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MARINE ALGAE EPIPHYTIC ON LAMINARIALES PLANTS

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Contents

| | |
|-------------------------|-----|
| Introduction | 73 |
| List of Epiphytes | 78 |
| Cyanophyceae | 78 |
| Chlorophyceae | 79 |
| Phaeophyceae | 81 |
| Rhodophyceae | 91 |
| Summary | 102 |
| Literature | 102 |

Introduction

Since the time of Tobler's classical work entitled "Epiphyten der Laminarien," published in 1909, many phycologists have accumulated numerous data about the epiphytic marine algae growing on or in the thallus of Laminariales plants. However, no one has ever published to date a list of those epiphytes, so far as the writer is aware. The list here presented has been prepared by consulting 63 publications of previous investigators and by adding certain new data obtained during a research on the organisms growing on the Laminariales plants that was carried out by the writer in collaboration with one of his students (Tokida & Yama, 1960).

Epiphytism of seaweeds is in certain cases a fixed character of a species but in others merely an occasional phenomenon occurring in a species only by chance. Many seaweeds which usually grow on rocks can also attach epiphytically to other seaweeds if conditions are favourable. So it may seem meaningless to enumerate the epiphytes of Laminariales plants. As a matter of fact, however, there is always a definite tendency in the quality and quantity of epiphytic seaweeds growing on a certain species of Laminariales at a given locality and in a given season. Far-distance migration of a seaweed may be a matter of possibility if the seaweed grows epiphytically on a detached and drifting thallus of a kelp such as *Nereocystis luetkeana*. Epiphytic organisms growing more or less markedly on some economically important kelps may draw the attention of fishermen. A list of epiphytic marine algae such as the present one will be of some use in providing certain items of information for a study of these and related problems.

The present list comprises 126 genera and 285 species of seaweeds that have been reported to be epiphytic on the Laminariales plants belonging to 22 genera. These epiphytes

include 2 genera and 3 species of Cyanophyceae, 16 genera and 22 species of Chlorophyceae, 37 genera and 116 species of Phaeophyceae, and 71 genera and 144 species of Rhodophyceae. They are all attaching directly to, or growing in the tissue of, the surface of the host frond except only two endozoic species, viz., *Endodictyon infestans* GRAN (No. 47) and *Acrochaetium infestans* HOWE et HOYT (No. 154). The former grows in the body of a Bryozoa, *Membranipora* sp., attached to the old blade of *Laminaria*, and the latter in stolons and hydrocaules of a Hydrozoa, *Obelia geniculata*, attached to the frond of *Laminaria*.

Certain relations between the hosts and the epiphytes are summarized in Tables I and II. Among the 22 genera of Laminariales, *Laminaria* stands first in the number of epiphytic algal genera which count 106 in total. Next comes *Alaria* whose epiphytes are 27 in number of genera. Then follows *Chorda* with 21 epiphytic genera. The giant kelps, *Macrocystis* and *Nereocystis*, show comparatively few epiphytes contrary to one's quite natural expectation, having been reported to furnish substrata to 4 and 10 genera of epiphytic algae respectively. From the view point of discovery of new epiphytic species and forms, however, *Nereocystis luetkeana* is most remarkable among the hosts as it has been reported by Setchell & Gardner (1922, 1925) to be the host on which they discovered and described many new algae including 9 species of *Compsonema*, 2 *Myrionema* and one *Streblonema*, not to speak of varieties and forms.

As learnt from the present list, a host plant is often mentioned in the literature with its full specific name but sometimes only with its generic name. As for the genus *Laminaria*, 16 specific names can be picked up from the list. Of those species, *L. hyperborea** stands first in the number of epiphytes which comprise 50 genera and 66 species; next come *L. digitata* and *L. saccharina* whose epiphytes comprise 36 genera with 61 species and 24 genera with 29 species respectively. For the remaining 13 species of *Laminaria*, their respective epiphytes are recorded to be only one to six species in number.

In view of the literature cited, it may be said that the present list gives the general aspect of the epiphytic algae of the Laminariales plants known from the noteworthy regions of the world if not a complete enumeration of all the epiphytes ever reported.

**Laminaria hyperborea* in this paper includes *Laminaria Cloustonii* according to the conception of Du Rietz, G. E. (Nomenclature of *Laminaria digitata* (Huds.) Lamour. and *Laminaria hyperborea* (Gunn.) Foslie. *Sv. Bot. Tidskr.* 47 (1), 15-23. 1953).

Table I. Generic names of the hosts and the epiphytes that are treated in the present paper and the relation between them

| Epiphyte \ Host | Host | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|--------|--------|--------|---------------|----------|------------|----------|--------------|---------|---------|-------------|-----------|--------------|-------------|-------------|--------------|--------------|-----------|--------------|------------|-----------------|---------|----|----|
| | Chorda | Agarum | Alaria | Arthrothamnus | Costaria | Dictyonium | Ecklonia | Eckloniopsis | Egregia | Eisenia | Hedophyllum | Laminaria | Lessoniopsis | Macrocystis | Nereocystis | Pleurophycus | Pleuropterum | Postelsia | Pterygophora | Saccorhiza | Thalassiohyllum | Undaria | | |
| CYANOPHYCEAE | | | | | | | | | | | | | | | | | | | | | | | | |
| Xenococcus (2)* | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Calothrix (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| CHLOROPHYCEAE | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulothrix (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Acrochaete (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Bolbocoleon (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Pseudodictyon (1) | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Pseudopringsheimia (2) | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Ulvela (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Acrosiphonia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Chaetomorpha (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Cladophora (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Rhizoclonium (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Spongomorpha (3) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Ulva (2) | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Monostroma (2) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Codiolum (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Derbesia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Struvea (1) | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| PHAEOPHYCEAE | | | | | | | | | | | | | | | | | | | | | | | | |
| Ectocarpus (21) | + | .. | + | .. | .. | .. | .. | .. | + | .. | .. | + | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Endodictyon (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Entonema (2) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Laminariocolax (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Phaeostroma (2) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pylaiella (3) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Streblonema (9) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | + | + | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ralfsia (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Sphacelaria (4) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chaetopteris (1) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Halopteris (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Acrothrix (2) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chordaria (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Papenfussiella (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Microcoryne (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

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| Epiphyte \ Host | Host | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|--------|--------|--------|---------------|----------|--------------|----------|--------------|---------|---------|-------------|-----------|--------------|-------------|-------------|--------------|--------------|-----------|--------------|------------|-----------------|---------|----|
| | Chorda | Agarum | Alaria | Arthrothamnus | Costaria | Dictyoneurum | Ecklonia | Eckloniopsis | Egregia | Eisenia | Hedophyllum | Laminaria | Lessoniopsis | Macrocystis | Nereocystis | Pleurophycus | Pleuropterum | Postelsia | Pterygophora | Saccorhiza | Thalassiohyllum | Undaria | |
| Elachista (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Leptonema (1) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ascocyclus (5) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chilonema (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Clathrodiscus (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Compsoneuma (11) | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hecatonema (8) | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Myrionema (14) | .. | .. | .. | .. | .. | + | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Symphycarpus (1) | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Coilodesme (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Dictyosiphon (2) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Giraudia (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Myriotrichia (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Asperococcus (3) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Desmotrichum (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Halorhipis (1) | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Litosiphon (5) | + | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rhadinocladia (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Isthmoplea (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Desmarestia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tilopteris (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Laminaria (2) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| RHODOPHYCEAE | | | | | | | | | | | | | | | | | | | | | | | |
| Goniotrichum (1) | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Erythrocladia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Erythrotrichia (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Porphyropsis (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Porphyra (5) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Porphyrella (1) | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Acrochaetium (10) | .. | + | .. | .. | .. | .. | .. | + | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Audouinella (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chantransia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Kylinia (1) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rhodochorton (7) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Dumontia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Cruoriella (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

