

# THE ALGAE TRANSPORTED ON DRIFTING OBJECTS AND WASHED ASHORE ON THE NETHERLANDS' COAST

by

J. A. W. LUCAS

(Leiden).

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## Introduction.

Little attention has been paid till now to the algae, transported to the Netherlands coast on drifting objects. About a century ago T. D. Vrijdag Zijnen and G. Bisschop (near Scheveningen,  $\pm$  1845), and L. H. Buse (between Wijk aan Zee and Zandvoort,  $\pm$  1840—1847) were the first to pay attention to this subject. The material collected, especially that by the first two investigators, is mentioned in the *Prodromus Fl. Bat.* (1853). The book of Van Goor (1923) contains a chapter on these algae, in which, however, only few new observations occur. The author is much indebted to Dr Joséphine Th. Koster for her kind help, as well as to Dr S. J. v. Ooststroom. The material, collected by Vrijdag Zijnen, Bisschop and Buse is almost completely present in the collections of the 'Rijksherbarium' and the 'Koninklijke Nederlandse Botanische Vereniging', Leiden. The material, collected during the last few years has for the greater part been brought together by the present author, and furthermore especially by K. Swennen (Den Helder), J. Stock (Amsterdam), A. Mulder (Haarlem) and P. Leenhouts (Scheveningen). This material belongs to the collection of the Rijksherbarium, Leiden, but most of it is, for the time being, put under the charge of the "Comité ter Bestudering van de Nederlandse Mariene Flora en Fauna" ("Committee on the Netherlands' Marine Flora and Fauna") and temporarily preserved in "Het Filiaal", Leiden.

## Origin of the material.

The detached algae and the floating bunches of cork, as used on French fishing boats, are transported passively, so that a matter of first importance is to know the occurrence and direction of the sea currents. Carruthers (1925) has found that the Gulf stream splits into two branches, S.W. of Ireland. The smaller southern branch reaches the North Sea through the Channel and the Strait of Dover; the large one flows around Scotland and the Faroes, bends to the South and joins the southern branch, after which they flow on to the German Bight and the Danish Coast. The place of the junction depends on the direction of the wind, and is

situated near the Frisian islands. As the algae are mostly washed ashore during gales from the S.W., it is probable that most of them are of more southern origin, though also material from the North can be found washed ashore, especially on the Frisian islands.

From the investigations by A. E. H. M. Bloklander and J. Brouwer (1946—1947) and from oral communications of Bloklander and L. B. Holt-huis it appears that among the transported animals several are of more southern origin: *Cantharidus exasperatus*, *Diodora apertura*, *Gibbula umbilicalis*, *Lutraria magna*, *Paphia aurea*, *Tricolia pullus picta*, *Trivia monacha* (Mollusca), *Stephanosella biaperta* (Bryozoa), *Balanus perforatus*, *Balanus tintinnabulum*, *Lepas pectinata* (Cirripedia), *Naesa bidentata* (Isopoda), *Apeudes talpa* (Tanaidaceae) and *Eunice harrasii* (Polychaeta).

According to Van Goor (1923) the following algae are of more southern origin: *Cystoseira fibrosa*, *Dasya pedicellata* (*D. elegans*), *Gastroclonium ovale*, *Grateloupia filicina*, *Padina pavonia* and *Sargassum natans*. Furthermore the algae *Antithamnionella sarniensis*, *Falkenbergia hillebrandii*, *Gastroclonium clavatum* and *Acrosorium reptans* also originate from more southern regions. Only few specimens can with certainty be considered as being of more northern origin, e.g. the molluscs *Malletia obtusa* and *Astarte montagui* and the alga *Ptilota plumosa*. This agrees with the views of Van Goor and of Bloklander and Brouwer.

In most cases this place of origin is the Channel, which can be concluded from the great frequency of some algae, which do not occur in detached state north of the Channel, as *Antithamnionella sarniensis*, *Falkenbergia hillebrandii* and *Gastroclonium ovale*. Also the Cirripede *Balanus perforatus* is very common on drifting objects.

We now have to consider the question, whether the material comes from a greater distance than from the Channel. This has certainly to be assumed for *Sargassum natans*, but for other material it is doubtful. Even the following three species, not mentioned for the English coast, but for still more southern regions, probably occur in the Channel:

1. *Dasya pedicellata* (Ag.) Ag. A specimen of this species has been found in 1844 on *Himantalia*, washed ashore at Zandvoort. In 1948 a detached specimen of *Dasya pedicellata*, showing a great number of tetraspores, was washed ashore on the beach near Hellevoetsluis. The good condition of this specimen suggests, that it has not been transported over a great distance, and that it might even have grown on the Netherlands coast. This suggests the possibility that this species is a native of the Channel coasts.

2. *Falkenbergia hillebrandii* (Born.) Falkenb. As this species occurs practically in all adventitious material, it is probable that its origin is more or less near to the Netherlands coast. Moreover the species has been found on the same floating object as *Antithamnionella sarniensis*.

3. *Gastroclonium clavatum* (Roth) Ardiss. This species was found on a piece of cork, which was overgrown with the species *Antithamnionella sarniensis*, characteristic for the Channel; from this it may be concluded, that the above-mentioned *Gastroclonium* originates from the Channel. Also the animals, drifted ashore on the same day, indicate an origin from the Channel.

IJzerman (1937) has studied the small pieces of rock, to which algae were found attached and which were washed ashore between Zandvoort and Katwijk. The origin of these rocks proved to be the coast of Normandy and the South Coast of England.

#### Substratum.

Often algae are washed ashore, epiphytic on large brown seaweeds, such as: *Ascophyllum nodosum* (L.) Le Jol.; *Chorda filum* (L.) Lamour.; *Fucus ceranoides* L.; *Fucus serratus* L.; *Fucus spiralis* L.; *Fucus vesiculosus* L.; *Fucus serratus* L. × *Fucus vesiculosus* L.; *Halidrys siliquosa* (L.) Lyngb.; *Himanthalia lorea* (L.) Lyngb.; *Laminaria digitata* (L.) Lamour.; *Laminaria saccharina* (L.) Lamour.; *Saccorhiza bulbosa* (Huds.) de la Pyl.; *Sargassum natans* (L.) Børg. Especially the stipes of *Himanthalia* are very rich in epiphytes; as many as 71 different species have been found on those parts.

Another rich substratum is formed by bunches of cork, as are in use on board of French fishing boats, and also floating pieces of wood (e. g. beams). Also on smaller objects the algae can be transported, as there are cinders, egg capsules of rays and skates, clumps of *Buccinum* eggs, inner shells of *Sepia*, etc.

#### Condition of the material.

After having been drifted ashore, the material is mostly in a very good condition, and often apparently still alive. It is striking, that most plants, even when they are fertile, are of a very small size. Fructification of these plants sometimes occurs at other periods than is mentioned for the plants in their normal habitat.

#### Duration of the transport.

This can be estimated at one or two months, as may be derived from the following observation. On 19—21 September 1948 algae were washed ashore on the coast of Zuid-Holland in a great number, but in a smaller number on that of Noord-Holland. They were probably detached by a gale blowing from the S.W. on the fifth of August. After the gale of 19—21 September material was washed ashore on the 24th of October and *Himanthalia* especially South of Noordwijk. On the 24th of November much material was cast on the dike at Den Helder. All this material probably hails from the same source, as results from the study of the flora as well as the fauna.

