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ROYAL BOTANIC GARDENS, KEW.

BULLETIN
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No. 2.]

[1907.

VIII.—MARINE ALGAE FROM THE CHATHAM ISLANDS.

A. D. COTTON.

The distribution of marine algae is a subject which has of late received some attention from botanists, but owing to insufficient data our knowledge is, up to the present, rather imperfect. The record of accurate determinations from any little known region may therefore be of value as providing a basis for further study.

Amongst the algae recently received at the Herbarium is an interesting collection from the Chatham Islands forwarded by Miss H. E. Maltby. These islands appear to possess a luxuriant marine vegetation. Miss Maltby notes the profusion of weeds on the shore; and Mr. R. M. Laing, who for many years has worked at the New Zealand marine flora, observes in a letter: "There are many novelties to be obtained here; in fact I have seen a good many undescribed species from the locality, which seems to be rich in marine algae."

The literature of the Chatham Islands algae is scanty. Agardh published two short lists, and Reinhold includes the Islands in his "*Ergebnisse einer Reise nach dem Pacific. Meeresalgen.*" Laing also has obtained some records.

When the general character of the specimens received is considered, their marked difference from those of the Northern hemisphere is at once apparent. As in the case of Phanerogams, when one looks over any of the lists of algae from the Southern hemisphere one cannot fail to be struck with the fact that if we exclude a few cosmopolitan forms none of the species given occur in Europe or N. America. New Zealand appears more strikingly diverse in this respect even than Australia; and it is to the flora of this country that the Chatham Islands algal flora bears most resemblance.

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Subjoined is a list of those algae in Miss Maltby's collection which it has been possible satisfactorily to determine :—

CHLOROPHYCEAE.

Enteromorpha acanthophora, Kütz., Spec. Alg., p. 479 ; De Toni Syll. Alg. vol. i., p. 135.

Lyall's Otago specimens determined by Harvey as *E. clathrata* var. *ramulosa*, Harv., have been frequently quoted as *E. acanthophora*, Kütz. This is not correct. An examination of Lyall's specimens in the Kew Herbarium shows that the plant is in reality what it was originally named, or as it is known to-day *E. ramulosa*, Hook.

DISTRIBUTION. New Zealand.

Caulerpa Brownii, Endl., Gen. Pl. Suppl. vol. iii., p. 16 ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 260. *C. furcifolia*, Harv. in Hook. l. c. p. 260. Concerning this species Weber van Bosse (Mon. p. 307) remarks :—"J'ai été frappée de voir que, parmi les échantillons de la Nouvelle Zélande, il y en avait tant, chez lesquels le nombre de ramules avait diminué. J'ai observé également un amoindrissement du nombre de ramules chez des échantillons du *C. hypnoides* venant de la même localité, et je me suis demandée si ceci pouvait être à cause des courants d'eau froide qui, venant du Pôle, se mêlent à l'Océan Pacifique et en abaissent la température."

The Chatham Islands specimens do not show the above-mentioned peculiarity. The depth below the surface of the water is also a factor of importance in the solution of such problems, and the recent work of Svedelius (Ecol. and Syst. Studies of the Ceylon Species of *Caulerpa*, Ceylon Marine Biological Reports No 4, 1906) tends to show that in the case of *C. clavifera* diminished light causes distinct elongation of the axis.

DISTRIBUTION. S. Australia, Tasmania, New Zealand.

PHAEOPHYCEAE.

Carpophyllum Phyllanthus, Hook. et Harv. in Lond. Journ. Bot. vol. iv., p. 525 ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 212 ; Laing Revised List, in Trans. New Zeal. Inst. vol. xxxii., 1899, p. 68, with figures.

DISTRIBUTION. New Zealand.

Carpophyllum plumosum, J. Ag., De Alg. Nov. Zel. p. 11. *Sargassum plumosum*, A. Rich. ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 212 ; Laing Revised List, in Trans. New Zeal. Inst., vol. xxxii., 1899, p. 68, with figures.

DISTRIBUTION. New Zealand.

Cystophora retroflexa, J. Ag., Sp. Alg. vol. i., p. 242 ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 214.

DISTRIBUTION. Australia, Tasmania, New Zealand.

Hormosira Banksii, Decne. in Ann. Sci. Nat. sér. ii. vol. xvii., p. 331 ; De Toni Syll. Alg. vol. iii., p. 187.

DISTRIBUTION. Australia, Tasmania, New Zealand.

Xiphophora chondrophylla, *De Toni*, Syll. Alg., vol. iii., p. 213 ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 215.

DISTRIBUTION. Australia, New Zealand.