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| Epiphyte | Host | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|--------|--------|--------|---------------|----------|--------------|----------|--------------|---------|---------|-------------|-----------|--------------|-------------|-------------|--------------|--------------|-----------|--------------|------------|-----------------|---------|----|
| | Chorda | Agarum | Alaria | Arthrothamnus | Costaria | Dictyoneurum | Ecklonia | Eckloniopsis | Egregia | Eisenia | Hedophyllum | Laminaria | Lessoniopsis | Macrocystis | Nereocystis | Pleurophycus | Pleuropterum | Postelsia | Pterygophora | Saccorhiza | Thalassiohyllum | Undaria | |
| Peyssonelia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rhododermis (2) | .. | .. | + | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Cruoria (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Petrocelis (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Callophyllis (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Cirrularcarpus (1) | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Euthora (2) | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Kallymenia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | + | .. | .. | .. | .. |
| Clathromorphum (1) .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Corallina (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Dermatolithon (5) | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Epilithon (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Heteroderma (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Lithophyllum (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Lithothamnium (5) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Melobesia (3) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | + |
| Phymatolithon (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chondrus (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Phyllophora (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Plocamium (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Cystoclonium (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rhodophyllis (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Bonnemaisonia (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Gastroclonium (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Lomentaria (3) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Botryocladia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rhodymenia (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Antithamnion (8) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Callithamnion (3) | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Campylaephora (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ceramium (7) | .. | + | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Microcladia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Neoptilota (1) | .. | .. | .. | + | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pleonosporium (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | + |
| Plumaria (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ptilota (3) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | + |

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(Continued)

| Epiphyte | Host | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|--------|--------|--------|--------------|----------|--------------|----------|--------------|---------|---------|-------------|-----------|--------------|-------------|-------------|--------------|--------------|-----------|--------------|------------|-----------------|---------|----|
| | Chorda | Agarum | Alaria | Arthrohamnus | Costaria | Dictyoneurum | Ecklonia | Eckloniopsis | Egregia | Eisenia | Hedophyllum | Laminaria | Lessoniopsis | Macrocystis | Nereocystis | Pleurophycus | Pleuropterum | Postelsia | Pterygophora | Saccorhiza | Thalassophyllum | Undaria | |
| Ptilothamnion (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Spermothamnion (1) .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Acrosorium (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Apoglossum (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Delesseria (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hymenena (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hypoglossum (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Membranoptera (4) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pantoneura (3) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Phycodrys (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yendonia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Heterosiphonia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Amplisiphonia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Brongniartella (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chondria (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Laurencia (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Odonthalia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Placophora (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Polysiphonia (9) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pterosiphonia (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rhodomela (2) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Taenioma (1) | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

* Numeral in parentheses is the number of species enumerated in the genus concerned.

List of Epiphytes

CYANOPHYCEAE

PLEUROCPSALES

PLEUROCPSACEAE

1. *Xenococcus laminariae* J. FELDM.J. Feldmann (1954): On *Laminaria hyperborea* (blade).2. *X. crouanii* J. FELDM.J. Feldmann (1954): On *Laminaria ochroleuca* (blade).

Table II. Number of epiphyte genera reported to have been found on each of the 22 host genera

| Host | Number of Epiphytic algal genera | | | | |
|------------------|----------------------------------|---------|--------|--------|-------|
| | Cyano. | Chloro. | Phaeo. | Rhodo. | Total |
| Laminaria | 2 | 13 | 30 | 61 | 106 |
| Alaria | 0 | 1 | 11 | 15 | 27 |
| Chorda | 1 | 3 | 12 | 5 | 21 |
| Nereocystis | 0 | 0 | 5 | 5 | 10 |
| Egregia | 0 | 2 | 4 | 3 | 9 |
| Thalassiophyllum | 0 | 1 | 1 | 6 | 8 |
| Saccorhiza | 0 | 0 | 5 | 3 | 8 |
| Pterygophora | 0 | 0 | 0 | 7 | 7 |
| Macrocystis | 0 | 0 | 1 | 3 | 4 |
| Ecklonia | 0 | 0 | 0 | 4 | 4 |
| Agarum | 0 | 0 | 0 | 2 | 2 |
| Eisenia | 0 | 0 | 1 | 1 | 2 |
| Hedophyllum | 0 | 0 | 2 | 0 | 2 |
| Pleurophycus | 0 | 0 | 1 | 1 | 2 |
| Arthrothamnus | 0 | 0 | 0 | 1 | 1 |
| Costaria | 0 | 0 | 1 | 0 | 1 |
| Dictyoneurum | 0 | 1 | 0 | 0 | 1 |
| Eckloniopsis | 0 | 1 | 0 | 0 | 1 |
| Lessoniopsis | 0 | 0 | 1 | 0 | 1 |
| Pleuropterum | 0 | 0 | 0 | 1 | 1 |
| Postelsia | 0 | 0 | 1 | 0 | 1 |
| Undaria | 0 | 0 | 0 | 1 | 1 |

OSCILLATORIALES

OSCILLATORIACEAE

3. *Calothrix confervicola* (ROTH) AG.Printz (1926): On *Chorda filum*, *Laminaria* (blade).

CHLOROPHYCEAE

ULOTRICHALES

ULOTRICHACEAE

4. *Ulothrix flacca* (DILLW.) THUR.Jónsson (1901-3): On *Laminaria*.

CHAETOPHORACEAE

5. *Acrochaete repens* PRINGSH.Jónsson (1901-3), Kylin (1910), Waern (1952); On *Chorda filum*.Taylor (1937, 1957): On *Chorda* (cortex), *Laminaria* (cortex).

6. **Bolbocoleon piliferum** PRINGSH.
Kylin (1910): On *Chorda filum*.
Setchell & Gardner (1920), Kylin (1949): On *Chorda*.
7. **Pseudodictyon geniculatum** GARDN.
Setchell & Gardner (1920): On *Laminaria sinclairii*.
G. M. Smith (1944): On *Dictyoneurum californicum* (cortex).
8. **Pseudopringsheimia apiculata** SETCH. et GARDN.
Setchell & Gardner (1920), G. M. Smith (1944): On *Egregia menziesii*.
9. **P. confluens** (ROSENV.) WILLE
Kylin (1910, as *P. penetrans* KYLIN), Levring (1937): On *Laminaria hyperborea*.
10. **Ulvella fucicola** ROSENV.
Jónsson (1901-3): On *Laminaria digitata* (stipe).
CLADOPHORACEAE
11. **Acrosiphonia spinescens** (KÜTZ.) KJELLM.
Printz (1926): On *Laminaria* (old blade).
12. **Chaetomorpha melagonium** (WEB. et MOHR.) KÜTZ.
Kylin (1910): On *Laminaria hyperborea* (stipe).
13. **Cladophora rupestris** (L.) KÜTZ.
Kylin (1910): On *Laminaria hyperborea*.
14. **Cladophora** sp.
Sundene (1953): On *Laminaria saccharina*.
15. **Rhizoclonium kochianum** KÜTZ.
Sundene (1953): On *Chorda filum*.
16. **Spongomorpha arcta** (DILLW.) KÜTZ.
Printz (1926): On *Laminaria*.
17. **S. duriuscula** COLL. var. **tenuis** YAMADA
Yamada (1935): On *Thalassiophyllum clathrus* (blade).
18. **Spongomorpha** sp.
Jónsson (1901-3): On *Laminaria hyperborea*.
ULVALES
ULVACEAE
19. **Ulva angusta** SETCH. et GARDN.
G. M. Smith (1944): On *Egregia laevigata*.
20. **U. pertusa** KJELLM.
Tokida & Yama (1960): On *Laminaria japonica* and *L. religiosa* (blade).
MONOSTROMACEAE
21. **Monostroma lactuca** (L.) J. AG.
Printz (1926): On *Laminaria* and *Alaria*.

22. M. undulatum WITTR.

Jónsson (1901-3): On *Laminaria* (stipe).

CHLOROCOCCALES

CHLOROCHYTRIACEAE

23. Codiolum petrocelidis KUCK.

Jónsson (1901-3): On *Laminaria hyperborea* (stipe).

SIPHONALES

DERBESACEAE

24. Derbesia marina (LYNGB.) KJELLM.

Printz (1926): On *Laminaria hyperborea*.

Levring (1937): On *Laminaria* (stipe).

VALONIACEAE

25. Struvea delicatula KÜTZ.

Segawa (1938): On *Eckloniopsis radicata* (blade).

PHAEOPHYCEAE

ECTOCARPALES

ECTOCARPACEAE

26. Ectocarpus confervoides (ROTH) LE JOL.

Printz (1926): On *Laminaria* (stipe, blade).

f. **typica** KJELLM.

Rosenvinge & Lund (1941): On *Chorda filum*, *Laminaria digitata*.

f. **dasycarpa** (KUCK.) ROSENV.

Rosenvinge & Lund (1941): On *Laminaria* (stipe).

f. **penicillata** (AG.) KJELLM.

Rosenvinge & Lund (1941): On *Chorda filum*.

f. **pygmaea** (ARESCH.) ROSENV.