It is an interesting fact that the bunches of cork, the beams, etc. are transported more quickly than the drifting algae. On the 24th of October e. g. the algae were mainly washed ashore south of Noordwijk, while the greater part of the cork, beams, etc. were found north of Noordwijk.

Egg capsules of rays and skates are washed ashore usually about one or two weeks after the algae.

## List of the species drifted ashore.

This list contains the names of 171 species; 65 of them have not been previously recorded from the Netherlands coasts; these have been marked with an asterisk.

To the material which has not been studied by the author, either (Van Goor) or (Prodr.) has been added.

The phorophyta or substrata are mentioned as far as these data were available.

## CYANOPHYCEAE.

*Calothrix confervicola* Ag. — Noordwijkerhout-Noordwijk, 20-9-1948, *Lucas 127*, *Chorda filum*.

\**Hydrocoleum lyngbyaceum* Kütz. — Kijkduin-Terheiden, 21-11-1948, *Lucas 188*, *Himanthalia lorea*.

*Lyngbya semiplena* Ag. — Noordwijk-Katwijk, 15-11-1949, *Lucas 494*, bunch of cork.

\**Oscillatoria nigro-viridia* Thwaites — Scheveningen, 30-11-1947, *Lucas 279*, *Himanthalia lorea*.

\**Oscillatoria planctonica* Wolonszynska — Noordwijk-Katwijk, 14-12-1947, *Lucas 325*, *Himanthalia lorea*; Katwijk-Wassenaarse Slag, 10-12-1947, *Lucas 332*, *Laomedea geniculata*.

## CHLOROPHYCEAE.

*Bryopsis plumosa* (Huds.) Ag. — Syn. *B. hypnoides* Lamour. — Scheveningen, 30-11-1947, *Lucas 275*, *Himanthalia lorea*.

*Cladophora arcta* (Dillw.) Kütz. — Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas 246*, *Himanthalia lorea*.

*Cladophora flexuosa* (Griff.) Harv. — Zandvoort, 1-1852, *Buse*, Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas 145*, *Himanthalia lorea*; Katwijk, 11-3-1949, cork.

*Cladophora fracta* (Dillw.) Kütz. — Den Helder, 3-1-1950, *C. den Hartog*, wood.

*Cladophora lanosa* (Roth) Kütz. — Scheveningen, *Vrijdag Zijnen*, *Fucus vesiculosus*.

\**Cladophora prolifera* (Roth) Kütz. — Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas 147*, *Himanthalia lorea*.

*Cladophora refracta* (Roth) Kütz. — Scheveningen, 23-12-1947, *Leenhouts 160*, cork.

*Cladophora rupestris* (L.) Kütz. — Zandvoort-Katwijk, 11-3-1949, *Lucas 89*, egg capsule of *Raja clavata*; Noordwijk, 12-12-1948, *Lucas 149*, *Ascophyllum nodosum*; *ibid.*, 13-11-1949, *Lucas 455*, egg capsule of *Raja clavata*; Noordwijk-Katwijk, 15-11-1949, *Lucas 521*, egg-capsule of *Raja clavata*; Kijkduin-Terheiden, 21-11-1948, *Lucas 70* and *Lucas 213*, *Himanthalia lorea*.

*Codium fragile* (Sur.) Hariot — Syn. *C. mucronatum* J. Ag. var. *tomentosoides* van Goor — In bunches.

\**Codium tomentosum* (Huds.) Stackh. — Noordwijkerhout-Noordwijk,

10-10-1948, *Lucas 152*, *Himanthalia lorea*; Scheveningen, 30-11-1947, *Lucas 272*, *Himanthalia lorea*.

\**Endoderma viride* (Reinke) Lagerh. — Noordwijk, 13-11-1949, *Lucas 453*, *Griffithsia cf. barbata*.

*Enteromorpha clathrata* (Roth) J. Ag. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 31* and *Lucas 212*, wood; Katwijk, 15-10-1938, *Lacourt*, bunch of cork; Scheveningen, 13-10-1946, *Leenhouts*, *Ascophyllum nodosum*; (this species?) Scheveningen, 19-10-1941, *Koster 655*, inner shell of *Sepia officinalis*.

*Enteromorpha compressa* (L.) Grev. — IJmuiden, 19-12-1949, *Mulder 16*; bunch of cork; IJmuiden-Bloemendaal, 19-12-1949, *Mulder 17*; Bloemendaal, 13-11-1949, *Stock (1)* and *Hazevoet*, cork; Zandvoort, XI-1847, *Buse*, *Fucus vesiculosus*; Noordwijk-Katwijk, 14-12-1947, *Lucas 324*, *Ascophyllum nodosum*; *ibid.*, 15-11-1949, *Lucas 502*, bunch of cork; Scheveningen, 13-10-1946, *Leenhouts*, *Ascophyllum nodosum*; *ibid.*, 16-11-1947, *Lucas 298*, bunch of cork; *ibid.*, 21-9-1948, *Leenhouts 213*, wood; *ibid.*, 22-9-1948, *Lucas 242*, *Himanthalia lorea*.

*Enteromorpha erecta* (Lyngb.) J. Ag. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 170*, wood.

\**Enteromorpha flexuosa* (Wulf.) J. Ag. — Zandvoort, 18-12-1949, *Stock 2*, box.

*Enteromorpha intestinalis* (L.) Link — Den Helder, 24-11-1948, *Swennen 37*, *Himanthalia lorea*; Noordwijk, 24-10-1948, *Lucas 219*, cork; Scheveningen, 18-10-1947, *Leenhouts 133*, wood.

*Enteromorpha linza* (L.) J. Ag. — Wijk aan Zee, XII-1841, *Buse*, stone; Noordwijk-Katwijk, 15-11-1949, *Lucas 492*, bunch of cork; Scheveningen, 22-10-1941, *Creutzberg*, cork.

\**Enteromorpha marginata* J. Ag. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 171*, wood; Scheveningen, 22-9-1948, *Lucas 208*, wood.

\**Enteromorpha prolifera* (Müll.) J. Ag. — Zandvoort, 4-3-1949, *Mulder 1*, egg capsule of *Raja clavata*.

*Monostroma spec.* — Scheveningen, 6-12-1947, *Leenhouts 202*, *Fucus vesiculosus*.

\**Protococcus marinus* Kütz. — Katwijk, 30-10-1949, *Lucas 442*, *Patella vulgata*.

\**Rhizoclonum implexum* (Dillw.) Lyngb. — Kijkduin-Terheiden, 21-11-1948, *Lucas 245*, *Himanthalia lorea*.

*Rhizoclonium riparium* (Roth) Harv. — IJmuiden, 19-12-1949, *Mulder 18*, bunch of cork.

*Ulva lactuca* L. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 53*, cork; Noordwijk-Katwijk, 28-2-1949, *Lucas 14*, lime-stone.

*Urospora penicilliformis* (Roth) Aresch. — Noordwijk, 28-2-1949, *Lucas 18*, lime-stone; *ibid.*, 8-5-1949, *Lucas 334*, clump of *Buccinum* eggs.

#### PHAEOPHYCEAE.

*Ascophyllum nodosum* (L.) Le Jol. — Bunches are extremely common.

\**Asperococcus bullosus* Lamour. — Noordwijk, X-1948, *Rijkers*, cork.

