D. Russell - ALAE - IDS
GH BALAZS FILES
1970s - 1990s PART 3 of 24

George,

Thank you for the note and the card with Hypnea musciformis on it. It is included with this letter. The other sample is also H. musciformis, and the really great thing would be to find it on Lanai, Kaui, etc. I think I told you it was very very abundant on the beaches, in the drift, by Lahaina. I think the most important information about this species, now, would be here it is located and the date.

The only additional thing that could go in the sample data would be the blue string found in sample 3. I didn't find anything unusual besides that. You note that we have not found H. musciformis at Kawela, but it was in sample 1. I found one distinct hook from this species. Most of these algae are shallow water species and the Botryocladia skottsbergii usually grows under rock overhangs or in caves. This is where we also find Amansia.

Aloha,

Dennis

School of Natural & Mathematical Sciences

Seattle Pacific University
Seattle, Washington 98119
Phone: (206) 281-2140

George Balazs
National Marine Fisheries Service F/SWC2
P.O. Box 3830
Honolulu, Hawaii 96812

Dear George,

Here is a list of the algae from the last three samples:

Sample 1, Kawela Bay, 3-29-84x 1985

Acanthophora spicifera	Trace
Amansia glomerata	3%
Codium edule	Trace
Hypnea musciformis	Trace
Laurencia cartilaginea	Trace
Martensia fragilis	1%
Pterocladia capillacea	20%
Turbinaria ornata	5%
Ulva reticulata	70%

Black colonia ascidians (?)

Sample 2, Kawela Bay, 3-29-1985

Acanthophora spicifera	Trace
Amansia glomerata	1%
Botryocladia skottsbergii	Trace
Cladophoropsis gracillum	Trace
Codium arabicum	Trace
Codium edule	Trace
Griffithsia tenuis	Trace
Leveillia jungermannioides	Trace
Pterocladia capillacea	24%
Sargassum polyphyllum	Trace
Turbinaria ornata	Trace
Ulava reticulata	75%

Black colonial ascidians (?)

Sample 3, Kawela Bay, 3-29-1985

Acanthophora spicifera	Trace
Amansia glomerata	Trace
Codium arabicum	Trace
Gelidiopsis variable	Trace
Griffithsia tenuis	Trace
Martensia fragilis	Trace
Pterocladia capillacea	18%
Turbinaria ornata	1%
Ulava reticulata	80%

Alphabetical listing:

Chlorophyta
Cladophoropsis gracillum Dawson
Codium arabicum Kutzing
Codium edule Silva
Ulva reticulata Forsskal

Rhodophyta
Acanthophora spicifera (Vahl) Boerg.
Amansia glomerata C. Ag.
Botryocladia skottsbergii (Boerg.) Levr.
Griffithsia tenuis C. Ag.
Hypnea musciformis (Wulfen) C. Ag.
Laurencia cartilaginea Yamada
Leveillea jungermannioides Harv.
Martensia fragilis Harv.
Pterodladia capillacea (Gmelin) Bornet
Gelidiopsis variable J. Ag.

Phaeophyta
Sargassum polyphyllum J. Ag.
Turbinaria ornata J. Ag.

CHLOROPHYTA SPECIES AND AUTHORS
PLUS SEAGRASSES
MASTER LIST OF ALL ALGAE IDENTIFIED TO DATE
(August 15, 1985)