Rosenvinge & Lund (1941): On *Laminaria digitata* (stipe, blade).

G. M. Smith (1944, as var. *pygmaeus* (ARESCH.) KJELLM.): On Laminariales.

f. **siliculosa** (AG.) KJELLM.

Rosenvinge & Lund (1941): On *Chorda filum*, *Laminaria*.

27. E. cylindricus SAUND.

Setchell & Gardner (1925): On *Egregia menziesii*.

G. M. Smith (1944): On Laminariales, *Egregia menziesii*.

28. E. dimorphus SILVA

G. M. Smith (1944, as *E. variabilis* (SAUND.) G. M. SMITH.): On *Laminaria setchellii*, *Lessoniopsis littoralis*.

Silva (1957), Scagel (1957): On Laminariales.

29. E. draparnaldioides (CR.) KJELLM.

Kjellman (1883), Levring (1937): On *Laminaria digitata*.

- Kylin (1910): On *Laminaria digitata*, *L. hyperborea*.
 Printz (1926): On *Laminaria* (blade).
 Rosenvinge & Lund (1941): On *Laminaria digitata*, *L. saccharina*.
 J. Feldmann (1954): On *Laminaria* (blade), *Saccorhiza polyschides* (blade).
- 30. E. fasciculatus** (GRIFF.) HARV.
 Jónsson (1901-3): On *Laminaria digitata* f. *stenophylla*, *Alaria esculenta* (stipe, blade).
 Kylin (1910): On *Alaria*.
 Printz (1926): On *Laminaria digitata*.
 Levring (1937): On *Laminaria*.
 Taylor (1937, 1957): On Laminariaceae.
 Rosenvinge & Lund (1941): On *Laminaria digitata*, *Chorda filum*.
 J. Feldmann (1954): On *Chorda filum*.
 Jaasund (1957): On *Laminaria digitata*, *L. hyperborea*.
- 31. E. fructuosus** SETCH. et GARDN.
 G. M. Smith (1944): On *Nereocystis luetkeana*.
- 32. E. fusiformis** NAGAI
 Yamada & Tanaka (1944): On *Laminaria* sp. (blade).
 Nagai (1941): On *Thalassiophyllum clathrus* (stipe).
- 33. E. granulosooides** SETCH. et GARDN.
 G. M. Smith (1944): On *Nereocystis luetkeana*.
- 34. E. granulatus** (SMITH) AG.
 Rosenvinge & Lund (1941): On *Laminaria digitata*.
 J. Feldmann (1954, as *Giffordia granulosa* (SMITH) HAMEL): On *Laminaria saccharina*.
- 35. E. hiemalis** CROUAN
 Printz (1926): On *Laminaria hyperborea* (blade).
- 36. E. hincksiae** HARV.
 Jónsson (1901-3): On *Laminaria hyperborea*.
 Printz (1926): On *Laminaria* (old blade).
 Levring (1937): On *Saccorhiza bulbosa*.
 J. Feldmann (1954, as *Giffordia hincksiae* (HARV.) HAMEL): On Laminariales (blade), particularly on *Saccorhiza polyschides*.
- 37. E. ovatus** KJELLM.
 Printz (1926): On *Laminaria* (stipe).
- 38. E. oviger** HARV.
 Setchell & Gardner (1925), G. M. Smith (1944): On *Nereocystis luetkeana*.
 Scagel (1957): On *Nereocystis* (stipe).
- 39. E. penicillatus** (AG.) KJELLM.

- Jónsson (1901-3) : On *Laminaria digitata*, *Alaria esculenta*.
 Printz (1926) : On *Laminaria*.
40. **E. sandrianus** ZANARD.
 Rosenvinge & Lund (1941) : On *Laminaria digitata*.
41. **E. secundus** KÜTZ.
 J. Feldmann (1954, as *Giffordia secunda* (KÜTZ.) BATT.) : On *Saccorhiza polyschides* (apex of leathery segment of blade), *Laminaria digitata*.
42. **E. siliculosus** (HUDS.) LYNGB.
 Printz (1926) : On *Chorda filum*, *Laminaria digitata*, *L. saccharina*.
 Sundene (1953) : On *Chorda tomentosa*.
 J. Feldmann (1954, as *E. siliculosus* (DILLW.) LYNGB.) : On *Laminaria saccharina* (blade).
43. **E. terminalis** KÜTZ.
 Setchell & Gardner (1925) : On *Alaria fistulosa*.
 Printz (1926) : On *Laminaria digitata* (stipe).
44. **E. tomentosus** (Huds.) LYNGB.
 Printz (1926) : On *Laminaria digitata* f. *stenophylla* (blade).
45. **E. yezoensis** YAMADA et TANAKA
 Yamada & Tanaka (1944) : On *Laminaria* sp.
46. **Ectocarpus** sp.
 Tokida & Yama (1960) : On *Laminaria ochotensis*.
47. **Endodictyon infestans** GRAN
 Printz (1926) : Endozoic in Bryozoa on *Laminaria saccharina* (old blade).
 Levring (1937) : Endozoic in *Membranipora* on *Laminaria*.
48. **Entonema aequale** (OLTM.) KYLIN
 Rosenvinge & Lund (1941, as *Streblonema aequale* OLTM.), Sundene (1953), J. Feldmann (1954) : On *Chorda filum*.
49. **E. maculans** (P. DANG.) HAMEL
 J. Feldmann (1954) : On *Laminaria digitata* (endophytic in blade).
50. **Laminariocolax tomentosoides** (FARL.) KYLIN
 Jónsson (1901-3, as *Ectocarpus tomentosoides* FARL.) : On *Laminaria digitata*, *L. hyperborea*, *Alaria esculenta* (stipe).
 Printz (1926, as *Ectocarpus tomentosoides* subsp. *norvegicus* GRAN.) : On *Laminaria hyperborea* (blade), *L. saccharina*.
 Levring (1937), Taylor (1937, 1957) : On *Laminaria*.
 Rosenvinge & Lund (1941) : On *Laminaria digitata*.
 Sundene (1953) : On *Laminaria saccharina*.
 J. Feldmann (1954) : On *Laminaria digitata* (blade).

- Jaasund (1957) : On *Laminaria digitata*, *L. hyperborea*, *L. saccharina*.
51. **Phaeostroma pustulosum** KUCK.
 Jónsson (1901-3) : On *Chorda tomentosa*, *Laminaria saccharina* and f. *phyllitis*.
 Levring (1937) : On *Laminaria saccharina*.
52. **Phaeostroma** sp.
 Printz (1926) : On *Laminaria* (old blade).
53. **Pylaiella gardneri** COLLINS
 Setchell & Gardner (1925), G. M. Smith (1944) : On *Postelsia palmaeformis*.
54. **P. littoralis** (L.) KJELLM.
 Jónsson (1901-3) : On *Alaria esculenta*, *Saccorhiza dermatodea*.
55. **P. tenella** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Pleurophycus gardneri*.
 Scagel (1957) : On *Pleurophycus*.
56. **Streblonema aecidioides** (ROSENV.) FOSL.
 Jónsson (1901-3) : On *Laminaria digitata* f. *cucullata*, *L. saccharina* and f. *phyllitis*.
 Taylor (1937, 1957) : On *Laminaria* (endophytic).
57. **S. deformans** (P. DANG.) HAMEL
 J. Feldmann (1954) : On *Laminaria digitata* (endophytic in stipe, sometimes causing spiral twist of the stipe).
58. **S. evagatum** SETCH. et GARDN.
 Setchell & Gardner (1925), G. M. Smith (1944) : On *Laminaria setchellii*.
 Yamada & Tanaka (1944) : On *Laminaria* sp. (among paraphyses).
59. **S. irregulare** SAUND.
 Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
60. **S. myrionematoides** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Laminaria setchellii*.
61. **S. pacificum** SAUND.
 Setchell & Gardner (1925) : On *Alaria*.
62. **S. rugosum** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Alaria tenuifolia*.
 Scagel (1957) : On *Alaria tenuifolia* f. *tenuifolia*.
63. **S. scabiosum** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
64. **S. stilophorae** CR. var. **caespitosa** ROSENV.
 Jónsson (1901-3) : On *Laminaria digitata*.
- RALFSIACEAE
65. **Ralfsia deusta** (AG.) J. AG.

Kjellman (1883) : On *Laminaria* (stipe).

66. R. pusilla (STRÖMF.) FOSL.

Strömfelt (1888), Norum (1913) (cf. Levring, 1937) : On *Laminaria saccharina*.

