mm. wide) and such, becoming flat and membranous on drying out.

Most specimens in Australian Herbarium named as C. Muelleri do not show the internal thickening, and are not this species; some are probably forms of C. galeatum.


Rhizopodia filiformis (J. Agardh) A. and R. S. Gooch


Caulerpa racemosa

Caulerpa racemosa Endlicher. J. Agardh 1872, 28. De Toni 1889, 468. W. v. Bose 1890, 208. Lucas 1936, 42. — General in the lower littoral and sublittoral fringe within the exposed rocky coast formation (MR, west and south coasts to AB). Also drift from deeper water. All seasons, but often not common.


This species has been commonly known as C. reniformis. W. v. Bose showed that Harvey included two alga in his var. reniformis of C. reniformis, one of which is a loose form of that species, while the other has very much larger vesicles; this latter became C. echinata.

Caulerpa reniformis W. v. Bose 1910, 1-2. Lucas 1926, 559; 1936, 43. — This species was "dredged in 8 fathoms off Kangaroo Island by the fishermen's trawler Endavour in 1909." I have not collected it. The plant forms are densely covered with minute, several times dichotomous, ramula which are similar but slenderer than the succulents.


Var. crinifera (Harvey) orth. nov.


Considerable confusion has existed in the position of C. longifolia and C. harveyi. In Australian herbaria they have usually been regarded as distinct species, as did Lucus (1936). W. v. Bosse (1898, 295) examined the authentic (probably type) specimens of C. longifolia of C. Agardh, in the Paris Museum, and found it to be identical with C. harveyi P. v. M. W. v. Bosse considered the name C. harveyi as Agardh's original diagnosis was slightly erroneous. There is, however, no provision for this in the Botanica Nova (1924), and the name must therefore revert to the earlier C. longifolia C. Agardh.

The var. crinifera Harvey of C. harveyi P. v. M. has been commonly known in Australia as C. longifolia Agardh. Most specimens are very distinct from typical C. harveyi; they are smaller, much less robust, and have the ramets received inwards above and irregularly placed on the stem. Var. crinifera is an inhabitant of rock pools while C. harveyi (now C. longifolia) inhabits deeper water. From W. v. Bosse's description it appears that specimens of both C. longifolia and var. crinifera are present on the type sheet.

Most specimens of var. crinifera are very distinct from the species, but intermediate forms do occur, and Harvey claimed to have seen connecting stages between the deep water and rock pool forms. Several intermediate specimens occur in the slip collection of the Melbourne National Herbarium. C. longifolia J. Agardh from Port Philip (Wilson 1892, 188) is identical with var. crinifera, but is a known specimen as its description has ever been published. Several specimens of Wilson's are in the Melbourne National Herbarium.


Cyclidina demotys Sonder 1862, 660. Harvey 1889, pl. 107. W. v. Bosse 1898, 286. De Toni 1889, 446. = A.R. Upper sublittoral throughout lagoon, especially at edge of channel and in deeper holes, all seasons. K, Drift, Jan. 1945. CC, Drift, Jan. 1948. This species shows great seasonal variation in details of the lateral pinnae along the branches. In summer (Dec.-April) the pinnae are few, sometimes completely absent. In winter more pinnae develop, until in late winter (Aug.-Oct.) they are sufficiently close to just overlap. Harvey's figure shows as intermediate stage. The alga occurs in dense intertwined masses, often 1-2 ft. across.


CAULIFERA SIMPLIFICUSCULU (Turner) C. Agardh. Harvey 1859, pl. 65, f. 1, 2. De Toni 1889, 482. W. v. Bosse 1898, 377. Lucas 1936, 47. (no data). PB. In pools of sublittoral fringe on reefs, all seasons. VAR. VESICULIFERA Harvey 1859, descr. of pl. 65. W. v. Bosse 1898, 377. — AE. Upper sublittoral in lagoons, especially on edge of channel, all seasons. Under C. ephelae I have commented that Harvey confused two plants under his var. vesiculifera. W. v. Bosse renamed one C. ephelae and kept a form with more loosely placed vesicles (but of similar size to those of the species) as var. vesiculifera.