\**Asperococcus* cf. *compressus* Griff. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 224*, porous stone.

*Asperococcus echinatus* (Mert.) Grev. — Texel, 7-10-1946, *Blokländer*, bunch of cork; Den Helder, 27-8-1948, *Swennen 85*, bunch of cork; *ibid.*, 3-10-1948, *Swennen 75*, box; IJmuiden, 26-8-1948, *Stock 3*, wood; *ibid.*, 19-12-1949, *Mulder 19*, bunch of cork; Bloemendaal, 13-11-1949, *Stock (4)* and *Hazevoet*, cork; Noordwijk, 4-8-1946, *Rijkers*, bunch of cork; *ibid.*, 20-9-1948, *Lucas 69*, bunch of cork; Scheveningen, 18-10-1947, *Leenhouts 129*, wood; *ibid.*, 16-11-1947, *Lucas 68*, beam; *ibid.*, *Lucas 192*, little stone; Schouwen, 27-12-1947, *Viergever*, box.

\**Bifurcaria tuberculata* (Kütz.) Stackh. — Kijkduin-Terheiden, 1-10-1948, *Blokländer*, *Himantalia lorea*.

\**Chaetopteris plumosa* (Lyngb.) Kütz. — Hondsbosse Zeewering-Noordwijkerhout, 16/20-4-1949, *Mulder 2*, egg capsules of *Raja clavata*; Zandvoort-Katwijk, 11-3-1949, *Lucas 44*, *ibid.*; Noordwijk-Katwijk, 15-11-1949, *Lucas 525*, *ibid.*; Scheveningen, 3-3-1949, *Lucas 336*, *ibid.*

*Chorda filum* (L.) Lamour. — Bunches are more or less common.

*Cladostephus spongiosus* (Lightf.) Ag. — Zandvoort-Noordwijk, 11-3-1949, *Lucas 43*, egg capsule of *Raja clavata*; Noordwijk-Katwijk, 15-11-1949, *Lucas 523*, *ibid.*

*Colpomenia sinuosa* (Roth) Derb. et Sol. — Only detached. Terschelling (van Goor); Bloemendaal; Noordwijkerhout; Noordwijk; Katwijk; Terheiden-Hoek van Holland.

*Cystoseira discors* (L.) J. Ag. — Once a bunch (Prodr.).

*Cystoseira ericoides* (L.) J. Ag. — Once a bunch (Prodr.).

*Cystoseira fibrosa* (Huds.) Ag. — Bunches are fairly rare. Once on an egg capsule of *Raja clavata*, Kijkduin-Hoek van Holland, 19-10-1946, *Blokländer*.

*Desmarestia aculeata* (L.) Lamour. — Scheveningen (Prodr.).

\**Dictyopteris membranacea* (Stackh.) Batt. — IJmuiden, 19-12-1949, *Mulder 20*, bunch of cork.

*Dictyota dichotoma* (Huds.) Lamour. — Noordwijk-Katwijk, 15-11-1949, *Lucas 499*, bunch of cork.

*Ectocarpus confervoides* (Roth) Le Jol. — IJmuiden, 19-12-1929, *Mulder 21*, bunch of cork; Bloemendaal, 13-11-1949, *Stock (5)* and *Hazevoet*, cork; Zandvoort, 18-12-1949, *Stock 7*, box; Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 211*, wood; *ibid.*, 20-1-1949, *Lucas 296*, wood; Noordwijk-Katwijk, 15-11-1949, *Lucas 467*, bunch of cork; Scheveningen, 23-12-1947, *Leenhouts*, cork.

*Ectocarpus fasciculatus* (Griff.) Harv. — Texel, 7-10-1946, *Blokländer*, bunch of cork; Hellevoetsluis, 31-10-1948, *Mennema*, wood.

*Ectocarpus granulatus* (Engl. Bot.) Ag. — Zandvoort, 1-1844, *Buse*; Zandvoort, 18-12-1949, *Stock 6*, box; Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 210*, wood; (this species?) Noordwijk, 8-5-1949, *Lucas 304*, beam; Kijkduin, 20-11-1949, *Lems*, beam.

\**Ectocarpus* cf. *hincksiae* Harv. — Zandvoort-Noordwijk, 25-1-1948, *Lucas 271*, cork.

*Ectocarpus irregularis* Kütz. — Texel, 7-10-1946, *Blokländer*, bunch of cork; perhaps at Scheveningen, 18-10-1947, *Leenhouts 128*, *Phyllitis fascia*.

*Ectocarpus paradoxus* Mont. — (this species?) IJmuiden, 19-12-1949, *Mulder 22*, bunch of cork; Kijkduin-Hoek van Holland, 19-10-1946, *Blokländer*, bunch of cork.

*Ectocarpus rufus* Ag. — Scheveningen, 1843, *Bisschop*, *Polysiphonia lanosa* (det. Kützing). For want of sporangia the material can not be identified with certainty.

\**Ectocarpus sandrianus* Zanard. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 209*, porous stone.

*Ectocarpus tomentosus* (Huds.) Lyngb. — Terschelling, 11-8-1949, *Lucas 353*, *Fucus vesiculosus*; Noordwijk, 20-9-1948, *Lucas 165*, bunch of cork; Scheveningen, *Vrijdag Zijnen*, *Ascophyllum nodosum*.

\**Ectocarpus virescens* Thur. — Noordwijk-Katwijk, 15-11-1949, *Lucas 464*, cork.

*Elachista fucicola* (Vellay) Aresch. — Terschelling, 12-8-1949, *Lucas 357*, *Fucus vesiculosus*; Noordwijkerhout-Noordwijk, 20-9-1948, *Lucas 166* and *Lucas 293*, *ibid.*; Noordwijk, 24-10-1949, *Lucas 431*, *ibid.*; Scheveningen, e. g. 1843, *Vrijdag Zijnen*, *van den Bosch*, *Bisschop*, *van der Capelle* and *Bondam*, *ibid.*; *ibid.*, 4-10-1946, *Leenhouts*, *Fucus vesiculosus*; Hoek van Holland, 30-12-1946, *Lucas*, *ibid.*

*Elachista scutulata* (Sm.) Duby — Den Helder (van Goor); Noordwijkerhout-Noordwijk, 20-9-1948, *Lucas 167*, *Himanthalia lorea*; Noordwijkerhout, 4-8-1946, *Rijkers*, *ibid.*; Scheveningen, *Vrijdag Zijnen*, *ibid.*; *ibid.*, 6-9-1938, *Koster 234*, *ibid.*; *ibid.*, 21-9-1948, *Leenhouts*, *ibid.*

\**Eudesme virescens* (Carm.) J. Ag. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 128* and *Lucas 222*, on wood, *Fucus vesiculosus* and a feather.

*Fucus ceranoides* L. — Bunches are fairly rare.

*Fucus serratus* L. — Bunches are more or less common. Often on floating *Ascophyllum nodosum*.

*Fucus spiralis* L. — Bunches are not so rare, sometimes common.

*Fucus vesiculosus* L. — Bunches are very common. Sometimes on floating objects as beams, e. g. Noordwijk, 8-5-1949, *Lucas 321*.

*Fucus serratus* L. × *Fucus vesiculosus* L. — Noordwijk-Katwijk, 6-12-1949, *Lucas 535*, 2 bunches.

*Halidrys siliquosa* (L.) Lyngb. — Bunches are more or less common.

