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SOME MIDWINTER ALGAE OF LONG ISLAND SOUND

BY MARSHALL A. HOWE

For reasons that are more or less obvious the marine algae of the coasts of New York and New England have received little attention from collectors during the coldest months of the year. Mr. F. S. Collins once published in *Rhodora** a brief paper on "Seaweeds in Winter", with a specific allusion to his experiences "at a point on the shore of Long Island Sound" on an intensely cold first day of January. Professor Bradley Moore Davis has more recently in his important contributions to the "Biological Survey of the Waters of Woods Hole and Vicinity" (p. 474) given a list of fifty-four species of algae "known to be present in the cold-water sublittoral formation of the winter and spring" and he remarks that the water temperatures for this formation probably average under 35° F. for at least two and a half months. Exact dates are not given, but it seems to be implied that any one of the fifty-four may be found during the coldest weeks of the year. A chart illustrating the algal flora of Spindle Rocks at Woods Hole on December 30, 1904, includes eighteen species and another for March 17, 1905, shows ten species. In the detailed list of the species of the Woods Hole region there are remarks on the seasonal distribution of each, such as "summer," "summer, undoubtedly at other seasons," "summer, undoubtedly throughout the year," "at all seasons," etc. In a recent interesting paper† on "The Seasonal Life-Cycle of some Red Algae at Woods Hole" Professor I. F. Lewis outlines the life-history of several

* 2: 130-132. 1900.

† *Plant World* 17: 31-35. 1914.

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common red seaweeds of that region, but makes no specific references to midwinter observations.

The present notes have been suggested by several small collections of marine algae made at and near Orient, New York, by Mr. Roy Latham during the month of February of the present year, a February, by the way, that ranks among the coldest ever recorded by the New York City station of the United States Weather Bureau. Most of the specimens were found washed ashore after heavy storms and may have been passing the winter in the deeper waters, but there seems to be nothing in the list to excite suspicions as to the actual local occurrence of the species found.

The four following species were found "near the shore of Gardiner's Bay" on February 7:

Scytosiphon lomentarius (Lyngb.) J. Ag. Plants 14-20 cm. long with well-developed gametangia.

Cystoclonium purpurascens (Huds.) Kütz. Plant (or fragment) about 10 cm. high and incipiently tetrasporic. *Cystoclonium* is annotated by Davis as a summer plant at Woods Hole.

Agardhiella tenera (Ag.) J. Ag. A battered and weather-worn fragment with immature or somewhat abnormally developed tetrasporangia. Occurring with undoubted *Cystoclonium purpurascens*, the specimen might possibly be suspected of representing a coarse denuded condition of that species, but the mode of branching and the larger cells of the inner cortex as well as the stouter habit indicate that it belongs with *Agardhiella tenera*. Lewis considers this a summer species at Woods Hole, but Davis remarks of it, "summer, undoubtedly at other seasons."

Ceramium rubrum (Huds.) Ag. Apparently sterile.

The species of the list immediately following were found on the shores of the Sound on February 14, just after a severe storm:

Ulva Lactuca L.

Desmarestia aculeata (L.) Lamour. The denuded autumn and winter condition.

Laminaria Agardhii Kjellm.

Laminaria digitata (L.) Lamour.

Chondrus crispus (L.) Stackh. Tetrasporic.

Gymnogongrus Torreyi (Ag.) J. Ag. This is probably only a peculiar flattened condition of *Ahnfeltia plicata*, as has been pointed out by Professor Setchell.* The flattening, however, as in Agardh's type specimens, is often pronounced in the upper parts of the plant, the longer transverse axis being sometimes twice as long as the shorter.

Ahnfeltia plicata (Huds.) Fr.

Sterrocolax decipiens Schmitz. Abundant on "*Gymnogongrus Torreyi*," which fact may be interpreted as strengthening the idea that *G. Torreyi* is only a form of *Ahnfeltia plicata*.

Cystoclonium purpurascens (Huds.) Kütz. Apparently sterile.

Rhodymenia palmata (L.) Grev. Large tetrasporic specimens attached to *Laminaria* stalks.

Polysiphonia elongata (Huds.) Harv. Apparently sterile. The specimens are in part fibrillose and in part represent the coarse denuded autumn and winter condition. Davis ascribes the species to "summer," but Farlow† recognizes its perennial habit.

Spermothamnium Turneri (Mert.) Aresch. Attached to the base of *Polysiphonia elongata*.

Callithamnion Baileyi Harv. With mature cystocarps.

The following were collected on February 25. Mr. Latham writes that the *Chaetomorpha*, the *Sargassum*, and the *Champia* were taken by cutting a hole "through fifteen inches of ice on the bay":

Chaetomorpha Linum (Müll.) Kütz.‡

Sphacelaria cirrhosa (Roth) Ag. Attached to *Ascophyllum* (?) and forming tufts 0.5–1.5 cm. high. Davis refers this to the summer species.