CAULIFERA TRIFARIA Harvey 1863, pl. 201. J. Agardh 1872, 16. De Toni 1889, 454. W. v. Bosse 1898, 299. Lucas 1936, 39. — South coast, collected by J. Cope, winter 1939 (probably drift). PB. Shaded pool of pool 1, south side of Ellen Point, Jan. 1948 (No. A969). PB. Shaded pools, rear littoral, main ref. Jan. 1946 (No. A7019). The specimens under A969 and A7019 are 1"-2" high and show two regular rows of ramets, never three. They are morphologically identical with C. serrulatiodes (Gm.) Howes. (C. plurimana Forsk.) However, specimens of C. trifaria sometimes have only two rows of ramets in parts, and this may be a feature of juvenile plants (as the VB and PB specimens probably are). C. trifaria also differs from C. serrulatiodes in having spines on the acrocarp. These are absent in these specimens, but this again may be a feature of young C. trifaria. For the present I prefer to leave these specimens under C. trifaria, though the possibility of their being C. serrulatiodes cannot be excluded.

In the Herbarium of the University of Adelaide is a specimen (A96) collected by Dr. Englehardt at Lacepede Bay in 1897, identified as Caulifera plumarti var. elegans (see Reinbold 1897, 44). This is also recorded by Lucas 1936, 35. Undersheet the specimen is written: "Examined and identified by Madamie Weber von Bosse," probably in Reinbold’s writing, as he dealt with Englehardt’s collection generally. W. v. Bosse (294) states in a footnote that she made the determination and adds: "Ceci repose sur une erreur, cet algue de M. Reinbold est le C. plurimana, mais un échantillon tres ramifie." The specimen, however, is a typical C. trifaria, with three rows of ramets in most parts.

C. serrulatiodes is characteristic of tropical waters, and on geographical grounds it would be unlikely to occur along Southern Australia.

PHAEOPHYTA

ISOGENERATAE — ECTOCARPACEAE — ECTOCARPACEAE

ECTOCARPUS CONVERVORENSIS (Roth) Le Jolli, Setchell and Gardner 1925, 412. Taylor 1937, 109. May 1940, 537-538. — AB. Common throughout the inlet, growing epiphytically on other algae (especially Hormosira) in winter (June-October), CC. In a rock pool, Jan. 1944. PB. Common in the rear littoral, winter (May-Nov.).

PYEALIELLA Bory


SPHACELARIALES — SPHACELARIACEAE


Stypocaulacaeae

HALOPTERIS Kützing


PHLEOCAULON Geyer


Cladostephaceae

CLADOSTEPHUS Agardh

CLADOSTEPHUS VENTICILLATUS (Lichtfoot) Agardh. De Toni 1895, 513. Lucas
1936, 105. Taylor 1937, 135, pl. 17, f. 9-11. — In the upper sublittoral zone within the Rocky Shore Formation, in wet washed but not extremely rough places (often sandy), all seasons. Common at RP, RF, BR, MR, PB, CW, WH.

CUTTERIALAE = COUTERIALAE

CUTTERIA Greville


DICTYOTALES — DICTYOTALES

DICTYOTACEAE

DICTYOTA APICULATA J. Agardh 1894a, 67. De Toni 1895, 262. D. dichotoma Harvey, Alg. Nos. exs. n. 70 in part. — BH. Very low littoral, Dec. 1949. PB. Shaded part of the large littoral pool, south side of Ellen Point, Jan. 1949. The terminal segments of D. apiculata are acute, not obtuse as in D. dichotoma. The VB specimens agree well with specimens of D. apiculata in Melbourne National Herbarium; the BH specimens are very similar but show a slight tendency for the terraparangles to become aggregated into sori.