Printz (1926) : On *L. saccharina* (blade).

SPHACELARIALES

SPHACELARIACEAE

67. Sphacelaria caespitula LYNGB.

Norum (1913) (cf. Levring 1937) : On *Laminaria*.

Rosenvinge & Lund (1950) : On *Laminaria hyperborea* (stipe).

Sundene (1953) : On *Laminaria digitata*, *L. hyperborea* (stipe).

68. S. cirrosa AG.

Sundene (1953) : On *Chorda filum*, *Laminaria saccharina* (blade).

Printz (1926) : On *Laminaria hyperborea* (stipe).

Levring (1937), Rosenvinge & Lund (1950) : On *Laminaria*.

69. S. furcigera KÜTZ.

Rosenvinge & Lund (1950) : On *Laminaria digitata*, *L. hyperborea*.

70. S. olivacea PRINGSH.

Jónsson (1901-3), Kylin (1907, as *Sphacelaria caespitula*, cf. Rosenvinge & Lund, 1950) : On *Laminaria hyperborea* (stipe).

71. Chaetopterus plumosa (LYNGB.) KÜTZ.

Kylin (1910) : On *Laminaria hyperborea*.

Printz (1926) : On *Laminaria* (hapteres).

Rosenvinge & Lund (1950) : On *Laminaria* (hapteres), *L. digitata* (stipe).

Svendsen (1959) : On *Alaria*.

72. Halopteris filicina (GRAT.) KÜTZ.

J. Feldmann (1954) : On *Laminaria hyperborea* (base of stipe).

CHORDARIALES

ACROTHRICEAE

73. Acrothrix gracilis KYLIN

Rosenvinge & Lund (1943) : On *Laminaria*.

74. A. pacifica OKAMURA et YAMADA f. **pacifica** INAGAKI

Yamada (1932), Tokida (1954), Inagaki (1954, 1958) : On *Chorda filum*.

f. **crassa** INAGAKI

Inagaki (1954, 1958) : On *Chorda filum*.

CHORDARIACEAE

75. Chordaria flagelliformis (MÜLL.) AG.

Svendsen (1959) : On *Laminaria digitata* (blade).

76. Papefussiella kuromo (YENDO) INAGAKI f. **kuromo** INAGAKI

Inagaki (1958) : On *Eisenia bicyclis*.

CORYNOPHLAEACEAE

77. *Microcoryne ocellatus* STRÖMF.Rosenvinge & Lund (1943) : On *Chorda filum*.

ELACHISTACEAE

78. *Elachista fucicola* (VELL.) ARESCH.Rosenvinge (1935) : On *Laminaria digitata*.79. *Leptonema fasciculatum* REINKETobler (1909) (cf. Printz, 1926) : On *Laminaria*.Jónsson (1901-3) : On *Laminaria*, *Alaria esculenta*, *Saccorhiza dermatodea*.Rosenvinge (1935) : *Laminaria digitata*.

MYRIONEMATACEAE

80. *Ascocyclus foecundes* (STRÖMF.) COTTONLevring (1937) : On *Laminaria*, *Alaria esculenta*.81. *A. hispanicus* SAUV.J. Feldmann (1954) : On *Laminaria hyperborea* (blade).82. *A. islandicus* H. JÓNSSONJónsson (1901-3) : On *Laminaria saccharina*.83. *A. orbicularis* (J. AG.) MAGNUSPrintz (1926) : On *Laminaria digitata*.84. *A. saccharinae* COTTONJaasund (1957) : On *Laminaria saccharina*.85. *Chilionema borgeseni* PRINTZPrintz (1926) : On *Laminaria digitata* (blade).86. *Clathrodiscus mandoulii* (SAUV.) HAMELJ. Feldmann (1954) : On *Saccorhiza polyschides* (apex of young blade).87. *Compsonema fructuosum* SETCH. et GARDN.Setchell & Gardner (1925) : On *Nereocystis luetkeana* (cyst).88. *C. myrionematoides* SETCH. et GARDN.Setchell & Gardner (1925), G. M. Smith (1944) : On *Nereocystis luetkeana* (stipe).89. *C. nummuloides* SETCH. et GARDN.Setchell & Gardner (1925) : On *Nereocystis luetkeana* (cyst).90. *C. pusillum* SETCH. et GARDN.Setchell & Gardner (1925), G. M. Smith (1944) : On *Nereocystis luetkeana*.91. *C. ramulosum* SETCH. et GARDN.Setchell & Gardner (1925) : On *Nereocystis luetkeana*.92. *C. secundum* SETCH. et GARDN.Setchell & Gardner (1925), G. M. Smith (1944) : On *Nereocystis luetkeana*.f. *terminale* SETCH. et GARDN.

- Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
 Yamada & Tanaka (1944) : On *Laminaria* sp., *Alaria angusta*.
93. *C. serpens* SETCH. et GARDN.
 G. M. Smith (1944) : On *Egregia menziesii*.
94. *C. sessile* SETCH. et GARDN.
 Setchell & Gardner (1925), Scagel (1957) : On *Hedophyllum sessile*.
95. *C. speciosum* (BÖRG.) SETCH. et GARDN. f. *piliferum* SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
96. *C. sporangiiferum* SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
97. *C. streblonematoides* SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
 Scagel (1957) : On *Nereocystis* (cyst).
98. *Hecatonema clavatum* SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
99. *H. diffusum* KYLIN
 Kylin (1910) : On *Laminaria digitata*, *L. hyperborea*.
 Sundene (1953) : On *Laminaria digitata*.
100. *H. lawsonii* SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Nereocystis* (sporophyll).
101. *H. maculans* (COLL.) SAUV.
 Printz (1926) : On *Laminaria hyperborea*, *L. saccharina*.
102. *H. reptans* (CROU.) SAUV.
 Levring (1937) : On *Laminaria digitata*.
103. *H. speciosum* (BÖRG.) COTTON
 Levring (1937) : On *Laminaria digitata*, *L. hyperborea*.
104. *H. terminale* (KÜTZ.) KYLIN
 Levring (1937) : On *Laminaria*.
 Sundene (1953) : On *Laminaria digitata*.
105. *H. variabile* SETCH. et GARDN.
 Setchell & Gardner (1925), G. M. Smith (1944) : On *Nereocystis luetkeana* (cyst).
106. *Myrionema aecidioides* (ROSENV.) SAUV.
 Kylin (1910) : On *Laminaria digitata*, *L. saccharina*.
 Levring (1937) : On *Laminaria saccharina*.
107. *M. alariae* (NORUM) PRINTZ
 Norum (1913, as *Phycocelis alariae* NORUM) : On *Alaria*.*

*Though Norum's paper has not been consulted by the writer, "*Alaria*" is here listed as the host because the species name of the epiphyte suggests so.

- Printz (1926) : On *Laminaria digitata* (endophytic in stipe).
108. **M. attenuatum** SETCH. et GARDN.
 Setchell & Gardner (1925), G. M. Smith (1944) : On *Nereocystis luetkeana* (stipe), *Laminaria farlowii*.
- f. **doliiforme** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Macrocystis pyrifera* (stipe).
109. **M. balticum** (REINKE) FOSL.
 Taylor (1937, 1957) : On *Laminaria*.
110. **M. compsonematoides** SETCH. et GARDN.
 Setchell & Gardner (1925), Scagel (1957) : On *Laminaria complanata*.
111. **M. coronnae** SAUV.
 Jónsson (1901-3) : On *Laminaria hyperborea* (sorus).
 Kylin (1910) : On *Laminaria digitata*.
 Setchell & Gardner (1925) : On *Laminaria pallida*.
 Taylor (1937, 1957) : On *Laminaria*.
 Levring (1937) : On *Laminaria*, *Alaria esculenta*.
 Sundene (1953) : On *Laminaria digitata*, *L. saccharina*.
 Kurogi (1954) : On *Alaria crassifolia*.
 J. Feldmann (1954) : On *Laminaria ochroleuca* (blade).
 Jaasund (1957) : On *Laminaria digitata* f. *stenophylla*.
- f. **angulatum** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Egregia menziesii*.
- var. **filamentosa** JÓNSSON
 Jónsson (1901-3) : On *Laminaria hyperborea* (sorus).
- f. **sterile** SETCH. et GARDN.
 Setchell & Gardner (1925), G. M. Smith (1944) : On *Nereocystis luetkeana*.
- f. **uniforme** SETCH. et GARDN.
 Setchell & Gardner (1925). On *Laminaria sinclairii*, *Alaria marginata*, *Costaria costata*.
112. **M. foecundum** (STRÖMF.) FOSL.
 Kylin (1910) : On *Laminaria digitata*, *Alaria esculenta*.
 Printz (1926), Taylor (1937, 1957) : On *Laminaria* spp.
- f. **divergens** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Nereocystis luetkeana* (sporophyll).
- f. **majus** SETCH. et GARDN.
 Setchell & Gardner (1925) : On *Laminaria ephemera*.
- f. **ramulosum** SETCH. et GARDN.
 Setchell & Gardner (1925), Scagel (1957) : On *Nereocystis luetkeana*.