*Herponema velutinum* (Grev.) J. Ag. — Zandkreek, 1852, *van den Bosch*, *Himanthalia lorea*.

*Himanthalia lorea* (L.) Lyngb. — Bunches are common.

*Laminaria digitata* (L.) Lamour. — Bunches are rare.

*Laminaria saccharina* (L.) Lamour. — Bunches are rare. Once on an iron buoy at Noordwijkerhout, 4-8-1946, *Rijkers*.

*Laminaria* spec. — Noordwijkerhout-Noordwijk, 10-10-1948, *Lucas 232*, *Himanthalia lorea*.

\**Mesogloia vermiculata* (Engl. Bot.) Le Jol. — Den Helder, 3-10-1948, *Swennen 74*, box; Wassenaarse Slag-Scheveningen, 23-10-1947, *Lucas 237*, beam; Scheveningen, 17-9-1941, *Creutzberg*, *Himanthalia lorea*.

*Padina pavonia* (L.) Lamour. — Scheveningen (Prodr.).

*Pelvetia canaliculata* (L.) Decne et Thur. — Once a bunch (Prodr.).

*Phyllitis fascia* (Müll.) Kütz. — Katwijk, 9-2-1946, *Rijkers*, light-buoy

N. F. 4; Scheveningen 18-10-1947, *Leenhouts* 132, beam; *ibid.*, 16-11-1947, *Lucas* 228, beam; *ibid.*, 23-12-1947, *Leenhouts* 164, cork; *ibid.*, 22-9-1948, *Lucas* 227, cork; Schouwen, 27-12-1947, *Viergever*, box.

*Pilayella littoralis* (L.) Kjellm. — Noordwijk, 28-2-1949, *Lucas* 17, *Fucus vesiculosus*; Katwijk, 11-3-1949, *Lucas* 158, cork; Katwijk-Scheveningen, 16-9-1941, *Creutzberg*, *Laminaria*; Scheveningen, *Vrijdag Zijnen*, *Ascophyllum nodosum* and *Polysiphonia lanosa*; *ibid.*, 18-10-1947, *Leenhouts* 132, beam; *ibid.*, 23-12-1947, *Leenhouts* 165, *Ascophyllum nodosum*; *ibid.*, 22-9-1948, *Lucas* 243, *Fucus vesiculosus*; Schouwen, 18-8-1941, *Viergever*, *Himanthalia lorea*.

*Punctaria plantaginea* (Roth) Grev. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas* 207, porous stone; Scheveningen, *Vrijdag Zijnen*, wood.

*Saccorhiza bulbosa* (Huds.) de la Pyl. — Scheveningen, 7-9-1941, *Creutzberg*, bunch of cork; Schouwen, 11-12-1949, *Viergever*, bunch of cork. Also once a bunch at Schouwen.

*Sargassum natans* (L.) Børg. — Once a bunch at Scheveningen.

*Scytosiphon lomentarius* (Lyngb.) J. Ag. — Noordwijk, 24-10-1948, *Lucas* 96, wood.

*Sphacellaria cirrhosa* (Roth) J. Ag. — Noordwijkerhout-Noordwijk, 20-9-1948, *Lucas* 127, *Chorda filum*; *ibid.*, 10-10-1948, *Lucas* 189, *Himanthalia lorea*; Noordwijk-Katwijk, 28-2-1949, *Lucas* 16, lime-stone.

#### RHODOPHYCEAE.

*Acrosorium reptans* (Crouan) Kylin — Texel, 7-10-1946, *Bloklander*, bunch of cork; Den Helder, 24-11-1948, *Swennen* 13 and *Swennen* 48, *Himanthalia lorea*; Katwijk-Scheveningen, 7-11-1948, *Lucas* 388, *Himanthalia lorea*; *ibid.*, 16-11-1948, *Lucas* 32, *Himanthalia lorea*.

*Acrosorium uncinatum* (J. Ag.) Kylin — Den Helder, 24-11-1948, *Swennen* 14, *Himanthalia lorea*; IJmuiden-Bloemendaal, 19-12-1949, *Mulder* 23, *Himanthalia lorea*; IJmuiden-Zandvoort, 28-12-1949, *Lucas* 542, *Himanthalia lorea*; Zandvoort, 1-1844, *Buse*; Noordwijkerhout-Noordwijk, 10-10-1948, *Lucas* 34, *Himanthalia lorea*; Noordwijk, 5-10-1948, *Rijkers*, *Himanthalia lorea*; Noordwijk-Katwijk, 6-12-1949, *Lucas* 527, *Himanthalia lorea*; Katwijk-Scheveningen, 7-11-1948, *Lucas* 36, *Himanthalia lorea*; *ibid.*, 16-11-1948; *Lucas* 32 and *Lucas* 33, *Himanthalia lorea*; Scheveningen, 30-11-1947, *Lucas* 265, *Himanthalia lorea*; Kijkduin-Terheiden; 21-11-1948, *Lucas* 35, *Himanthalia lorea*; Terheiden's Gravenzande, 14-11-1948, *Bloklander*, stone; Hoek van Holland, 18-12-1949, *Lucas* 536, *Himanthalia lorea*; Schouwen, 18-10-1941, *Viergever*, *Himanthalia lorea*.

*Antithamnion cruciatum* (Ag.) Näg. — Katwijk-Scheveningen, 16-11-1948, *Lucas* 54, *Himanthalia lorea*.

*Antithamnion plumula* (Ellis) Thur. — Den Helder, 24-11-1948, *Swennen* 12, *Himanthalia lorea*; *ibid.*, 26-11-1948, *den Hartog*, *Himanthalia lorea*; IJmuiden, 19-12-1949, *Mulder* 24, bunch of cork; Noordwijkerhout-Noordwijk, 20-9-1948, *Lucas* 55, cork; *ibid.*, 20-1-1949, *Lucas* 92, bunch of cork; Noordwijk-Katwijk, 5-11-1949, *Lucas* 516, *Habidrys siliquosa*; Katwijk-Scheveningen, 7-11-1949, *Lucas* 385, *Himanthalia lorea*; Terheiden's Gravenzande, 14-11-1948, *Bloklander*, *Himanthalia lorea*.



**Antithamnionella sarniensis** Lyle — A very common species. Found at Den Helder (*Swennen 18*), IJmuiden, 19-12-1949, *Mulder 6*, bunch of cork; everywhere between Zandvoort and Hoek van Holland; Schouwen; collectors *Stock (8, 9)*, *Bloklander*, *Viergever*, *Lucas (45, 50, 51, 52, 53, 273, 295, 329, 462, 481, 529)*. Found on a great number of species of algae, cork, bunches of cork and *Patella vulgata*.

**Antithamnionella sarniensis** Lyle var. **crassa** J. Lucas, nov. var. Cellular axis principalis crassis,  $\frac{3}{4}$ — $1\frac{1}{4}$  longitudinis latis, ad  $140\ \mu$  latis; ramulis unilateraliter ramosis raris.

Type: IJmuiden, 19-12-1949, *Mulder 55*, bunch of cork.

Cotypes: IJmuiden, 19-12-1949, *Mulder 56* and *57*, same bunch of cork.

All specimens with tetraspores.