Avrainvillea lacerata J. Ag.
Bryopsis hypnoides Lamx.
Bryopsis pennata Lamx.
Bryopsis pennata var. secunda (Harvey) Collins and Harvey
Bryopsis plumosa (Hudson) C. Ag.
Caulerpa lentillifera J. Ag.
Caulerpa racemosa (Forsskal) J. Ag.
Caulerpa racemosa var. peltata (Lam.) Eubank
Caulerpa racemosa var. macrophysa (Kutzing) Taylor
Caulerpa racemosa var. turbinata (J. Ag.) Eubank
Caulerpa racemosa var. uvifera (Turner) Weber van Bosse
Caulerpa serrulata (Forsskal) J. Ag.
Caulerpa sertularioides (Gmelin) Howe
Caulerpa taxifolia (Vahl) C. Ag.
Caulerpa urvilliana Montagne
Caulerpa webbiana Mont.
Caulerpa webbiana var. disticha Weber van Bosse
Chaetomorpha sp.
Chlorella sp.
Chlorodesmis hildebrandtii A. & E. S. Gepp
Cladophora fascicularis (Mertens) Kützing
Cladophora socialis Kützing
Cladophora socialis var. hawaiiana Brand.
Cladophora trichotoma (Ag.) Kützing
Cladophora sp.
Cladophoropsis gracillum Dawson
Cladophoropsis luxurians Gilbert
Codium arabicum Kützing
Codium caneatum Setchell and Gardner
Codium edule Silva
Codium phasmaticum Setchell
Codium reediae Silva
Codium sp.
Derbesia fastigiata Taylor
Derbesia marina (Lyngb.) Sol.
Dictyosphaeria cavernosa (Forsskal) Boerg.
Dictyosphaeria versluysii Weber van Bosse
Enteromorpha clathrata (Roth) Grev.
Enteromorpha clathrata var. crinita (Roth) Hauck
Enteromorpha tubulosa Kützing
Enteromorpha sp.
Halicystis sp.
Halimeda discoidea Decaisne
Halimeda micronesica Yamada
Halimeda opuntia (L) Lamouroux
Halimeda sp.
Microdictyon japonicum Setchell
Microdictyon montagnei Harvey
Microdictyon setchellianum Howe
Monostroma oxyspermum (Kütz.) Doty

Monostroma sp.
Pilinia rimosa Kützing
Pilina sp. nov.
Pseudobryopsis oahuensis Egerod
Rhizoclonium hookeri Kützing
Siphonocladus tropicus (Crouan) J. Ag.
Ulothrix sp.
Ulva fasciata Delile
Ulva reticulata Forsskal
Ulva rigida C. Ag.
Ulva sp.
Urospora sp. nov.
Valonia aegagropila C. Ag.
Valonia ventricosa J. Ag.
Valonia sp.

SEAGRASSES, ETC.

Halophila ovalis (R. Br.) Hook
Halophila beccarii Ascherson

TERRESTRIAL PLANTS

Casurina equisetifolia L.

PHAEOPHYTA SPECIES AND AUTHORS
MASTER LIST OF ALL ALGAE IDENTIFIED TO DATE
(August 15, 1985)

Chnoospora implexa J. Ag.
Chnoospora sp.
Colpomenia sinuosa (Roth) Derbes and Solier
Dictyopteris plagiogramme (Mont.) Vickers
Dictyota acuteloba J. Ag.
Dictyota crenulata J. Ag.
Dictyota divaricata Lamouroux
Dictyota friabilis Setchell
Dictyota stolonifera Dawson
Dictyota sp.
Ectocarpus breviarticulatus J. Ag.
Ectocarpus indicus Sonder
Ectocarpus padinae (Buffham) Savageau
Hydroclathrus clathratus (C. Ag.) Howe
Lobophora variegata (Lamx.) Womersley
Padina japonica Yamada
Ralfsia occidentalis Hollenberg
Rosenvingea intricata (J. Ag.) Boerg.
Rosenvingea orientalis (J. Ag.) Boerg.
Sargassum echinocarpum J. Ag.
Sargassum polyphyllum J. Ag.
Sphacelaria furcigera Kűtzing
Sphacelaria novae-hollandiae G. Sonder
Sphacelaria tribuloides Meneghini
Sphacelaria sp.
Turbinaria ornata (Turn.) J. Ag.
Zonaria variegata (Lamoureux) C. Ag.
Zonaria hawaiiensis (Lamoureux) C. Ag.
Zonaria sp.

RHODOPHYTA SPECIES AND AUTHORS
MASTER LIST OF ALL ALGAE IDENTIFIED TO DATE
(August 15, 1985)