- f. **simplissimum** SETCH. et GARDN.
Setchell & Gardner (1925), Scagel (1957) : On *Nereocystis luetkeana* (sporophyll).
- f. **subulatum** SETCH. et GARDN.
Setchell & Gardner (1925) : On *Nereocystis luetkeana*.
113. **M. globosum** (REINKE) FOSL.
Printz (1926) : On *Laminaria*.
114. **M. hecatonematoides** SETCH. et GARDN.
Setchell & Gardner (1925) : On *Nereocystis luetkeana* (cyst).
115. **M. laminariae** (ROSENV.) JÓNSSON
Jónsson (1901-3) : On *Laminaria saccharina* f. *phyllitis* (in outer membrane).
116. **M. minutissimum** SETCH. et GARDN.
Setchell & Gardner (1925) : On *Egregia menziesii*.
117. **M. obscurum** SETCH. et GARDN.
Tokida & Yama (1960) : On *Laminaria religiosa* (blade).
Setchell & Gardner (1925) : On *Costaria costata*.
118. **M. papillosum** SAUV.
J. Feldmann (1954) : On *Laminaria digitata* (blade).
119. **M. primarium** SETCH. et GARDN.
Setchell & Gardner (1925) : On *Costaria costata*.
G. M. Smith (1944) : On Laminariales.
- f. **acuminatum** SETCH. et GARDN.
Setchell & Gardner (1925) : On *Macrocystis pyrifera*.
120. **Symphiocarpus strangulans** ROSENV.
Kylin (1910) : On *Laminaria hyperborea* (stipe).
- DICTYOSIPHONALES
COILODESMACEAE
121. **Coilodesme fucicola** (YENDO) NAGAI
Nagai (1940) : On *Laminaria longipes* (blade).
- DICTYOSIPHONACEAE
122. **Dictyosiphon ekmani** ARESCH.
Kylin (1910) : On *Laminaria digitata* (blade).
123. **D. foeniculaceus** (HUDS.) GREV.
Rosenvinge & Lund (1947) : On *Chorda filum*.
- GIRAUDIACEAE
124. **Giraudia sphacelarioides** DERB. et SOL.
Rosenvinge & Lund (1947) : On *Chorda filum*, *Laminaria* (hapteres).
- MYRIOTRICHIAEAE
125. **Myriotrichia clavaeformis** HARV.

Rosenvinge & Lund (1947) : On *Chorda filum*.

PUNCTARIACEAE

126. *Asperococcus bullosus* LAMOUR.

Tobler (1909) (cf. Printz, 1926) : On *Laminaria*.

127. *A. echinatus* (MERT.) GREV.

Tobler (1909) (cf. Printz, 1926) : On *Laminaria*.

Rosenvinge & Lund (1947) : On *Laminaria digitata*, *L. hyperborea*.

f. *vermicularis* (GRIFF.) HARV.

Kylin (1910) : On *Laminaria saccharina* (blade).

128. *A. fistulosus* (HUDS.) HOOK.

Levring (1937) : On *Laminaria*.

129. *Desmotrichum undulatum* (J. AG.) REINKE

Rosenvinge & Lund (1947) : On *Chorda filum*, *Laminaria saccharina* (young frond).

130. *Halorhipis winstonii* (AND.) SAUND.

G. M. Smith (1944) : On *Egregia laevigata*.

131. *Litosiphon filiformis* (REINKE) BATT.

Printz (1926) : On *Laminaria digitata* f. *stenophylla*, *L. saccharina*.

Levring (1937), Rosenvinge & Lund (1947), Jaasund (1957) : On *Laminaria saccharina*.

Sundene (1953) : On *Laminaria digitata*, *L. saccharina*.

132. *L. laminariae* (LYNGB.) HARV.

Kylin (1910), Printz (1926), Levring (1937), J. Feldmann (1954), Jaasund (1957) :
On *Alaria esculenta*.

133. *L. pusillus* (CARM.) HARV.

Kylin (1910), Levring (1937), Sundene (1953), J. Feldmann (1954), Jaasund (1957) : On *Chorda filum*.

Printz (1926) : On *Chorda filum*, *Laminaria saccharina*, *Saccorhiza bullosa*.

Rosenvinge & Lund (1947) : On *Chorda filum*, *Laminaria saccharina*.

134. *L. tenuis* LEVRING

Levring (1937), Jaasund (1957) : On *Laminaria digitata*.

135. *L. yezoense* YAMADA et NAKAMURA

Yamada (1944), Yamada & Tanaka (1944) : On *Laminaria* (blade).

136. *Rhadinocladia farlowii* SCHUH

Taylor (1937, 1957) : On *Chorda*.

STRIARIACEAE

137. *Isthmoplea sphaerophora* (CARM.) KJELLM.

Jónsson (1901-3) : On *Laminaria digitata*.

Printz (1926) : On *Laminaria hyperborea* (stipe).

DESMARESTIALES

DESMARESTIACEAE

138. *Desmarestia viridis* (MÜLL.) LAMOUR.

Jónsson (1901-3) : On *Laminaria*.

Printz (1926) : On *Laminaria digitata*.

TILOPTERIDALES

TILOPTERIDACEAE

139. *Tilopteris mertensii* (SMITH) KÜTZ.

Printz (1926) : On *Laminaria* (hapteres).

LAMINARIALES

LAMINARIACEAE

140. *Laminaria angustata* KJELLM. (young plants).

Hasegawa & Fukuhara (1956) : On *Laminaria angustata* (old blade).

141. *L. japonica* ARESCH. (young plants).

Tokida & Ohiwa (1957) : On *Alaria crassifolia* (old stipe).

RHODOPHYCEAE

PROTOFLORIDEAE

PORPHYRIDIALES

PORPHYRIDACEAE

142. *Goniotrichum elegans* (CHAUV.) LE JOL.

Reinsch (1875, as *Callonema olivaceum* REINSCH, cf. Hamel, 1924) : On *Chorda filum*.

Tokida (1954) : On *Chorda*.

BANGIALES

ERYTHROPELTIDACEAE

143. *Erythrocladia subintegra* ROSENV.

Printz (1926) : On *Laminaria digitata* (blade).

144. *Erythrotrichia carnea* (DILLW.) J. AG.

Sundene (1953) : On *Laminaria saccharina*.

145. *E. welwitschii* (RUPR.) BATT.

G. M. Smith (1944) : On *Nereocystis luetkeana* (stipe).

146. *Porphyropsis coccinea* (J. AG.) ROSENV.

Rosenvinge (1909) : On *Laminaria digitata* (stipe).

Printz (1926) : On *Laminaria hyperborea* (stipe and blade margin).

BANGIACEAE

147. *Porphyra drachii* J. FELDM.