**Apoglossum ruscifolium** (Turn.) J. Ag. — Noordwijk-Katwijk, 15-11-1949, *Lucas 485*, bunch of cork.

**Bangia fusco-purpurea** (Dillw.) Lyngb. — IJmuiden 19-12-1949, *Mulder 25*, bunch of cork; Zandvoort, 4-3-1949, *Mulder 3*, egg capsule of *Raja clavata*; (this species?) Noordwijk-Katwijk, 15-11-1949, *Lucas 495*, bunch of cork; Kijkduin-Terheiden, 21-11-1948, *Lucas 70*, *Ascophyllum nodosum*.

**Bostrychia scorpioides** (Gmel.) Mont. — Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas 73*, *Himanthalia lorea*.

\***Calliblepharis ciliata** (Huds.) Kütz. — Den Helder, 24-11-1948, *Swennen 17*, *Himanthalia lorea*; (this species?) Noordwijkerhout-Noordwijk, 7-12-1947, *Lucas 253*, *Patella vulgata*; Katwijk-Wassenaarse Slag, 10-12-1947, *Lucas 74*, *Patella vulgata*.

**Callithamnion byssoides** Arn. — Noordwijk-Katwijk, 15-11-1949, *Lucas 475, 507* and *508*, bunch of cork.

**Callithamnion corymbosum** (Sm.) Lyngb. — Den Helder, 24-11-1948, *Swennen 23*, *Himanthalia lorea*; (this species?) Zandvoort, XII-1841, *Buse*, *Himanthalia lorea*; Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas 75*, *ibid.*; *ibid.*, 20-1-1949, *Lucas 91*, bunch of cork; *ibid.*, 10-10-1948, *Lucas 76*, *Himanthalia lorea*; Noordwijk-Katwijk, 15-11-1948, *Lucas 474*, bunch of cork; Wassenaarse Slag-Scheveningen, 30-11-1947, *Lucas 284*, *Fucus serratus*; (this species?) Scheveningen, 13-10-1946, *Leenhouts 141*, *Himanthalia lorea*.

\***Callithamnion fruticulosum** J. Ag. — Scheveningen, 30-10-1949, *Lems*.

\***Callithamnion granulatum** (Ducluz.) Ag. — Noordwijk-Katwijk, 15-11-1949, *Lucas 473* and *501*, bunch of cork.

**Callithamnion hookeri** (Dillw.) Ag. — On *Himanthalia lorea* frequent everywhere between Zandvoort and Scheveningen (*Buse*, *Rijkers*, *Lucas 118, 119, 120, 121, 320, 327, 375, 528* and *529*); Schouwen, 23-10-1948, *Viergever*, bunch of cork. Once on *Halidrys siliquosa*.

**Callithamnion roseum** (Roth) Harv. — Terschelling, 15-8-1949, *Lucas 370*, beam; Zandvoort-Noordwijk, 26-11-1949, *Stock 10*.

**Callithamnion tetragonum** (Wither) Ag. — A very common species. Den Helder, 24-11-1948, *Swennen 26*, *Himanthalia lorea*; Wijk aan Zee, I-1844, *Buse*, *Himanthalia lorea* and *Fucus spec.*; IJmuiden, 19-12-1949, *Mulder 26*, bunch of cork; everywhere between Zandvoort and Hoek van

Holland (*Buse, Rijkers, Lacourt, Bloklander, Lucas 123, 124, 125, 126, 203, 223, 241, 255, 278, 389, 457 and 530*), *Himanthalia lorea*, *Halydris siliquosa*, *Fucus platycarpus*, *Corallina officinalis*, cork; Schouwen, 23-10-1948, *Viergever*, bunch of cork.

*Callithamnion tetragonum* (Wither) Ag.  $\beta$  *brachiatum* (Bonn.) J. Ag. — IJmuiden, 19-12-1949, *Mulder 27*, bunch of cork; Zandvoort-Noordwijk, 26-11-1949, *Stock 11*; Noordwijk-Katwijk, 15-11-1949, *Lucas 491*, bunch of cork.

\**Callithamnion* cf. *tetricum* (Dillw.) Ag. — Zandvoort-Noordwijk, 25-1-1948, *Lucas 264*, cork. In Prodr. a wrong identification is to be found. Already Van Goor found that this material of Scheveningen belongs to *C. tripinnatum*.

*Callithamnion tripinnatum* (Grat.) Ag. — Zandvoort, I-1844, *Buse*; Noordwijk-Katwijk, 14-12-1947, *Lucas 312*, *Ascophyllum nodosum*; Scheveningen, *Bisschop*.

In the present paper only a few remarks will be made about the species belonging to the difficult genus *Ceramium* Roth.

A) Species with spines.

\**Ceramium ciliatum* (Ellis) Ducluz., *Ceramium ciliatum* (Ellis) Ducluz. f. *acanthotum* Harv., \**Ceramium echionotum* J. Ag. and \**Ceramium flabelligerum* J. Ag. were found. It is doubtful whether *Ceramium acanthotum* Carm. is a good species, for sometimes parts with whorls of spines and parts with spines on the outer side of the node only are found on the same plant. Material from Den Helder has nodes, characteristic for *C. acanthotum*, but also a great number of nodes, intermediate between those of *C. ciliatum* and those of *C. acanthotum*.

B) Species without spines.

1). *Ceramium deslongchampsii* Chauv.

Syn.: *Gongroceras strictum* Kütz.; *Ceramium strictum* (Kütz.) Harv.; *Ceramium diaphanum* (Lightf.) Roth var. *strictum* (Kütz.) Feldmann-Mazoyer.

This species was only twice found on drifting objects.

The author was able to study the type of *Gongroceras strictum* Kütz.; it is a synonym of *C. deslongchampsii* Chauv. Harvey made a new combination, *Ceramium strictum* (Kütz.) Harv., which is based on the species *Gongroceras strictum* Kütz.

2) *Ceramium diaphanum* (Lightf.) Roth.

a) *C. diaphanum* (Lightf.) Roth var. *typicum* has not yet been recorded from drifting objects.

b) *C. diaphanum* (Lightf.) Roth f. *strictoides* H. Petersen.

This form is not rare on drifting objects.

The algae which thusfar were identified as *C. strictum* (Kütz.) Harv. in my opinion belong to a form of *C. diaphanum* (Lightf.) Roth. Therefore the name must be as indicated above.

c) *C. diaphanum* (Lightf.) Roth f. *tenuissimum* Lyngb.

Syn.: *Gongroceras tenuissimum* Kütz.

In the herbarium at Kützing at Leiden a label, on which is written "Original v. Lyngbye" in Kützing's handwriting, belongs to a few specimens. These specimens do not show gland cells, while also the apices

are only feebly dentate. Therefore it is not impossible that *Ceramium arachnoideum* J. Ag. is a synonym of *C. tenuissimum* (Lyngb.) J. Ag. According to Kylin *Ceramium arachnoideum* J. Ag. is not essential different from *C. diaphanum* (Lightf.) Roth f. *strictoides* H. Petersen. The same applies to *C. tenuissimum* (Lyngb.) J. Ag. The intermediate forms between *C. diaphanum* (Lightf.) Roth f. *strictoides* H. Petersen and *C. tenuissimum* (Lyngb.) J. Ag. which have been found by me, are in accordance with this opinion. This form is not rare on drifting objects.

d) *C. diaphanum* (Lightf.) Roth f. *cateniforme* (Kütz.) J. Lucas, nov. comb.

Syn.: *Hormoceras cateniforme* Kütz.