DICTYOTA SCHIZOPHYLLA (Agardh) Greville. Harvey 1871, pl. 103, f. 2. Papenfuss 1944, 338. — AR. Widely distributed in the upper sublittoral throughout the inlet, all seasons. PB. In sandy pool, main reef, Jan. 1948. Although this is a common alga in American River inlet, no fertile plants have yet been collected. It grows very well, however, with Harvey's figures and specimens from Europe.


These specimens agree well with the figure of Kützing and Harvey, although the fronds are narrower. A few specimens have b-defined sori.

DICTYOTA FRIGIDA Agardh. J. Agardh 1848, 90; 1894a, 80. De Toni 1895, 280. Not D. furcellatum Harvey. — RP. Upper sublittoral, Jan. 1948. This species is regularly dichotomous, in contrast to the more lateral branching of Furcellaria lumbricalis.
(D. furcellata of Harvey). Older parts of the thallus are typically Dictyota in section. Our specimens agree well with some in Melbourne National Herbarium.


An extensive range of specimens, undoubtedly belonging to the same species, has been examined, and they show considerable variation in characters which are accepted as being of generic significance in the Dictyotaceae. The thallus width ranges from 1 to 5 cm., the number of dichotomies from 1 to 4 or 5. The small surface proliferations densely cover well-developed fronds, but the upper parts and older fronds are often largely or almost completely denuded. The transverse section of the thallus in most specimens is that of Dictyota. Old parts of A3299i, however, show two rows of internal cells, though only one in younger parts (c.f. Dictyota). The tetrasporangia and sexual sorii in most specimens are scattered over the thallus but not on the proliferations. Some specimens (e.g., A3299s) show sorangia on both thallus and proliferations, while in others (A3299i and f) they are only on the proliferations (c.f. Glossotherea). Similar variations have been observed in specimens of this species in Melbourne National Herbarium. Kötzting (1839, 6, p. 12, f. 1) described a Dictyota latifolia from the Atlantic which has been relegated to a synonym of D. dichotoma (see De Toni). As J. Agardh's D. latifolia was described in 1894, his name is invalid, and if the species is to be maintained it must be renamed.

J. Agardh 1882, 92, described D. nigricans, which differs from D. latifolia J. Ag. mainly in degree of branching. Specimens of these two species in Melbourne National Herbarium (some were probably named by J. Agardh) are very doubtfully distinct. The degree of branching is variable, and specimens under both names show the variation in cellular structure described above. If the two species are to be combined, D. nigricans has priority and appears to be a valid name. In showing very few dichotomies, the Kangaroo Island specimens are of the D. latifolia form.

Until the type specimens of D. latifolia J. Ag. and D. nigricans J. Ag. can be re-examined, in light of the above remarks, it seems best to leave the position as it is, rather than renaming D. latifolia J. Ag. and adding a name to the literature which may have to be relegated to the synonym of D. nigricans later.


Pachydictyon J. Agardh


Harvey, in describing D. furcellata, recognised that some specimens show characters intermediate between this species and P. paniculatum. The main distinction lies in the wider and more robust frond of P. paniculatum. Most specimens are quite distinct, but some intermediate forms are very difficult to place. Harvey doubted whether his plant was distinct from Dictyota minor Sonder, but from specimens of Sonder's in Melbourne National Herbarium D. minor is probably identical with P. paniculatum.
In his description Harvey referred to, and figured, "spores" which he thought might be ascheridia. A specimen of Harvey's No. 678 in Melbourne National Herbarium shows the ascertations figured by Harvey. They are not reproductive organs but intracellular thickenings. Fig. 1 shows their characteristic form. I have observed similar thickenings in occasional specimens of Dicyota dichotoma and Dilophus fastigatus also.

Fig. 1

Intracellular thickenings in some Dicyotales, as seen by me in the endothelial cells (cortical cells not shown). A. In Harvey's specimen of Parachloris saccata. B. In a specimen of Dicyota dichotoma. C and D. Two typical thickenings.