Zonaria Turneri, *J. Ag.*, Chat. öar. alg., p. 438. *Z. interrupta*, Harv. Phyc. Austral. tab. 190.

DISTRIBUTION. Australia, Tasmania, New Zealand.

Scytothamnus australis, *Hook. et Harv.* in Lond. Journ. Bot. vol. iv., p. 531 ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 219.

DISTRIBUTION. New Zealand, Cape Horn, S. Australia ?

Stypocaulon funiculare, *Kütz.*, Sp. p. 467 ; Reinke *Vergl. Anat. Morph. Sphacelar.* p. 22, t. 8. *Sphacelaria funicularis*, *Mont.* ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 221.

S. paniculatum, *Kütz.*, was frequently confused by older writers with the present species. Reinke, l. c., has fully gone into the question and has pointed out the inaccuracies in previous descriptions. *S. paniculatum* may be distinguished from *S. funiculare* by the characteristic fertile frond with sori consisting of a multicellular placenta, and numerous sessile unilocular sporangia.

DISTRIBUTION. Australia, New Zealand, Cape Horn.

FLORIDEAE.

Gigartina angulata, *J. Ag.*, *Epicr.* p. 197. *G. stirriata*, *Ag.* ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 252, non aliorum. *Iridaea stirriata*, *Hook. et Harv.* in Lond. Journ. Bot. vol. iv., p. 547.

G. stirriata, *Ag.* in Harvey Gibson's New Zealand List has been pointed out by Laing to be *G. angulata*. Thus the former plant is still only known from the Cape ; it is distinct from *G. angulata* as explained by J. Agardh, *Epicr.* p. 197.

DISTRIBUTION. New Zealand.

Stenogramme interrupta, *Mont.* in Duchartre *Rev. Bot.* 1846, p. 483 ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 249.

This interesting alga, though not general in its distribution, has been reported from various quarters of the world. It is locally abundant, but sporadic, and appears to be most frequent in certain localities of New Zealand. It is, however, also known from Australia, Florida, California and Japan. In Europe it is very rare, but has been collected on the coast of Devon, in the North of France, and in Spain.

The Chatham Islands specimens, of which both cystocarpic and tetrasporic plants were received, are somewhat more robust than those of Europe.

DISTRIBUTION. Vide supra.

Callophyllis Hombroniana, *Kütz.* ; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 251.

DISTRIBUTION. New Zealand.

Callocolax neglectus, Schmitz ex Batters in Ann. Bot. vol. ix., 1895, p. 316.

On *Callophyllis Hombroniana*, Kütz.

New Zealand specimens were recorded by Laing (Trans. New Zeal. Inst. vol. xxxvii., 1904, p. 282.)

DISTRIBUTION. On *C. laciniata*, Kütz. British Isles.

On *C. Hombroniana*, Kütz. New Zealand.

Rhodophyllis chathamensis, Cotton, sp. nov.

A *R. membranacea*, Harv. tetrasporangiis in sorum collectis distincta.

Species submembranacea, mediocris magnitudinis, flabellatim vel irregulariter ramosa; frons duobus distinctis cellularum stratis contexta, cellulis interioribus majoribus per duas series frondis plano parallelas dispositis, cellulis corticalibus minutis aspectu rosulato-areolato a superficie desunt; rami 5 mm. lati, subdichotomi vel flabellati, margine integro, segmentis terminalibus angustioribus obtusis; venae nullae; cystocarpia incognita; tetrasporangia secus mediam paginam incrassatam fere in soro disposita, $40 \times 20 \mu$. Color brunneo-ruber.

In form this species often resembles *R. membranacea*, Harv. It differs from it however both in the structure of the frond and the position of the tetraspores. The cortex is distinct, and is composed of a uniform layer of minute cells, which entirely covers the inner tissue. A true rosulato-areolate arrangement is not present, though the outline of the larger cells beneath is very obvious. *R. membranacea*, Harv., differs in the punctate thallus, and incomplete cortex. In the arrangement of the tetraspores the present species approaches the Australian *R. Brookeana*, J. Ag., to which it is perhaps most nearly allied; it differs from it in the structure of the frond.

Rhodophyllis membranacea, Harv. in Hook. Fl. Nov. Zel., vol. ii. p. 247, t. 117. *Halymenia membranacea*, Hook. et Harv. in Lond. Journ. Bot. vol. iii., 1844, p. 448; non *R. membranacea* Harv., Alg. Austral. exsicc. No. 372, 373.

Originally described by Harvey from Tasmania in 1844, and 11 years later figured by him in Fl. New Zeal. Recently this alga has been almost completely lost sight of. For the present it will suffice to say that an examination of the original specimen in Herb. Kew shows the references quoted above to be correct. It is hoped to publish a full account of the New Zealand species of *Rhodophyllis* shortly.