The lowest part of the type of this form, preserved at the Rijks-herbarium, Leiden, shows nodes with upward proliferation of the corticating cells. However, no internode is completely corticated. For the rest there are no differences with *C. diaphanum* (Lightf.) Roth. *Hormoceras cateniforme* has to be considered as a form of *C. diaphanum* (Lightf.) Roth. The form is not rare on drifting objects.

e) *C. diaphanum* (Lightf.) Roth. f. *corticatum* (Kylin) Sjöstedt.

In connection to the above mentioned remark (d), and in connection to the fact, that the form also occurs on drifting objects, I agree with Sjöstedt and consider *C. corticatum* Kylin as a form of *C. diaphanum* (Lightf.) Roth. *Gongroceras tenuicorne* Kütz. is not identical with *C. corticatum* Kylin, as Kylin supposed. The greater part of Kützing's material belongs to *C. diaphanum* (Lightf.) Roth f. *tenuissimum* Lyngb.; one specimen, however, which agrees with the figure in Kützing's *Tabulae Phycologicae* and must be considered the type, differs from the other specimens, and possibly belongs to a separate species.

3) \**Ceramium rescissum* Kylin and *Ceramium rubrum* (Huds.) Ag. are known from drifting objects too.

4) A number of specimens, belonging to *Ceramium*, could not be identified with certainty as yet.

*Chantransia daviesii* (Dillw.) Thur. — Bloemendaal, 13-11-1949, *Stock (12)* and *Hazevoet*, cork; Noordwijk, 20-9-1949, *Lucas 56*, bunch of cork; Scheveningen (Prodr.).

*Chantransia virgatula* (Harv.) Thur. — Zandvoort, 4-3-1949, *Mulder 4*, *Ceramium rubrum*.

\**Chondria dasyphylla* (Woodw.) Ag. — IJmuiden, 19-12-1949, *Mulder 28*, bunch of cork; on 20—22-IX-1948 in a great number on many kinds of substrata, everywhere between Noordwijkerhout and Kijkduin, *Lucas 127*, *131*, *133*; Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 132*, *Ascophyllum nodosum*.

\**Chondria tenuissima* (G. et W.) Ag. — IJmuiden, 19-12-1949 *Mulder 29*, bunch of cork; Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 134*, lime, cork, *Himanthalia lorea* and *Ascophyllum nodosum*; Noordwijk-Katwijk, 14-12-1947, *Lucas 326*, *Himanthalia lorea*; *ibid.*, 15-11-1949, *Lucas 459*, cork; *ibid.*, 15-11-1949, *Lucas 480*, bunch of cork; Katwijk-Scheveningen, 16-11-1948, *Lucas 135*, *Himanthalia lorea*.

*Chondrus crispus* (L.) Stackh. — (this species?) Zandvoort, 1840, *Buse*, *Himanthalia lorea*; Noordwijkerhout-Noordwijk, 7-12-1947, *Lucas 136*,

*Patella vulgata*; Noordwijk-Katwijk, 15-11-1949, *Lucas 458*, cork; Scheveningen, 1-10-1948, *Bloklander*, *Patella vulgata*; Schouwen, VIII-1946, *Bloklander*, *Himanthalia lorea*.

\**Corallina* cf. *granifera* Ell. et Sol. — Noordwijk, 13-11-1949, *Lucas 456*, egg capsule of *Raja clavata*.

*Corallina officinalis* L. A common species, especially on *Himanthalia lorea*. Terschelling, VIII-1949, *Lucas 355*; Den Helder 24-11-1948, *Swennen 12*; everywhere between IJmuiden and Hoek van Holland (*Mulder 5* and *35*, *Rijkers*, *Bloklander*, *Lucas 153*, *280*, *312*, *318*, *355*, *374*, *539*, *546*); Schouwen, *Viergever*.

*Corallina rubens* L. — IJmuiden-Zandvoort, 28-12-1949, *Lucas 543*, *Himanthalia lorea*; Noordwijkerhout-Noordwijk, 10-10-1948, *Lucas 154*, *ibid.*; Katwijk-Scheveningen, 21-9-1948, *Lucas 155*, *Chorda filum*.

*Corallina squamata* Ell. et Sol. — Noordwijkerhout-Noordwijk, 7-12-1947, *Lucas 156*, *Patella vulgata*; Scheveningen, XII-1843, *van den Capelle*, *Himanthalia lorea*.

\**Cordylecladia erecta* (Grev.) J. Ag. — Scheveningen, 31-10-1948, *Sprong*, *Himanthalia lorea*.

\**Cryptopleura ramosa* (Batt.) Kylin — Den Helder, 24-11-1948, *Swennen 13*, *Himanthalia lorea*; Noordwijk, 5-10-1948, *Rijkers*, *Himanthalia lorea*; Noordwijk-Katwijk, 15-11-1949, *Lucas 505*, bunch of cork; Terheiden's Gravenzande, 14-11-1948, *Bloklander*, *Himanthalia lorea*.

\**Cruoriella dubyi* (Crouan) Schmitz — Scheveningen, 13-10-1946, *Leenhouts*, *Himanthalia lorea*.

*Cystoclonium purpurascens* (Huds.) Kütz. — Den Helder, 26-11-1948, *den Hartog*, *Himanthalia lorea*; IJmuiden-Bloemendaal, 19-12-1949, *Mulder 58*, *Himanthalia lorea*; Noordwijkerhout-Noordwijk, 11-11-1948, *Lucas 161*, *ibid.*; *ibid.*, 5-11-1948, *Lucas 328*, *ibid.*; Katwijk-Scheveningen, 16-11-1948, *Lucas 159*, *ibid.*; Kijkduin Terheiden, 21-11-1948; *Lucas 160*, *ibid.*; Terheiden's Gravenzande, 14-11-1948, *Bloklander*, *ibid.*

\**Dasya arbuscula* Ag. — IJmuiden, 19-12-1949, *Mulder 30*, *31* and *32*, bunch of cork.

\**Dasya ocellata* (Grateloup) Harv. — Noordwijk-Katwijk, 15-11-1949, *Lucas 470*, bunch of cork.

*Dasya pedicellata* (Ag.) Ag. — Zandvoort. In the Rijksherbarium at Leiden material from Venice from Agardh is not to be found, though van Goor mentioned this material. Only some plants of *Dasya*, on *Himanthalia lorea*, on a piece of mica and on a piece of glass have been preserved. According to the label, on which is written "supra varias algas", all this material did belong to Buse; van Goor, however, stated that no material from Buse was present. It is dated I-1844.

*Dumontia filiformis* (Fl. Dan.) Grev. — Noordwijkerhout-Noordwijk, 10-10-1948, *Lucas 163*, *Himanthalia lorea*.

\*c.f. *Erythropeltis discigera* (Berthold) Schmitz — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas 194*, *Nitophyllum punctatum*; Schouwen, X-1942, *Viergever*, *Laomedea spec.*

\**Falkenbergia hillebrandii* (Born.) Falkenb. — A common species; especially on *Himanthalia*. Den Helder, *Swennen 25*, *den Hartog*; IJmuiden, 19-12-1949, *Mulder 33*, bunch of cork; IJmuiden-Zandvoort, 19-12-1949,

Mulder 34, *Gastroclonium ovale*; Zandvoort, Mulder 6; everywhere between Noordwijkerhout and Hoek van Holland, IX—XII, 1947—1949, *Rijkers*, *Bloklander* and *Lucas* 102, 103, 104, 105, 106, 460, 468, 532, 533.