J. Feldmann (1954) : On Laminariales (blade), *Saccorhiza polyschides*, *Laminaria hyperborea*, *L. digitata*.

148. **P. miniata** (LYNGB.) AG.
 Printz (1926) : On *Laminaria*, *Alaria pylaii* (stipe).
 Levring (1937) : On *Laminaria* (stipe).
 Taylor (1937, 1957) : On *Laminaria* (base).
 Svendsen (1959) : On *Alaria*, *Laminaria digitata*.
149. **P. nereocystis** ANDERSON
 G. M. Smith (1944), Scagel (1957) : On *Nereocystis luetkeana* (stipe). *
150. **P. occidentalis** SETCH. et GARDN.
 G. M. Smith (1944) : On *Pterygophora californica* (stipe).
151. **P. woolhousiae** HARV.
 Levring (1953) : On *Macrocystis pyrifera*.
152. **Porphyrella gardneri** G. M. SMITH et HOLLENB.
 G. M. Smith (1944), Scagel (1957) : On *Laminaria setchellii*, *Egregia menziesii*.
- FLORIDEAE
 NEMALIONALES
 CHANTRANSIACEAE
153. **Acrochaetium daviesii** (DILLW.) NÄG.
 Sundene (1953) : On *Laminaria digitata*.
 Nakamura (1944, as *Rhodochorton daviesii* (DILLW.) DREW) : On *Ecklonia*.
 J. Feldmann (1954) : On *Laminaria hyperborea*, *Saccorhiza polyschides*.
154. **A. infestans** HOWE et HOYT
 J. Feldmann (1954) : Endozoic in stolons and hydrocaules of *Obelia geniculata* attached to *Laminaria* frond.
155. **A. laminariae** J. FELDM.
 J. Feldmann (1954) : On *Laminaria digitata* (stipe, semi-endophytic).
156. **A. pacificum** KYLIN
 Scagel (1957) : On *Agarum fimbriatum*.
157. **A. plumosum** (DREW) G. M. SMITH
 G. M. Smith (1944) : On *Laminaria setchellii*, *Egregia menziesii*, *Pterygophora californica*.
158. **A. sancti-thomae** BÖRG.
 Nakamura (1941, as *Rhodochorton sancti-thomae* (BÖRG.) NAKAMURA) : On *Ecklonia cava*.
159. **A. secundatum** (LYNGB.) NÄG.
 Sundene (1953) : On *Laminaria digitata*.
160. **A. strictum** (ROSENV.) HAMEL
 Sundene (1953) : On *Laminaria hyperborea* (stipe).
161. **A. variabile** (DREW) G. M. SMITH

- G. M. Smith (1944) : On *Laminaria setchellii*, *Pterygophora californica*.
 Scagel (1957) : On *Laminaria* and *Pterygophora*.
162. *A. virgatulum* (HARV.) J. AG.
 J. Feldmann (1954) : On *Laminaria hyperborea*.
163. *Audouinella efflorescens* (J. AG.) PAPENF.
 Sundene (1953, as *Grania efflorescens* (J. AG.) KYLIN) : On *Laminaria saccharina*.
164. *Chantransia thuretii* (BORN.) KYLIN β . *agama* ROSENV.
 Rosenvinge (1909) : On *Laminaria* (stipe).
165. *Kylinia alariae* (Jónsson) Kylin
 Jónsson (1901-3, as *Chantransia alariae* JÓNSS.), Kylin (1910), Levring (1937) :
 On *Alaria esculenta* (blade).
 Taylor (1937, 1957, as *Acrochaetium alariae* (JÓNSS.) BORN.) : On *Alaria*.
166. *Rhodochorton membranaceum* MAGNUS
 Jónsson (1901-3) : On *Laminaria*.
167. *Rh. penicilliform* (KJELLM.) ROSENV.
 Jónsson (1901-3) : On *Laminaria*.
168. *Rh. purpureum* (LIGHTF.) ROSENV.
 Taylor (1937, 1957) : On *Laminaria* (base).
169. *Rh. repens* JÓNSSON
 Jónsson (1901-3) : On *Alaria esculenta* (stipe).
170. *Rh. rothii* (THUR.) NÄG.
 Kylin (1910) : On *Laminaria hyperborea* (stipe).
 Rosenvinge (1923-4) : On *Laminaria hyperborea*, *L. digitata* (stipe and hapteres).
 Hamel (1928) : On *Laminaria saccharina* (stipe).
 Levring (1937) : On *Laminaria* (stipe).
171. *Rh. sparsum* (CARM.) KJELLM.
 Kjellman (1883) : On Laminariaceae (stipe).
 Tobler (1909) (cf. Printz, 1926) : On *Laminaria*.
172. *Rh. velutinum* (HAUCK) HAMEL
 Hamel (1928) : On *Laminaria hyperborea*.
- CRYPTONEMIALES
 DUMONTIACEAE
173. *Dumontia incrassata* (MÜLL.) LAMOUR.
 Printz (1926) : On *Laminaria hyperborea* (old blade).
- SQUAMARIACEAE
174. *Cruoriella armorica* CROUAN
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
175. *Peyssonelia rosenvingii* SCHMITZ

Jónsson (1901-3) : On *Laminaria hyperborea* (hapteres).

176. Rhododermis elegans CROUAN

Rosenvinge (1917) : On *Laminaria digitata* (hapteres).

G. M. Smith (1944) : On *Pterygophora californica* (sporophyll).

177. Rh. parasitica BATT.

Jónsson (1901-3) : On *Laminaria hyperborea* (stipe).

Taylor (1937, 1957) : On *Laminaria*.

Nagai (1941) : On *Laminaria platymeris*, *Arthrohamnus kurilensis*, *Alaria dolichorhachis*, *Thalassiophyllum clathrus* (holdfast, stipe).

CRUORACEAE

178. Cruoria pellita (LYNGB.) FRIES

Printz (1926) : On *Laminaria* (hapteres, stipe).

Levring (1937) : On *Laminaria* (stipe).

179. Petrocelis hennedyi (HARV.) BATT.

Jónsson (1901-3), Kylin (1910), Rosenvinge (1917), Levring (1937) : On *Laminaria hyperborea* (stipe).

Printz (1926) : On *Laminaria hyperborea*, *L. digitata* (stipe).

KALYMENIACEAE

180. Callophyllis laciniata (HUDS.) KÜTZ.

Levring (1937) : On *Laminaria* (stipe).

Sundene (1953) : On *Laminaria hyperborea*.

J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).

181. Cirrularcarpus gmelini (GRUN.) TOKIDA et MASAKI

Nagai (1941, as *Erythrophyllum gmelini* (GRUN.) YENDO) : On *Laminaria ochotensis*, *Alaria fistulosa*, *Thalassiophyllum clathrus* (holdfast).

182. Euthora cristata (L.) J. AG.

Kjellman (1883) : On *Laminaria digitata*.

Jónsson (1901-3) : On *Laminaria* (hapteres), *L. hyperborea*.

Kylin (1910) : On *Laminaria hyperborea* (stipe).

Rosenvinge (1931) : On *Laminaria hyperborea*, *L. saccharina* (hapteres).

Levring (1937), Sundene (1953) : On *Laminaria hyperborea*.

Taylor (1957) : On *Laminaria* (base).

183. E. fruticulosa (RUPR.) J. AG.

Kawabata (1931) : On *Agarum cribrosum*.

184. Kallymenia oblongifructa SETCH.

Scagel (1957) : On *Pleurophycus*, *Pterygophora* (stipe).

CORALLINACEAE

185. Clathromorphum circumscriptum (STRÖMF.) FOSL.

- Jónsson (1901-3) : On *Laminaria* (hapteres).
186. **Corallina officinalis** L.
Kjellman (1883) : On *Laminaria*.
187. **Dermatolithon ascripticum** (FOSL.) SETCH. et L. R. MASON
Mason (1953) : On *Laminaria sinclairii* (stipe).
188. **D. canescens** (FOSL.) FOSL.
Masaki & Tokida (1960) : On *Alaria crassifolia* (hapteres).
189. **D. crouanii** (FOSL.) HAMEL et LEMOINE
Jónsson (1901-3, as *Lithophyllum crouanii* FOSL.) : On *Laminaria hyperborea*
(stipe).
Foslie (1905) : On *Laminaria digitata*, *L. hyperborea* (hapteres, stipe).
190. **D. macrocarpum** (ROSAN.) FOSL.
Kjellman (1883, as *Melobesia macrocarpa* ROSAN.) : On *Laminaria digitata*.
Jónsson (1901-3) : On *Laminaria hyperborea* (stipe).
f. **laminariae** (CR.) FOSL.
Foslie (1898, as *Melobesia laminariae* CR.) : On *Laminaria hyperborea* (stipe).
191. **D. pustulatum** (LAMOUR.) FOSL.
Suneson (1943) : On *Laminaria hyperborea* (hapteres).
f. **laminariae** (CR.) FOSL.
J. Feldmann (1954) : On *Laminaria hyperborea* and *L. digitata* (hapteres, base
of stipe).
192. **Epilithon membranaceum** (ESP.) HEYDR.
Foslie (1905, as *Lithothamnium membranaceum* (ESP.) FOSL.) : On *Laminaria
digitata* (stipe).
Suneson (1943) : On *Laminaria digitata*.
Sundene (1953) : On *Laminaria saccharina*.
193. **Heteroderma nicholsii** SETCH. et L. R. MASON.
Mason (1953) : On *Eisenia arborea*.
194. **Lithophyllum orbiculatum** (FOSL.) FOSL.
Suneson (1943) : On *Laminaria hyperborea* (hapteres).
195. **Lithothamnium eckloniae** FOSL.
Foslie (1902, as *Lithothamnium capense* f. *eckloniae* FOSL.) : On *Ecklonia*
(stipe).
196. **Lithoth. haptericum** FOSL.
Foslie (1906) : On *Ecklonia* (hapteres).
197. **Lithoth. japonicum** FOSL.
Foslie (1899), Yendo *in* Okamura (1936) : On *Laminaria* (hapteres).
198. **Lithoth. vescum** FOSL.