DISTRIBUTION. S. Australia, Tasmania, New Zealand.

Sarcodia Montagneana, J. Ag., Spec. vol. ii., p. 623; Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 242. *Rhodymenia Montagneana*, Harv. Ner. Austral. tab. 48.

DISTRIBUTION. New Zealand.

Apophlaea Lyallii, Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 244, tab. 116 a.

DISTRIBUTION. New Zealand.

Champia Novae-Zelandiae, *Harv.* in Hook. Fl. Nov. Zel., vol. ii., p. 235; cf. Laing. in Trans. New Zeal. Inst. vol. xxxiv., 1901, p. 338.

DISTRIBUTION. New Zealand.

Chylocladia umbellata, *Harv.* in Hook. Fl. Nov. Zel., vol. ii., p. 253, tab. 119 c.; De Toni Syll. Alg. vol. iv., p. 577.

DISTRIBUTION. New Zealand.

Plocamium abnorme, *Hook. et Harv.* in Lond. Journ. Bot. vol. iv., p. 543; *Harv.* in Hook. Fl. Nov. Zel., vol. ii., p. 246.

DISTRIBUTION. New Zealand.

Plocamium brachiocarpum, *Kütz.*, Sp. p. 885; De Toni Syll. Alg. vol. iv., p. 592.

DISTRIBUTION. New Zealand.

Nitophyllum palmatum, *Harv.* in Hook. Fl. Nov. Zel., vol. ii., p. 240, (var. excl.); De Toni Syll. Alg. vol. iv., p. 659.

DISTRIBUTION. New Zealand.

Laurencia obtusa, *Lam.*, Ess., p. 42; De Toni Syll. Alg. vol. iv., p. 791. The specimens though differing slightly from those of Europe are not sufficiently dissimilar to justify their being regarded as a distinct species.

DISTRIBUTION. In almost all tropical and temperate seas.

Laurencia botryoides, *Gaill.*, Résumé p. 15; *Harv.* Phyc. Austral. tab. 182.

L. thyrsoifera, *J. Ag.*, which approaches this species very closely, differs in having opposite branches. Transitional forms are not wanting, and it is doubtful if the two plants are distinct.

DISTRIBUTION. S. Australia.

Laurencia heteroclada, *Harv.* in Trans. Irish Acad. vol. xxii. p. 544; Phyc. Austral. tab. 148.

DISTRIBUTION. S. and W. Australia, New Zealand.

Laurencia gracilis, *Harv.*, Ner. Austral. p. 84. *L. filiformis*, *Hook. et Harv.* in Lond. Journ. Bot. vol. vii., p. 444, (non alibi).

DISTRIBUTION. New Zealand.

Cladhymenia oblongifolia, *Hook. et Harv.* in Lond. Journ. Bot. vol. iv., p. 540; *Harv.* in Hook. Fl. Nov. Zel., vol. ii., p. 235, tab. 113

DISTRIBUTION. New Zealand.

Polysiphonia Lyallii, *Hook. et Harv.* in Hook. Fl. Antarct. vol. i., p. 182, tab. 74; *Harv.* Ner. Austral. p. 41.

DISTRIBUTION. New Zealand.

Polysiphonia aterrima, *Hook. et Harv.* in Lond. Journ. Bot. vol. iv., p. 536; *Harv.* Ner. Austral. p. 52, non *J. Ag.*

DISTRIBUTION. New Zealand.

Euzoniella ovalifolia, *Falkenb.*, Die Rhodomelaceen p. 367.
Polyzonia ovalifolia, Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 226,
 tab. 112 b.

On *Cheilosporium Wardii*, De Toni.

DISTRIBUTION. New Zealand.

Metamorphe Colensoi, *Falkenb.* in Engl. & Prantl Nat. Pflanzenf.
 p. 445. *Polysiphonia Colensoi*, Harv. in Hook. Fl. Nov. Zel.,
 vol. ii., tab. 112 c. (parum characteristic).

On *Cystophora retroflexa*, Ag.

DISTRIBUTION. New Zealand.

Dipterosiphonia dendritica, *Falkenb.*, Die Rhodomelaceen p. 324.
Polysiphonia dendritica, C. Ag., non Hook. et Harv.

On *Cheilosporium Wardii*, De Toni.

DISTRIBUTION. Australia, New Zealand, Brazil.

Lenormandia Chauvinii, Harv. in J. Ag. Spec. vol. iv., p. 1104;
 Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 222 (excl. var. *angustifolia*).

DISTRIBUTION. Australia, New Zealand.