Acanthophora spicifera (Vahl) Boerg.
Acrochaetium gracile Boerg.
Acrochaetium sp.
Actinotrichia fragilis (Forsk.) Boerg.
Ahnfeltia concinna J. Ag.
Amansia glomerata C. Ag.
Amphiroa anastomosans Weber van Bosse
Amphiroa fragilissima (L.) Lamx.
Asparagopsis taxiformis (Delile) Coll. and Harvey
Botryocladia skottsbergii (Boerg.) Levr.
Callithamnion byssoides Arnott
Centroceros clavulatum (C. Ag.) Montagne
Ceramium fimbriatum Set. and Gardner
Ceramium leutzelburgii Schmidt
Ceramium tenuissimum (Lyngbye) J. Ag.
Ceramium sp.
Champia parvula (C. Ag.) Harvey
Chondria tenuissima (Good. and Wood) C. Ag.
Chondria sp.
Chondrococcus hornemanni (Mert.) Schmitz
Chrysymenia glebosa Abbott and Litter
Cladhymenia pacifica Setchell
Coelothrix irregularis (Harv.) Boerg.
Corallina sandvicensis Lemm.
Corallina sp.
Dasya pedicellata (C. Ag.) C. Ag.
Dicranema rosaliae Setchell and Gardner
Falkenbergia rufolanosa Harvey
Falkenbergia sp.
Fosliella farinosa (Lamx.) Howe
Galaxaura cylindrica (Ellis and Solander) Lam.
Galaxaura fasciculata Kjellman
Gelidiella acerosa (Forsskal) Feldmann and Hamel
Gelidiella adnata Dawson
Gelidiella machrisiana
Gelidiella myrocladia (Boerg.) Feldmann
Gelidiella setacea (Feldmann) Feldmann and Hamel
Gelidiella sp.
Gelidiopsis variabile J. Ag.
Gelidium adnata Dawson
Gelidium crinale (Turner) Lamour.
Gelidium pluma Loomis
Gelidium pusillum (Stackhouse) LaJolis
Gelidium reediae Loomis
Gelidium sp.
Gracilaria bursapastoris (Gmel.) Silva
Gracilaria coronopifolia J. Ag.
Gracilaria filicina (Wulfen) C. Ag.
Gracelaria sp.
Grateloupia filicina (Wulfen) C. Ag.
Grateloupia hawaiiana Dawson
Griffithsia ovalis Harvey

Griffithsia rhizophora Grunow
Griffithsia tenuis C. Ag.
Griffithsia sp.
Haloplegma duperryi Mont.
Helminthocladia rhizoidea Doty and Abbott
Herposiphonia nuda Hollenberg
Herposiphonia parca Setchell
Herposiphonia variabilis Hollenberg
Heteroderma subtilissima (Foslie) Foslie
Hypnea cervicornis J. Ag.
Hypnea chordaceae J. Ag.
Hypnea esperi Bory
Hypnea musciformis (Wulfen) C. Ag.
Hypnea nidifica J. Ag.
Hypnea pannosa J. Ag.
Hypnea spinella (J. Ag.) Kutzing
Hypnea sp.
Hypneocolax stellaris J. Ag.
Jania capillacea Harvey
Jania micrarthrodia Lamx.
Jania ungulata Yendo
Laurencia cartilaginea Yamada
Laurencia carolinensis Saito
Laurencia decumbens Kutzing
Laurencia galtstoffi Howe
Laurencia majuscula (Harv.) Lucas
Laurencia mariannensis Yamada
Laurencia nidifica J. Ag.
Laurencia obtusa (Huds.) Lam.
Laurencia subsimplex Tseng
Laurencia tenera Tseng
Laurencia ungulata Yamada
Laurencia sp.
Leveillea jungermannioides Harv.
Liagora maxima Butters
Liagora papenfussii Abbott
Liagora sp.
Martensia fragilis Harvey
Melobesia sp.
Nemalion sp.
Peysonellia sp.
Plocamium brasiliense (Greville) Howe and Taylor
Plocamium sandvicense J. Ag.
Plocamium sp.
Polysiphonia dotyi Hollenberg
Polysiphonia howei Hollenberg
Polysiphonia poko Hollenberg
Polysiphonia pseudovillum Hollenberg
Polysiphonia saccorhiza (Collins and Hervey) Hollenberg
Polysiphonia scropulorum Harvey
Polysiphonia setacea Hollenberg
Polysiphonia sparsa (Setchell) Hollenberg
Polysiphonia sphaerocarpa Boerg.
Polysiphonia tsudana Hollenberg
Polysiphonia sp.

Porolithon gardineri (Foslie) Foslie
Porolithon sp.
Pterocladia caerulescens
Pterocladia calaglossoides (Howe) Dawson
Pterocladia capillacea (Gmelin) Bornet
Pterocladia sp.
Rhodymenia anastomosans Weber van Bosse
Spyridia filamentosa (Wulfen) Harvey
Tolypiocladia calodictyon (Harv.) Silva
Trailliella sp.
Trichogloea lubrica (Harv.) Butters
Wurdemannia miniata (Lamark and DeCandelle) Feldmann and Hamel
Wurdemannia sp.