DILOPHUS J. Aigrad


DILOPHUS FF. J. Aigrad 1894a, 94. De Toni 1895, 290. — BH. Drift, Dec. 1948. M.E. Drift, Jan. 1946. — J. Aigrad placed D. fasciculata in the section Marginata, with two rows of internal cells in the median part and four at the edges. The BH specimens show one row of internal cells and two at the edges in the youngest parts, with the number of rows increasing in older parts to four rows all through, the margin being very slightly if at all thicker. In the presence of small proliferations, general form and position of sort they closely resemble some of Wilson's specimens of D. fasciculata in Melbourne National Herbarium. Wilson's specimens also vary in number of rows of internal cells.
DICTYOPTERIS Lamellose

DICTYOPTERIS MUCROCARPA Womersley 1949, 115, f. 1, pl. 22, f. 2. — W.B. Drift, Jan. 1946. P.B. In pools on the sublittoral fringe and calmer parts of the reefs, all seasons. (Previously reported in Pt. II as D. aspericipida?)


LOROSPIRA Arnould


ZONARIAE

CHLADONIOPHORA J. Agardh


POCOKIELLA Papenfuss


TAONIA J. Agardh

TAONIA AUSTRALICA J. Agardh 1894a, 30. De Toni 1895, 242. Lucas 1936, 87. — BH. Upper sublittoral, Oct. 1947, and drift, Dec. 1948. CC. Drift, Jan. 1948. These specimens agree very well with Agardh's description, and certainly belong to Taonia. In Melbourne National Herbarium there are no specimens of Wilson's under this name, but some labelled Taonia australica which are identical with the Kangaroo Island specimens. These are probably authentic specimens of T. australica, and had been originally referred to by Agardh to T. atomaria. T. australica resembles T. atomaria in form, but is a much smaller plant (4-8 cm. high).

ZONARIA Agardh


I am in full agreement with Papenfuss in not recognizing Homocystidiaceae as distinct from Zonaria. The "twining" of cortical cells in both Z. spiralis and Z. styloides is very variable. Most specimens of Z. spiralis are readily distinguished from Z. subarctica, but intermediate specimens with only slight spiral in the upper parts of the thallus occur, and are difficult to place.


HETEROCERACEAE — CHORDARIALES — MYRIONEMATACEAE

MYRIONEMA Greil.:


CORYNOPHYLACEAE

155

CHORDALIAEACEAE
Cladosiphon Kützing


The thallus is usually simple or sub-simple, with a few branches from a common base. Some M.B. specimens show numerous lateral "proliferations," but all grades to the simple forms occur in the same area.


MYRIOGLOIA Kockeck


POLYCHEREA J. Agardh


These two species of Polykereva are very similar in habit and both grow on Posidonia in similar localities. The figures of Kockeck illustrate well the differences between them. P. nigrescens having large isolated terminal cells on the assimilatory laminae, while P. zostericola has not. J. Agardh's figure (1882, t. II. 38a) of P. australis is incorrect in this respect.

TINOGLADIA Kylin


SHERMATOCHEMACEAE


SPLACHNIDAEACEAE

Sphacelidium Greville

P.B. Upper littoral, south side of Ellen Point, Jan. 1946. P.B. Upper littoral,  
Jan. 1944 (very rare). CW. Upper littoral, Jan. 1946, 1947, 1948 (common,  
on granite rock).

SPOROCYNTHALES — SPOROCYLaE

SPOROCYNTHUS

SPOROCYNTHUS Harveyanus J. Agardh 1895, 32. Sporochlae conosum, Harvey  
161). Examination of a range of specimens may show Sp. harveyanus is not  
distinct from Sp. conosum C. Agardh.

part of large littoral pool, south side of Ellen Point, Jan. 1949.