\**Gastroclonium clavatum* (Roth) Ardiss. — Noordwijk, 24-10-1948, *Lucas* 141, cork.

*Gastroclonium kaliforme* (G. et W.) Ardiss. — Den Helder, 24-11-1948, *Swennen* 27, *Himanthalia lorea*; IJmuiden-Bloemendaal, 19-12-1949, *Mulder* 35, *Himanthalia lorea*; Zandvoort, I-1844, *Buse*, cork and *Cystoseira fibrosa*; Zandvoort-Noordwijk, 26-11-1949, *Stock* 13, cork; Noordwijkerhout-Noordwijk, 20-9-1948, 10-10-1948, 24-10-1948, 5-11-1948, 11-11-1948, *Lucas* 13, 142, 143, 144, 234, on *Himanthalia lorea*, *Chorda filum* and cork; Scheveningen, 19-9-1946, *Leenhouts*, bunch of cork.

*Gastroclonium ovale* (Huds.) Kütz. — A common species, especially on *Himanthalia lorea*. Terschelling, 15-8-1949, *Lucas* 356; Den Helder, 24-11-1948, *Swennen* 38; everywhere between Wijk aan Zee and Hoek van Holland; Schouwen, 18-8-1941, *Viergever*.

\**Gelidium attenuatum* (Turn.) Thur. — Noordwijk-Katwijk, 14-12-1947, *Lucas* 178, *Patella vulgata*.

*Gonotrichum elegans* (Chauv.) Zanard. — Noordwijkerhout-Noordwijk, 20-9-1948, *Lucas* 180, *Chorda filum*; Noordwijk-Katwijk, 15-11-1949, *Lucas* 507, bunch of cork; Wassenaarse Slag-Scheveningen, 30-11-1947, *Lucas* 290, *Ascophyllum nodosum*; Scheveningen, 23-12-1947, *Leenhouts* 168, cork.

*Gracilaria confervoides* (L.) Grev. — Noordwijk, 8-5-1949, *Lucas* 335, clump of *Buccinum* eggs.

\**Grateloupia filicina* (Wulf.) Ag. — Scheveningen, 31-10-1948, *Sprong*, *Himanthalia lorea*. The record from Scheveningen (Prodr. and later cited by van Goor) was a mistake. The specimen, according to the cross-section, belongs to *Cystoclonium purpurascens*.

*Griffithsia* cf. *barbata* (Sm.) Ag. — Noordwijk, 13-11-1949, *Lucas* 453, egg capsule of *Raja clavata*; Noordwijk-Katwijk, 15-11-1949, *Lucas* 524, egg capsule of *Raja clavata*.

\**Griffithsia setacea* (Ellis) Ag. — Katwijk-Scheveningen, 7-11-1948, *Lucas* 181, *Himanthalia lorea*; Kijkduin-Terheiden, 21-11-1949, *Lucas* 38, *Himanthalia lorea*.

\**Haematocelis rubens* J. Ag. — Katwijk-Scheveningen, 16-11-1948, *Lucas* 182, *Himanthalia lorea*.

\**Halurus equisetifolius* (Lightf.) Kütz. — Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas* 186, *Himanthalia lorea*.

*Heterosiphonia coccinea* (Ellis) Batt. — Den Helder, 24-11-1948, *Swennen* 39, *Himanthalia lorea*; Zandvoort, I-1844, *Buse*; Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas* 205, *Himanthalia lorea*; *ibid.*, 5-11-1948, *Lucas* 333; *ibid.*, 20-1-1949, *Lucas* 93, bunch of cork; Wassenaarse Slag-Scheveningen, 30-11-1947, *Lucas* 270, *Himanthalia lorea*; Scheveningen-Hoek van Holland, 18-12-1949, *Lucas* 533, *Himanthalia lorea*; Kijkduin, 18-12-1949, *Ascophyllum nodosum*.

*Hypoglossum woodwardii* Kütz. — Common. Everywhere between Wijk aan Zee and 's Gravenzand; *Buse*, *Vrijdag Zijnen*, *Mulder* 7, *Bloklander*, *Lucas* 183, 184, 185, 212, 292, 362, 386, 486, 531, 541; most on *Himanthalia lorea*.

\**Laurencia* cf. *caespitosa* Lamour. — Noordwijk-Katwijk, 15-11-1949, *Lucas* 463, cork.

\**Laurencia* cf. *obtusa* (Huds.) Lamour. — Noordwijkerhout-Noordwijk, 20-9-1948, *Lucas* 23, *Himanthalia lorea*.

*Laurencia pinnatifida* (Gmel.) Lamour. — Very common. Terschelling. Den Helder, everywhere between IJmuiden and 's Gravenzande, Schouwen. Most on *Himanthalia lorea*.

\**Lithothamnion calcareum* (Pallas) Aresch. — Terschelling, 16-8-1940, *Geelhoed*, clump of *Buccinum* eggs; *ibid.*, 23-7-1947, *van Haren*, *ibid.*

*Lithothamnion lenormandii* (Aresch.) Foslie — Noordwijk-Katwijk, 28-2-1949, *Lucas* 14, lime-stone; Katwijk, 15-10-1938, *Lacourt*, bunch of cork.

*Lomentaria articula* (Huds.) Lyngb. — Zandvoort, XII-1841, *Buse*, *Himanthalia lorea*; *ibid.*, I-1844, *Buse*, *Himanthalia lorea* and cork; (this species?) Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas* 235, *Himanthalia lorea*.

*Melobesia lejolissii* Rosan. — Zandvoort, I-1844, *Buse*, *Himanthalia lorea*; Wassenaarse Slag-Scheveningen, 21-9-1948, *Lucas* 236, *Chondria dasyphylla*. Probably not uncommon; most colonies are very young.

\**Melobesia zonalis* (Crouan) Foslie — IJmuiden-Bloemendaal, 19-12-1949, *Mulder* 8, *Himanthalia lorea*; Noordwijk, 5-10-1948, *Rijkers*, *Himanthalia lorea*; Noordwijk-Katwijk, 15-11-1949, *Lucas* 509, bunch of cork.

*Membranoptera alata* (Huds.) Stackh. — Katwijk (Prodr.)

*Neomonospora pedicellata* (Sm.) G. Feldm. et Meslin — Syn. *Monospora pedicellata* (Sm.) Sol. — Katwijk-Scheveningen, 16-11-1948, *Lucas* 238, *Himanthalia lorea*; Scheveningen, 30-11-1947, *Lucas* 276, *Himanthalia lorea*; (this species?) Scheveningen-Hoek van Holland, 18-12-1949, *Lucas* 538, *Himanthalia lorea*.

\**Nitophyllum punctatum* (Stackh.) Grev. — IJmuiden-Bloemendaal, 19-12-1949, *Mulder* 9; *Himanthalia lorea*; Zandvoort, I-1844, *Buse*, *Halidrys siliquosa*; Noordwijkerhout-Noordwijk, 24-10-1948, *Lucas* 194, *Himanthalia lorea*; *ibid.*, 5-11-1948, *Lucas* 225, *Himanthalia lorea*; Katwijk-Scheveningen, 7-11-1948, *Lucas* 387, *Himanthalia lorea*; Hoek van Holland, 18-12-1949, *Lucas* 535, *Himanthalia lorea*.