CYANOPHYTA SPECIES AND AUTHORS
MASTER LIST OF ALL ALGAE IDENTIFIED TO DATE
(August 15, 1985)

Anabaena constricta (Szafer) Geitler
Anabaena variabilis Kutzing
Calothrix sp.
Dermocarpa sphaerica Setchell and Gardner
Lyngbya cinerescens Kutzing
Lyngbya lagerheimii (Mobius) Gomont
Lyngbya majuscula Gomont
Lyngbya porphyrosiphonis Fremy
Lyngbya semiplena (C. Ag.) J. Ag.
Lyngbya sp.
Microcoleus acutissimus Gardner
Microcoleus sp.
Microcystis sp.
Oscillatoria subtilissima Kutz.
Oscillatoria sp.
Rivularia sp.
Schizonema pascheri Bharadwaja
Schizothrix calcicola (Ag.) Gomont

DIATOMS SPECIES AND AUTHORS
MASTER LIST OF ALL ALGAE IDENTIFIED TO DATE
(August 15, 1985)

Asterionella notata (Grűn.) Van Heurck
Climacosphenia sp.
Cocconeis sp.
Cocconeis sp.
Licmophora sp.
Mastogloea sp.
Navicula sp.
Pyxidicula sp.
Synedra sp.

- Results of PH 1983 & 1984
- LAYSAN
- Miscellaneous mortalities

School of Natural & Mathematical Sciences

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Phone: (206) 281-2140

George Balazs
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96722

28 December 1984

Dear George,

These are the results of the latest identifications:

Sample No. 20

Caulerpa racemosa (Forsskal) J. Ag.

Sample No. 23

Caulerpa racemosa (with globular ramulae)
Bryopsis pennata var. secunda (Harvey) Coll. and Harv.

Sample No. 01 1984

Codium arabicum Kutzing

Sample No. 05

Dictyosphaeria cavernosa (90%)
Laurencia nidifica (10%)

Sample No. 07

Laurencia nidifica J. Ag. (90%)
Dictyospheria cavernosa (10%)

Sample No. 12

Dictyospheria versluysii Weber van Bosse

Sample No. 13

Centroceros clavulatum (C. Ag.) Montagne
Polysiphonia poko Hollenberg (trace)
Cladophora sp. (trace)
Laurencia majuscula Harv. Lucas (50%)
Caulerpa webbiana Mont. (95%)
Microcoleus acutissimus Gardner
Lyngbya sp.

Sample 16

Dictyosphaeria cavernosa (99%)
Lyngbya sp. (trace)
Wurdemannia miniata (Lamour.) Feldmann and Hamel (trace)

Sample No. 18

Centroceros clavulatum (trace)
Dictyosphaeria cavernosa (trace)
Hypnea pannosa J. Ag. (trace)
Polysiphonia sp. (trace)
Laurencia undulata Yamada (99%)
Gelidium pusillum (Stackhouse) Le Jolis

Sample No. CCL-45.5, Maui, No. 2, July 84

Pterocladia capillacea (Gmelin) Bornet (90%)
Stone, sand-conglomerates which are not algae (10%)
Sponge (10%)

Sample No. CCL-45.5, Maui, No. 1, July 1984

Sponge (90%)
Gelidium pusillum (10%)

Sample No. PH 1983-1, Mouth

Jania capillacea Harvey (trace)
Laurencia undulata Yamada (90%)

Waikiki Aquarium shell scraping, Hawksbill, 10-15-84

Polysiphonia setacea Hollenberg (90%)
Ectocarpus indicus Sonder (10%)
Schizonema pascheri Bharadwaja (most are red in color)
Cladophora sp. (covered with diatoms such as, Mastogloea, Licmophora, and Navicula)
Several roundworms 0.5 mm long
Derbesia marina (Lyngb.) Sol.
Lepas (barnacles)

Turtle spewing 02, Sector 01, turtle 5-26-83

Liagora papenfussii (99%)
Turbinaria ornata (Turn.) J. Ag.(1%)
Laurencia sp. (trace)

Turtle spewing, Sector 01, 5-26-83

Trichogloea lubrica (Harv.) J. Ag. (99%)
Turbinaria ornata (trace)
Padina japonica (trace)

Kiholo Bay reef collection 8-84

Ceramium sp. (trace)
Valonia aegagropila C. Ag. (10%)
Hypnea pannosa (trace)
Gelidium sp.
Gelidiella machrisiana (90%) I am not sure of this identification and will work more to find out what it is.

Dillingham Field, Oahu, spear mortality

Amansia glomerata C. Ag.