SPOROCYNTHUS BOREALIS Harvey 1854, 335; 1862, pl. 226. De Toni 1895, 383.  
P.B. Drift, Jan. 1946, 1947. CW. Drift, Jan. 1946. Sporochlae radiiformis and Sp. scoparius may well be forms of one  
species. Sp. scoparius is a more robust plant, usually with a prominent main  
stem; Sp. radiiformis is less robust, usually with several slender stems from  
near the base. Harvey separated these, on robustness, angle of branching  
(wider in Sp. radiiformis) and form of receptacles. The slight differences  
in these features are of doubtful specific distinction, depending on the age  
of the plant, state of development of receptacles, and habitat. Kützing’s  
species Sp. phaeocephalus, Sp. obesus and Sp. cryptos  
cephalus belong to the radiiformis-scoparius complex, and are doubtfully  
distinct species.

ENCYCUTHALIA

ENCYCUTHALIA CLIPTONI Harvey 1859, pl. 62. De Toni 1895, 373. Lucas 1936,  

BELLOTIA

BELLOTIA BISPOROSUM Harvey 1859, pl. 69; 1860b, 298, t. 187, f. 1-3. De Toni  

PERITHEALIA

1936, 100. Carpospora inermis, Harvey 1862, pl. 238. — MB. Drift, Jan.  
Jan. 1946, 1949. P.B. Two to three feet over edge of main reef (and pro-  
bably deeper), all seasons.

NEREA ZOARCINI

NEREA AUSTRALIS Harvey 1859b, 299, pl. 187. Stylophora 1 australia Harvey  
1884, 451; Alg. Aus. exs. n. no. J. Agardh 1848, 86. — P.B. Drift, Jan.  

CARPOBRITA Kützing

CARPOBRITA COSTATA BAER. Newton 1931, 137, f. 84. C. cabrerae Kützing  
**DICTYOSIPHONALES. — PECTINARIAE**

**ASPEROCOCUS Lamouroux**


**COPOMENIA Derbes and Solier**


**HYDROCLATHRUS Bory**


**SCYTOSIPHON Agardh**


**LAMINARIALES — LAMINARIAE**

**MACROCYSTIS Agardh**

*Macrocystis pyrifera* (Lin.) Agardh. De Toni 1895, 372. Setchell and Gardner 1925, 627, pl. 64, 65. Lucas 1936, 95, f. 53. Smith 1944, 94, pl. 3, f. 3-4. — *PB*. Drift, Jan. 1944. Several fragments which may have drifted from some distance away. No beds exist along the coast as far as is known.

**ALGAEAE**

**ECKLONIA Horneana**


*Papenfusii* (1940, 210) considers that *E. bifurcata* (Bory) Pap., *E. exasperata* (Turner) J. Agardh and *E. richardsonii* J. Ag. are specifically distinct from *E. radiata*, being separated on form and presence of marginal and surface spines. Degree of spinness and form are, however, both very variable features, depending on habitat, and in South Australia all the above species must be considered. At Cape Coxsie, in a small inlet (50 metres long
by 5-10 metres wide), relatively sheltered at the inner end and exposed at the outside, gradations in spininess and form are found. Sheltered plants are simple, consisting of a main elongate lamina with small marginal outgrowths, but no spines. In rugged parts a few marginal spines appear, and in the rough conditions at the end of the channel spines densely cover the surface and edges, the plants being dense and stout.

These variations can only be regarded as ecological forms of the one species, and in view of the gradations between them it seems useless to give them even varietal names. Stephenson (1948, 284) has come to a similar belief concerning the South African forms of this species. I suspect that E. hookeriana Sonder is only another form of E. radiata.

**Hormosira bennetti (Turner) Decaisne.** Harvey 1863a, pl. 135. De Toni 1895, 187. Lucas 1936, 29. Cohoon 1948, 47-71. — **AE.** Lower littoral throughout the inlet. **RH.** Lower littoral. **MR and WR.** Low rock pools. **VB.** Lower littoral on reefs in bay. **PB.** Lower littoral on reefs. **RP.** Lower littoral. Present in all season and likely to be found anywhere around the island except in very rough places on steep rock. **H. bennetti** shows a variety of ecological forms. On the whole each form is characteristic of a particular habitat, but gradations between them occur in intermediate habitats. The following forms occur around Kangaroo Island.