- Foslie (1907) : On *Ecklonia* (hapteres).
 Yendo *in* Okamura (1936) : On *Ecklonia cava* (hapteres).
- 199. Lithothamnium** sp.
 Svendsen (1959) : On *Laminaria* (hapteres).
- 200. Melobesia farinosa** LAMOUR. (See "Addendum" on p. 105).
 Rosanoff (1866) : On *Ecklonia radiata*.
 Masaki & Tokida (1960) : On *Undaria undarioides* (hapteres).
- 201. M. limitata** (FOSL.) ROSENV.
 Rosenvinge (1917) : On *Laminaria digitata*.
 Levring (1937), Sundene (1953) : On *Laminaria*.
 Suneson (1943) : On *Laminaria saccharina*, *L. hyperborea* (blade).
- 202. M. minutula** FOSL. f. *lacunosa* FOSL.
 Suneson (1943) : On *Laminaria saccharina*.
- 203. Phymatolithon polymorphum** (L.) FOSL.
 Printz (1926) : On *Laminaria* (hapteres, stipe).
- GIGARTINALES
 GIGARTINACEAE
- 204. Chondrus crispus** (L.) STACKH.
 Rosenvinge (1931) : On *Laminaria hyperborea* (stipe).
- PHYLLOPHORACEAE
- 205. Phyllophora epiphylla** (FL. DAN.) BATT.
 Levring (1937) : On *Laminaria* (stipe).
- 206. Ph. palmettoides** J. AG.
 J. Feldmann (1954) : On *Laminaria hyperborea* (old stipe).
- PLOCAMIACEAE
- 207. Plocamium coccineum** (HUDS.) LYNGB.
 Kylin (1910), J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
 Rosenvinge (1931) : On *Laminaria hyperborea*.
 Sundene (1953) : On *Laminaria hyperborea* (hapteres).
 Printz (1926) : On *Laminaria* (hapteres, stipe).
 Levring (1937) : On *Laminaria* (stipe).
- RHODOPHYLLIDACEAE
- 208. Cystoclonium purpurascens** (HUDS.) KÜTZ.
 Printz (1926) : On *Laminaria* (stipe).
- 209. Rhodophyllis bifida** (GOOD. et WOODW.) KÜTZ.
 Levring (1937) : On *Laminaria hyperborea*.
- 210. Rh. dichotoma** (LEPECH.) GOBI
 Kjellman (1883) : On Laminariaceae.
- BONNEMAISONIALES

BONNEMAISONIACEAE

211. **Bonnemaisonia asparagoides** (WOODW.) AG.
 Rosenvinge (1923-4) : On *Laminaria saccharina*.
 Printz (1926) : On *Laminaria saccharina* (hapteres, stipe).
212. **B. intricata** (AG.) SILVA (sporophyte)
 Printz (1926, as *Trailiella intricata* (AG.) BATT.) : On *Laminaria* (hapteres, stipe).
 Sundene (1953, as *Trailiella intricata*) : On *Laminaria saccharina*.

RHODYMENIALES

CHAMPIACEAE

213. **Gastroclonium ovatum** (HUDS.) PAPENF.
 J. Feldmann (1954) : On *Laminaria* (base).
214. **Lomentaria articulata** (HUDS.) LYNGB.
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
215. **L. clavellosa** (TURN.) GAIL
 Jónsson (1901-3) : On *Laminaria hyperborea* (hapteres).
 Levring (1937) : On *Laminaria hyperborea*.
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
216. **L. rosea** (HARV.) THUR.
 Jónsson (1901-3) : On *Laminaria hyperborea* (hapteres).
 Levring (1937) : On *Laminaria hyperborea*.

RHODYMENIACEAE

217. **Botryocladia pseudodichotoma** (FARL.) KYLIN
 G. M. Smith (1944) : On *Macrocystis pyrifera* (holdfast).
218. **Rhodymenia palmata** (L.) GREV.
 Rosenvinge (1931), Sundene (1953) : On *Laminaria digitata*, *L. hyperborea* (stipe).
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
 var. **mollis** SETCH. et GARDN.
 G. M. Smith (1944) : On *Nereocystis luetkeana* (stipe).
 f. **prolifera** KÜTZ.
 Kylin (1910) : On *Laminaria hyperborea* (stipe).
219. **Rh. pseudopalmata** (LAM.) SILVA
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).

CERAMIALES

CERAMIACEAE

220. **Antithamnion boreale** (GOBI) KJELLM.
 Printz (1926) : On *Laminaria*.
221. **A. defectum** KYLIN

- G. M. Smith (1944) : On *Nereocystis luetkeana* (stipe).
222. **A. glanduliferum** KYLIN
 G. M. Smith (1944) : On *Nereocystis luetkeana* (stipe).
 Scagel (1957) : On *Laminaria* (blade).
223. **A. occidentale** KYLIN
 G. M. Smith (1944) : On *Nereocystis luetkeana* (stipe).
 Scagel (1957) : On *Nereocystis*.
224. **A. pacificum** (HARV.) KYLIN
 G. M. Smith (1944), Scagel (1957) : On *Nereocystis luetkeana* (stipe).
225. **A. plumula** (ELLIS) THUR.
 Printz (1926) : On *Laminaria* (hapteres, blade).
226. **A. uncinatum** GARDN.
 G. M. Smith (1944) : On *Macrocystis pyrifer*, *Nereocystis luetkeana*.
227. **Antithamnion** sp.
 Nagai (1941) : On *Alaria fistulosa* (holdfast).
228. **Callithamnion corymbosum** (SMITH) LYNGB.
 Printz (1926) : On *Laminaria* (blade).
 J. Feldmann (1954) : On *Chorda filum*.
229. **C. polyspermum** AG.
 Printz (1926) : On *Laminaria*.
230. **C. tetragonum** (WITH.) AG. var. **brachiatum** (BONN.) J. AG.
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe, blade).
231. **Campylaephora hypnaeoides** J. AG. f. **typica** NAKAMURA
 Nakamura (1950) : On *Laminaria*.
 f. **hamata** (COTTON) NAKAMURA
 Nakamura (1950) : On *Laminaria*.
 Tokida & Yama (1960) : On *Laminaria religiosa* (blade).
232. **Ceramium areschougii** KYLIN
 Kylin (1910) : On *Laminaria* spp. (blade).
233. **C. deslongchampsii** CHAUV.
 Levring (1937) : On *Laminaria digitata*.
234. **C. rubrum** (HUDS.) AG.
 Printz (1926) : On *Alaria*.
 Sundene (1953) : On *Chorda filum*, *Laminaria* spp.
235. **C. secundum** LYNGB.
 Printz (1926) : On *Laminaria* (stipe).
236. **C. septentrionalis** HENNING
 Printz (1926) : On *Laminaria* (blade).