\**Peyssonnelia atropurpurea* Crouan — IJmuiden-Bloemendaal, 19-12-1949, *Mulder* 10, *Himanthalia lorea*; Terheiden-'s Gravenzande, 14-11-1948, *Bloklander*, *Himanthalia lorea*.

\**Peyssonnelia rubra* (Grev.) J. Ag. — Den Helder, 24-11-1948, *Swennen* 46, *Himanthalia lorea*; Katwijk-Scheveningen, 7-11-1948, *Lucas* 376, *Himanthalia lorea*.

\**Phyllophora membranifolia* (G. et W.) J. Ag. — Noordwijkerhout-Noordwijk, 10-10-1948, *Lucas* 239, *Himanthalia lorea*; *ibid.*, 24-10-1948, *Lucas* 240, *Himanthalia lorea*.

cf. *Pleonosporium borneri* (Sm.) Näg. — Zandvoort, I-1844, *Buse*, *Halidrys siliquosa*; Noordwijk, 8-5-1949, *Lucas* 303, beam; Katwijk-Scheveningen, 8/9-2-1949, *Lucas* 307, *Polysiphonia lanosa*.

*Plocamium coccineum* (Huds.) Lyngb. — Zandvoort, I-1844, *Buse*, *Halidrys siliquosa*; Zandvoort-Katwijk, 11-3-1949, *Lucas* 322, egg capsule of *Raja clavata*; Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas* 231, *Himanthalia lorea*; Noordwijk, 8-5-1949, *Lucas* 300, clump of *Buccinum* eggs;

ibid., 13-11-1949, *Lucas 445*, egg capsule of *Raja clavata*; Noordwijk-Katwijk, 15-11-1949, *Lucas 526*, ibid.; Katwijk-Scheveningen, 7-11-1948, *Lucas 229*, *Himanthalia lorea*; ibid., 16-11-1948, *Lucas 230*, *Himanthalia lorea*; Scheveningen, *Bisschop*; Kijkduin-Hoek van Holland, 4-12-1946, *van Haren*, egg capsule of *Raja clavata*.

\**Polysiphonia brodiaei* (Dillw.) Grev. — Texel, 7-10-1946, *Bloklander*, bunch of cork; Noordwijkerhout-Noordwijk, 10-10-1948, *Lucas 99*, *Himanthalia lorea*; Noordwijk-Katwijk, 15-11-1949, *Lucas 478*, *490* and *506*, bunch of cork; Scheveningen, 19-9-1946, *Leenhouts 140*, bunch of cork.

*Polysiphonia denudata* (Dillw.) Kütz. — IJmuiden, 19-12-1949, *Mulder 11*, bunch of cork; Zandvoort-Noordwijk, 26-11-1949, *Stock 14*, bunch of cork; Noordwijkerhout-Noordwijk, 10-10-1948, *Lucas 101*, *Himanthalia lorea*; ibid., 20-1-1949, *Lucas 3*, cork; Noordwijk-Katwijk, 15-11-1949, *Lucas 476*, bunch of cork.

*Polysiphonia elongata* (Huds.) Harv. — Scheveningen, 19-10-1946, *Leenhouts 144*, bunch of cork.

\**Polysiphonia cf. elongella* Harv. — Zandvoort-Noordwijk, 26-11-1949, *Stock 15*, cork.

*Polysiphonia lanosa* (L.) Tandy — Very common. Terschelling, Texel, Den Helder, everywhere between IJmuiden and Hoek van Holland. Always on *Ascophyllum nodosum*.

*Polysiphonia nigra* (Huds.) Batt. — IJmuiden, 19-12-1949, *Mulder 12*, bunch of cork; Scheveningen, 23-12-1947, *Leenhouts 170*, cork.

*Polysiphonia nigrescens* (Dillw.) Grev. — Texel, 7-10-1946, *Bloklander*, bunch of cork; Noordwijk-Katwijk, 15-11-1949, *Lucas 522*, egg capsule of *Raja clavata*; Scheveningen, 23-12-1947, *Leenhouts 167*, cork.

*Polysiphonia urceolata* (Lightf.) Grev. — IJmuiden, 19-12-1949, *Mulder 13*, bunch of cork; Scheveningen, 23-12-1947, *Leenhouts 169*, bunch of cork; Terheiden, 19-1-1948, *Lensink*, wood.

*Polysiphonia violacea* (Roth) Grev. — Texel, 7-10-1946, *Bloklander*, bunch of cork; Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas 100*, cork; Noordwijk-Katwijk, 15-11-1949, *Lucas 469*, bunch of cork.

*Porphyra laciniata* (L.) J. Ag. — Zandvoort, 1-1844, *Buse*, *Chorda filum*; Noordwijkerhout-Noordwijk, 20-1-1949, *Lucas 94*, bunch of cork; Noordwijk-Katwijk, 15-11-1949, *Lucas 519*, branch; Scheveningen, *Vrijdag Zijnen*, ship's mast.

*Ptilota plumosa* (L.) Ag. — Friesland (Prodr.); Zandvoort (van Goor).

\**Ptilothamnion pluma* (Dillw.) Thur. — Den Helder, 24-11-1948, *Swennen 15*, *Himanthalia lorea*.

\**Rhodochorton membranaceum* Magn. — Several times there has been found a small red alga within the hydrothecae of *Laomedea geniculata* (*Hydrozoa*) which probably belongs to this species.

*Rhodochorton rothii* (Lyngb.) Näg. — Noordwijk, 8-5-1949, *Lucas 305*, beam; Noordwijk-Katwijk, 15-11-1949, *Lucas 510*, bunch of cork; ibid., 6-12-1949, *Lucas 532*, *Himanthalia lorea*; Scheveningen, *Vrijdag Zijnen*, *Himanthalia lorea*.

*Rhodomela lycopodioides* (L.) J. Ag. — Den Helder, 24-11-1948, *Swennen 41*, *Himanthalia lorea*; Noordwijkerhout-Noordwijk, 5-11-1948, *Lucas 206*, *Himanthalia lorea*; Noordwijk, 5-10-1948, *Rijkers*, *Himanthalia*

*lorea*; Kijkduin-Terheiden, 21-11-1948, *Lucas 39*, *Himanthalia lorea*.

As far as I can judge from the material in the Rijksherbarium, Leiden, there is no difference between *R. subfusca* (Woodw.) Ag. and *R. lycopo-dioides*.

*Rhodophyllis bifida* (G. et W.) Kütz. — The record from Zandvoort (Prodr. and later cited by van Goor) was based on a wrong identification. The specimen concerned belongs to *Acrosorium uncinatum*.

*Rhodymenia palmata* (L.) Grev. — Zandvoort (Prodr.).

\**Seirospora gaillionii* (Crouan) de Toni — IJmuiden, 19-12-1949, *Mulder 14*, bunch of cork.

*Spermothamnion turneri* (Mert.) Aresch. — Kijkduin, 18-12-1949, *Lucas 531*, *Ascophyllum nodosum*.

\**Spyridia filamentosa* (Wulf.) Harv. — IJmuiden, 19-12-1949, *Mulder 15*, bunch of cork.

\**Trailliella intricata* (J. Ag.) Batt. — Kijkduin-Terheiden, 21-11-1948, *Lucas 37*, *Himanthalia lorea*.

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