Bostrychia mixta, Hook. et Harv. in Lond. Journ. Bot. vol. iv.
 p. 270 et p. 539; Harv. Ner. Austral. p. 70; Phyc. Austral.
 tab. 176 a. Hook. Fl. Nov. Zel., vol. ii., p. 225.

DISTRIBUTION. Australia, New Zealand, S. Africa.

Griffithsia Sonderiana, J. Ag., Epicr. p. 62; Laing, in Trans.
 New Zeal. Inst. vol. xxxvii., 1904, p. 389. *Callithamnion*
Griffithsiae, Harv. Alg. Austral. Exsicc. No. 535. *Griffithsia*
setacea, Harv. quoad spec. ex Austral. et Nov. Zel. *Monospora?*
griffithsioides, De Toni Syll. Alg. vol. iv., p. 1302.

DISTRIBUTION. S. Australia, Tasmania, New Zealand.

Ceramium apiculatum, J. Ag., De Alg. Nov. Zel. p. 14. *C. cancel-*
latum, Harv. in Hook. Fl. Nov. Zel., vol. ii., p. 256 (non alibi).

DISTRIBUTION. New Zealand.

Lithothamnion cystocarpideum, Fosl., Alg. Notiser, vol. ii. p. 7.
 (Kgl. Nor. Vid. Selsk. Skr. 1906 No. 2.) sp. nov.

As the original description of this species is published in the
 Norwegian language a Latin translation is given below.

L. conchato, Setch. et Fosl. affine a quo conceptaculis sporangiorum
 recedit.

Frons suborbiculata, paulum convexa aut concava, 0.4–1 cm.
 diam., 0.2–0.5 mm. crassa, plusminusve undulata, saepe irregu-
 lariter incisa. *Conceptacula sporangiorum* convexa aut
 hemispherica, 300–500 μ diam., centro valde depressa, tegmine
 canalibus 12–20 intersecto, *sporangia* zonatim 4 divisa, 160–240
 $\times$ 50–80 μ ; *conceptacula cystocarpiorum* subconica, 300–600 μ diam.

HAB. in frondibus Cheilosporii.

This species was sent to Mr. Foslie the well-known authority on
Lithothamnium. He has described it as new, and has furnished the
 following notes.

"In habit and also partly in structure this species is most nearly related to *L. conchatum*, Setch. and Fosl. from the Pacific coast of North America. The conceptacles of sporangia however approach those of *L. haptericolum*, from New Zealand, and *L. nitidum*, Fosl. from Japan. If only a cursory examination be made, the conceptacles of sporangia may easily be confounded with those of the cystocarps."

Lithothamnion Patena, Heydr., Lith. Mus. Paris, 1901, p. 542.
Melobesia Patena, Harv. Ner. Austral. p. 111, tab. 40.

Foslie though previously regarding this plant as a form of *L. lichenoides*, Heydr. states in a letter that he now considers it "a separate species as remarked in 'Antarctic and Sub-Antarctic Corallinae' now in the press."

DISTRIBUTION. New Zealand.

Cheilosporium Wardii, De Toni, Syll. Alg. vol. iv., p. 1828.
Amphiroa Wardii, Harv., Ner. Austral. p. 99, tab. 38.

DISTRIBUTION. Australia.

Corallina armata, Harv., Ner. Austral. p. 103, tab. 40, fig. 1-7.

DISTRIBUTION. New Zealand.

Corallina Cuvieri, Lamour., Pol. flex. p. 286; Harv. Ner. Austral. p. 106. *Jania granifera*, Decne. *J. subulata*, Sow.

DISTRIBUTION. S. Australia, New Zealand.

IX.—THE WESTERN CATALPA.

(*Catalpa cordifolia*, Jaume [*C. speciosa*, Warder.])

W. J. BEAN.

A number of enquiries have recently been addressed to Kew as to the likelihood of this tree proving of value in the British Isles for the production of timber. Some of these enquiries probably had their origin in statements that have appeared in the daily press describing the wonderfully durable qualities of the timber of this tree. But one correspondent says: "I was told by the chief engineer of 3,000 miles of railroad in the Southern States of U.S.A. that the railway companies were now planting large areas to supply them with sleepers, and that he had known this timber to stand 30 years in situations where 'White Oak' rotted in 6 or 7 years."

The wood of *Catalpa cordifolia* undoubtedly possesses a remarkable quality of resisting decay in moist places or in contact with the soil. Numerous instances of this are recorded by American authorities. In Sargent's *Silva of North America*, vol. vi., p. 90, the following statement occurs: "The trunks of the *Catalpa* trees killed by the sinking and subsequent submersion of a large tract of land near New Madrid, Missouri, which followed the earthquake of August, 1811, were standing and perfectly sound