3. *H. radiata* (in Kittting 1800, t. 4, f. 2). Rocky Point and Ballast Head.

**NOTE** Bailey and Harvey

**Notheaa anomala** Bailey and Harvey. Harvey 1862, pl. 213. De Toni 1895, 224. Lucas 1936, 82, t. 48. — **VB.** On Hormosira bennetti on reefs in bay. **PB.** On H. bennetti on reefs. All seasons. **Notheaa** is usually parasitic on Hormosira bennetti, but has only been found on E. hookeriana on reefs on the south coast, where wave action is strong.

**Myriodesma** Decaisne


**Myriodesma latifolia** Harvey var. duriscula. J. Agardh, Harvey 1888, pl. 24 ('var species'). J. Agardh 1894, 92. De Toni 1895, 192. — **CC.** Drift, Jan 1948. **PB.** In shaded parts of large rock pools, south side of Ellen Point, Jan. 1945, 1949.

having an entire (not spinous) margin. The Kangaroo Island specimens are mostly entire, sometimes with one or two small marginal spines. Most of the specimens in Melbourne National Herbarium under M. quercifolium and M. calyphyllum are entire, some with a few marginal spines. Without examining the type material, together with a range of specimens, it is difficult to judge whether these two species are distinct or not, but I suspect they are not. M. quercifolium has been recorded generally in the Southern Australian region, and the type locality is somewhere in this region. Should M. calyphyllum prove to be distinct from M. quercifolium, the Kangaroo Island specimens will probably belong to the former.

SCYTOSPHAELA Greville


SEIROCCUSUS Greville


XIPHIOPHORA Montague


This species was at first confused with CystosPHAERA australis (see correction in Pt. 11). It grows to 8 or 12 cm. high, and has rarely been found fertile. Kangaroo Island is probably the extreme west of the geographic range of var. minus.

CYSTOSPHAERA Kützing


CYSTOSPHAERA J. Agardh

Some authors have used the generic name BL姐姐IA Decaisne. Cystosphaera J. Agardh appears in the "Nomina Generica conservanda proposita" of the 1935 edition of the International Rules, and it is to be hoped this well-known name will be adopted at the next Botanical Congress.


Point, all seasons. **P.B.** In littoral pools on a reef, Jan. 1947, and drift, June 1947.


**Cystophora** **dumosa** (Greville) J. Agardh 1870, 444. De Toni 1895, 162. *Biservellina dumosa*, Kützing 1860, t. 73, f. 1. **— PB. Drift, May 1945, Jan. 1946. PB. Drift, all seasons.**


**Cystophora** **nudissima** J. Agardh 1897, 102. **— In the sublittoral fringe throughout the Exposed Rocky Coast Subformation, all seasons (see Pt. 1).**

**Cystophora** **monilifera** J. Agardh 1844, 241. Harvey 1863, pl. 245. De Toni 1895, 146. Lucas 1936, 73. **— BB, ME, WR, WB, CC, PB, PB, CW, AR,** at drift from sublittoral, all seasons. Widely distributed in the sublittoral around the island. Rarely on rock in the channel at AR inlet.

**Cystophora** **punctulata** (Turkev.) J. Agardh. Harvey 1863, pl. 247. De Toni 1895, 149. Lucas 1936, 74. **— WR, ME, and CC. Drift, PB. Drift and in the large littoral pool, south side of Ellen Point. PB. In the Cystophora-ceratina and sublittoral fringe associations on reefs and sublittoral. **CW.** Drift. All seasons in all localities.**


**Cystophora** **pseudoclera** Areschoug in J. Agardh 1848, 240. De Toni 1895, 148. Lucas 1936, 74. Widely distributed in the upper sublittoral within the Sheltered Rocky Coast Subformation, all seasons. Also in very sheltered pools at PB and CW, all seasons.