Desmarestia aculeata (L.) Lamour.

Sargassum Filipendula (Ag.) J. Ag. A plant nearly 5 dm. high,

* Rhodora 7: 136–138. 1905.

† Mar. Alg. N. E. 172. 1881.

‡ *Ch. Linum* has been referred to *Ch. aerea* (Dillw.) Kütz. as a form by F. S. Collins (Green Alg. N. Am. 325. 1909). The plant described by Dillwyn may be the *natural* type of the species, but that described by Müller more than thirty years earlier would appear to be the *historical* type, and, if one is to be considered a form of the other, the rules of botanical nomenclature as now almost universally interpreted and applied would seem to demand that Mr. Collins' procedure should be reversed and that *Ch. aerea* should be regarded a form of *Ch. Linum*.

somewhat darkened and with scarcely developed receptacles, but otherwise of about the normal habit.

Phyllophora membranifolia (Good. & Woodw.) J. Ag. Tetrasporic.

Champia parvula (Ag.) Harv. Plants 3-4 cm. high, apparently sterile. This species is ascribed to summer by Davis.

Delesseria sinuosa (Good. & Woodw.) Lamour. A battered tetrasporic plant.

Polysiphonia elongata (Huds.) Harv. Plants 10-15 cm. long, fibrillose, apparently sterile.

Melobesia Lejolisii Rosan. On leaves of *Zostera*.

Dermatolithon pustulatum (Lamour.) Fosl. On leaves of *Zostera*, with the preceding.

Mr. Latham sent in for determination several collections also that were made in the month of March and so are perhaps not properly to be referred to as "midwinter" algae, but two of these collections were so little later than the month of February that they are of some interest in this connection. The first of these March specimens were picked up on the "Sound shore" on March 5, but are believed to have washed in "with the great storm of March 1." Omitting the common Fucaceae and a few others already mentioned, those of March 5 were

Halothrix lumbricalis (Kütz.) Reinke. On *Zostera* leaf, fertile.

Punctaria latifolia Grev. Sterile.

Desmarestia viridis (Müll.) Lamour.

Chondrus crispus (L.) Stackh. Tetrasporic and cystocarpic.

Phyllophora membranifolia (Good. & Woodw.) J. Ag. Tetrasporic and cystocarpic plants. The "nemathecia" of this species are in structure very suggestive of *Actinococcus subcutaneus* (Lyngb.) Rosenv., parasitic on *Phyllophora Brodiaei*. In form, however, they are strikingly different from the sub-spherical thalli of *Actinococcus subcutaneus* and a microscopical examination seems to indicate that they are integral parts of the *Phyllophora* thallus rather than parasitic organisms. The recently established facts as to alternation of generations in the Florideae, together with the obvious structural resemblances just alluded to, suggest a further consideration of Reinke's idea*

* In Darbishire, On *Actinococcus* and *Phyllophora*. Ann. Bot. 13: 264. 1899.

that *Actinococcus subcutaneus* may really be "an asexual generation of *Phyllophora Brodiaei*, growing parasitically on the sexual generation." Darbishire (*loc. cit.*) succeeded in showing that the thallus of *Actinococcus subcutaneus* develops from a spore that enters the thallus of the male plant of *Phyllophora Brodiaei* through an antheridial ostiole, but he was not able to discover whence the spore came or whether it was a tetraspore or a carpospore.

Polysiphonia urceolata formosa (Suhr) J. Ag. Sterile.

Rhodomela subfusca (Woodw.) Ag. Tetrasporic.

Ceramium rubrum (Huds.) Ag. Tetrasporic.

Rhododermis Georgii (Batt.) Collins. Forming cushions on the margins of *Zostera* leaves, with sporangia.

Corallina officinalis L.

On March 7, *Pylaiella littoralis* (L.) Kjellm., *Polysiphonia nigrescens* (Dillw.) Grev., and *Epilithon membranaceum* (Esp.) Heyd. were added to the foregoing lists.

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OCCURRENCE OF THE INDIAN PIPE (*MONOTROPA* *UNIFLORA*) IN A XEROPHYTIC HABITAT

BY EDWIN D. HULL

The Indian pipe (*Monotropa uniflora*) is considered one of the most mesophytic of our plants, and the habitat in which it grows is supposed to conform to its nature. The 7th edition of Gray's Manual gives the habitat of this species as, "Rich and dark woods." S. Coulter (1) says, "Indicative of rich soil." I have, however, found it growing sparingly on the oak dunes about Lake Michigan at Miller, Lake Co., Indiana, where it seems to be the only mesophyte in an otherwise distinctly xerophytic flora, at least so far as the vascular plants are concerned. The trees of this association, of which the black oak (*Quercus velutina*) far exceeds all the other species in abundance, stand some distance apart and permit considerable light to penetrate, so that the forest is decidedly open rather than dark. The undergrowth does not form a continuous mat, and there are numerous broad



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