237. *C. strictum* GREV. et HARV.
 Tobler (1909) (cf. Printz, 1926) : On *Laminaria*.
 Sundene (1953) : On *Chorda filum*, *Laminaria* spp.
238. *C. tenuissimum* (LYNGB.) J. AG.
 J. Feldmann (1954) : On *Chorda filum*.
239. *Microcladia californica* FARLOW
 G. M. Smith (1944) : On *Egregia*.
240. *Neoptilota asplenioides* (TURN.) KYLIN
 Nagai (1941) : On *Laminaria longipes*, *Alaria fistulosa*, *Pleuropterum paradiseum*, *Thalassiophyllum clathrus* (holdfast).
241. *Pleonosporium kobayashii* OKAMURA
 Okamura (1933) : On *Thalassiophyllum clathrus* (holdfast).
242. *Plumaria elegans* (BONN.) SCHMITZ
 Taylor (1937, 1957) : On *Laminaria* (base).
243. *Ptilota pectinata* (GUNN.) KJELLM.
 Printz (1926) : On *Laminaria* (stipe).
 Nagai (1941) : On *Thalassiophyllum clathrus* (holdfast).
244. *P. plumosa* (L.) Ag.
 Kylin (1910) : On *Laminaria hyperborea* (stipe).
 Printz (1926) : On *Laminaria* (hapteres, stipe).
 Levring (1937) : *Laminaria hyperborea*.
 Sundene (1953) : On *Laminaria digitata*, *L. hyperborea* (stipe).
245. *P. serrata* KÜTZ. *
 Taylor (1937, 1957) : On *Laminaria* (about the base).
246. *Ptilothamnion pluma* (DILLW.) THUR.
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
247. *Spermothamnion repens* (DILLW.) ROSENV.
 Rosenvinge (1923-4) : On *Laminaria digitata*, *L. hyperborea*.
- DELESSERIAACEAE
248. *Acrosorium reptans* (CR.) KYLIN
 J. Feldmann (1954) : On *Laminaria hyperborea* and *L. digitata* (hapteres, stipe).
249. *Apoglossum ruscifolium* (TURN.) J. AG.
 Sundene (1953) : On *Laminaria hyperborea*.
250. *Delesseria kurilensis* RUPR. (?)
 Ruprecht (1851) : On (?) *Thalassiophyllum*.
251. *D. sanguinea* (L.) LAMOUR.
 Kjellman (1883, as *Hydrolapathum sanguineum* (L.) STACKH.) : On *Laminaria* spp.

- Börgeesen (1902) : On *Laminaria hyperborea*.
 Printz (1926) : On *Laminaria, Alaria* (stipe).
252. *Hymenena smithii* KYLIN
 G. M. Smith (1944) : On *Pterygophora californica* (stipe).
253. *Hypoglossum woodwardii* KÜTZ.
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
254. *Membranoptera alata* (HUDS.) STACKH.
 Kjellman (1883, as *Delesseria alata* (HUDS.) LAMOUR.) : On Laminariaceae.
 Börgeesen (1902) : On *Laminaria hyperborea*.
 Jónsson (1901-3), Kylin (1910), J. Feldmann (1954) : On *Laminaria hyperborea*
 (stipe).
 Printz (1926), Levring (1937) : On *Laminaria* (stipe).
 Rosenvinge (1923-4) : On *Laminaria*.
255. *M. denticulata* (MONT.) KYLIN
 Nagai (1941) : On *Alaria fistulosa* (stipe).
256. *M. spinulosum* (RUPR.) J. AG.
 Kjellman (1883, as *Delesseria montagnei* KJELLM.) : On Laminariaceae.
257. *M. weeksiae* SETCH. et GARDN.
 G. M. Smith (1944) : On *Pterygophora californica*.
258. *Pantoneura angustissima* (GRIFF.) KYLIN
 Taylor (1937, 1957) : On *Laminaria* (base).
259. *P. baerii* (POST. et RUPR.) KYLIN
 Kjellman (1883, as *Delesseria baerii* RUPR.) : On Laminariaceae (hapteres).
260. *P. corymbosa* (J. AG.) KYLIN
 Kjellman (1883, as *Delesseria corymbosa* J. AG.) : On *Laminaria saccharina*
 (stipe).
261. *Phycodrys rubens* (HUDS.) BATT.
 Rosenvinge (1923-4) : On *Laminaria*.
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
262. *Ph. sinuosa* KÜTZ.
 Ruprecht (1851, as *Delesseria crenata* RUPR.) : On *Laminaria* (hapteres).
 Kylin (1910, as *Delesseria sinuosa* (GOOD. et WOODW.) LAMOUR.) : On
Laminaria hyperborea (stipe).
 Printz (1926) : On *Laminaria* (hapteres, stipe).
 Levring (1937) : On *Laminaria*.
263. *Yendonia crassifolia* (RUPR.) KYLIN
 Ruprecht (1851, as *Delesseria crassifolia* RUPR.) : Among rhizome of *Laminaria*
longipes.

DASYACEAE

264. *Heterosiphonia plumosa* (ELLIS) BATT.

J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).

RHODOMELACEAE

265. *Amplisiphonia pacifica* HOLLENBERG

Hollenberg (1939), Scagel (1953) : On Laminariales (holdfast).

Scagel (1957) : On *Pterygophora*.

266. *Brongniartella byssoides* (GOOD. et WOODW.) SCHMITZ

Sundene (1953) : On *Laminaria* spp.

267. *Chondria dasyphylla* (WOODW.) AG.

Tokida (1954) : On *Laminaria* (stipe).

268. *Laurencia obtusa* LAMOUR.

Tokida & Yama (1960) : On *Laminaria religiosa* (blade).

269. *L. pinnatifida* (GMEL.) LAMOUR.

Rosenvinge (1923-4) : On *Chorda filum*, *Laminaria digitata* (blade).

270. *Odonthalia dentata* (L.) LYNGB.

Printz (1926) : On *Laminaria*, *Alaria* (hapteres, stipe).

271. *Placophora binderi* (J. AG.) J. AG.

Baardseth (1941) (cf. Scagel, 1953) : On *Laminaria* (stipe).

272. *Pl. eckloniae* POCKOCK

Scagel (1953) : On *Ecklonia maxima* (stipe).

273. *Polysiphonia arctica* J. AG.

Taylor (1937, 1957) : On *Laminaria* (about the base).

274. *P. denudata* (DILLW.) KÜTZ.

J. Feldmann (1954) : On *Chorda filum*.

275. *P. elongata* (HUDS.) HARV.

Rosenvinge (1923-4) : On *Laminaria digitata*.

Printz (1926) : On *Laminaria* (stipe, blade).

Levring (1937) : On *Laminaria* (stipe).

276. *P. flexicaulis* (HARV.) COLLINS

Taylor (1937, 1957) : On *Laminaria*.

277. *P. japonica* HARV.

Segi (1951), Tokida (1954) : On *Laminaria*.

Tokida & Yama (1960) : On *Laminaria japonica*, *L. religiosa* (blade).

278. *P. nigrescens* (SMITH) GREV.

Sundene (1953) : On *Laminaria digitata* and other species.

279. *P. parasitica* (HUDS.) GREV.

Jónsson (1901-3) : On *Laminaria hyperborea* (hapteres).

280. *P. urceolata* (LIGHTF.) GREV.
 Jónsson (1901-3), Levring (1937) : On *Laminaria* (stipe).
 Kylin (1910), Rosenvinge (1923-4) : On *Laminaria hyperborea* (stipe).
 Printz (1926) : On *Laminaria*, *Alaria* (hapteres, stipe).
 Veldkamp (1950) : On *Laminaria*.
 var. *patens* (DILLW.) J. AG.
 J. Feldmann (1954) : On *Laminaria hyperborea* (stipe).
281. *P. violacea* (ROTH) GREV.
 Rosenvinge (1923-4) : On *Chorda filum*.
 Printz (1926) : On *Laminaria* (stipe, blade).
 Sundene (1953) : On *Chorda filum*, *Laminaria* spp.
 J. Feldmann (1954) : On *Chorda filum*, *Saccorhiza polyschides*.
282. *Pterosiphonia parasitica* (HUDS.) FALK.
 Printz (1926) : On *Alaria esculenta* (hapteres).
 Levring (1937) : On *Laminaria hyperborea*.
283. *Rhodomela lycopodioides* (L.) AG.
 Levring (1937) : On *Laminaria*.
 f. *typica* KJELLM. subf. *compacta* KJELLM.
 Kylin (1910) : On *Laminaria hyperborea*.
284. *Rh. subfusca* (WOODW.) AG.
 Rosenvinge (1923-4) : On *Laminaria*.
285. *Taenioma clevelandii* FARLOW
 G. M. Smith (1944) : On *Nereocystis luetkeana* (holdfast).

Summary

In the present paper are enumerated 285 species of epiphytic marine algae which have been reported in 69 publications to grow upon or in the thallus of Laminariales plants belonging to 22 genera. Of these epiphytes, 2 genus and 3 species belong to Cyanophyceae, 16 genera and 22 species to Chlorophyceae, 37 genera and 116 species to Phaeophyceae, and 71 genera and 144 species to Rhodophyceae. Some relations between the hosts and the epiphytes are considered.

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Addendum : After the manuscript was sent to press, Ass. Professor T. Masaki collected by dredging at depths of about 30 m. a number of specimens of *Laminaria japonica* in the western part of Aomori Bay, off Imabetsu-machi, Aomori prefecture, on November 5, 1960. The specimens were all densely infested on the surface of the blade with reddish-purple thin crusts of *Melobesia farinosa* and with greenish-grey colonies of a Bryozoa.