**Cystophora** **religiosa** J. Agardh 1870, 445. De Toni 1895, 143. Lucas 1936, 72. **— In the upper sublittoral and in low, large littoral pools throughout the Rocky Short Subformation. Common on reefs on the south coast. All seasons.**
CYTOPHYLLUM J. Agardh.


SARGASSUM

SARGASSUM REFORME Sonder. J. Agardh 1889, 75, pl. 23, f. 3. De Toni 1895, 34. Lucas 1936, 67. — AR. Sublittoral and upper sublittoral on rock along channel, occasional, all seasons. Also cast up (from Eastern Cove), May 1946, Sept 1946.


RHODOPHYTA

BANGIOIDEA — SANCICLLES — BANGIACEAE

BANGIA Lyngbye


POLYPHYRA C. Agardh


FLORIDEAE — NEMALONIALES — ACROGONIACEAE

ACROGONIUM WAGGILL


BONNOMASIDACEAE

ASPARGOPSIS Majumdar


Feldmann has presented evidence based on culture experiments and morphology, that Faskaenbogia (Rhodocodium) is the taxonomic phase of Asparagopsis armata. Faskaenbogia has not yet been found around Kangaroo Island.
Asparagus taxiflorus (Dale) Coates and Harvey. Feldmann 1942, 82. Asparagus taxiflorus var. seminervus Harvey 1838, pl. 6. De Toni 1900, 771. — Narrow coast (so details). This single specimen in the Adelaide University Herbarium agrees with others from Port Willunga, in Gulf St Vincent which are referable to A. seminervus Harvey. Feldmann and others consider this species identical with A. taxiflorus, any differences being due to the habitat.

**Baccharis halimifolia C. A. Meyers**


**Delisea Lamouroux**


**Helminthocladaceae**

**Lagora Lamouroux**


Lagora wilsoniana Zeih 1913, 269. De Toni 1923, 94. Lucas and Perrin 1947, 134. — PB. Littoral, ex sleeping pool, Jan., 1948. No authentic specimens are available for comparison, but the specimens agree very well with Zeih's description.

**Nemalion Tapponi-Tronetti**

Nemalion helminthocladus (Vallely) Batters. Coote 1912, 133. Newton 1931, 256. Lucas and Perrin 1947, 141, 1. 7. N. helminthocladus. Smith 1944, 186, pl. 41, f. 5. — AB. Mid littoral on a rock on Strathbridge Point, Jan., 1949. PB. Mid and lower littoral, Jan., Dec., 1948. MW. Mid littoral. Jan., 1946, 1947, 1948. PB. Sublittoral fringe, main reef, near, Jan., 1947. In form this species ranges from plants with a few simple branches from a common base to ones dichotomously or even profusely branched many times. (See fig. 2). These latter dichotomous forms are included by most authors under N. multipliiatus (Weber and Coates) J. Agardh, but such a great variation in the degree of branching is found, even in the same situation, that only one species can be maintained around Kangaroo Island. Some of the forms found in one colony at Bula Boor are shown in fig. 2. The Middle River specimens are usually rather simple, those at Pennington Bay with numerous branches. Coote also found difficulty in separating N. helminthocladus and N. multi-
N. helminthoides; has priority as a specific name over N. multifidum if they are to be united.

May 1945, 122, recorded N. multifidum from New South Wales, noting that there were few branches in her specimens. I have seen plants of Nemalion at Harbord, N.S.W., which show very simple thalli, which are best referred to N. helminthoides.

Fig 2

The range of form in Nemalion helminthoides on Kangaroo Island. A. A typical specimen from the coast at Midjig River. B, C, D, F. Specimens from Ballast Head. The form shown in A also occurs here. E. A specimen from Pennington Bay. Approx. 4 natural size.