Green turtle mortality, Oahu, SL-76.7cm, Balazs, July 1984

Amansia glomerata (99%)
Spyridia filamentosa (Wulfen) Harvey (1%)
Turbinaria ornata (Turner) J. Ag. (trace)
Codium edule Silva (trace)

Sample No. 83-PH 1mm/8, Mouth, PH 1983-8

Laurencia sp. (99%)
Foraminifera shells
Jania capillacea (trace)
Lyngbya sp. (trace)
Centroceros clavulatum (trace)

PH 83/1MM-11 Mouth PH 1983-11

Dictyospheria versluysii (20%)
Laurencia sp. (80%)
Halimedia discoidia Decaisne (trace)
Centroceros clavulatum (trace)
Ceramium sp. (trace)

Mouth PH 1983-12 PH83/1MM-12

Laurencia cartilaginea Yamada
Griffithsia sp. (trace)
Lyngbya majuscula (trace)

Mouth PH 1983-13, PH 83-1MM/13

Laurencia cartilaginea

Turtle scraping tag #3499, 8-84

Sphacelaria novaehollandiae Sonder (90%)
Acrochaetium sp.
Chaetomorpha sp. (?)
Jania capillacea
Peysonellia sp. (red crust) (10%)
Mytilis edulus (mussel)

Hilo, 1984, 40kg green turtle

* Green masses of chopped seaweed with Cocconeis (diatoms) on them
Pterocladia sp. ? (cannot identify because it is too finely chopped)

* Rinsed feces, 1984

Amansia glomerata (trace)
Pterocladia sp. ? finely chopped (99%)

Kiholo fresh water pond 8-84

Enteromorpha clathrata var. crinita (Roth) Hauck, tubular green finely branched, (40%)
Ulothrix sp. (fine unbranched green alga) (50%)
Higher plant material (grass ?) (5%)
Many small gastropods (5%)

SUMMARY LIST OF ALGAE IN THESE SAMPLES

CHLOROPHYTA
Bryopsis pennata var. secunda (Harvey) Coll. and Harv.
Caulerpa racemosa (Forsskal) J. Ag.
Caulerpa webbiana Mont.
Chaetomorpha sp.
Cladophora sp.
Codium arabicum Kutzing
Codium edule Silva
Derbesia marina (Lyngb.) Sol.
Dictyosphaeria cavernosa (Forsskal) Boerg.
Dictyosphaeria versluysii Weber van Bosse
Enteromorpha clathrata var. crinita (Roth) Hauck
Halimedia discoidia Decaisne
Ulothrix sp.
Valonia aegagropila C. Ag.

* My delay was largely due to trying to ID these samples.

RHODOPHYTA
Acrochaetium sp.
Amansia glomerata C. Ag.
Centroceros clavulatum (C. Ag.) Montagne
Ceramium sp.
Gelidiella machrisiana*
Gelidium pusillum (Stackhouse) Le Jolis
Gelidium sp.
Griffithsia sp.
Hypnea pannosa J. Ag.
Jania capillacea Harvey
Laurencia cartilaginea Yamada
Laurencia majuscula Harv. Lucas
Laurencia nidifica J. Ag.
Laurencia sp.
Laurencia undulata Yamada
Liagora papenfussii Abbott
Peysonellia sp.
Polysiphonia poko Hollenberg
Polysiphonia setacea Hollenberg
Polysiphonia sp.
Pterocladia capillacea (Gmelin) Bornet
Pterocladia sp.
Trichogloea lubrica (Harv.) J. Ag.
Spyridia filamentosa (Wulfen) Harvey
Wurdemannia miniata (Lamour.) Feldmann and Hamel

PHAEOPHYTA
Ectocarpus indicus Sonder
Padina japonica Yamada
Sphacelaria novaehollandiae Sonder
Turbinaria ornata (Turn.) J. Ag.

CYANOPHYTA
Lyngbya majuscula Gomont
Lyngbya sp.
Microcoleus acutissimus Gardner
Schizonema pascheri Bharadwaja

DIATOMS (CHRYSOPHYTA)
Cocconeis
Licmophora
Mastogloea
Navicula

*I need to find the authors to these species.

George,

Thank you for the "History of Sea Turtles at Polihua Beach, Northern Lanai", and for the articles you have sent to me. This past week (December 12-23, 1984) I was with a Hawaiian Marine Bilogy class on Maui. I found piles of limu on the beach at Launiupoko Park, about 3 miles toward Olowalu from Lahaina. It was Hypnea musciformis, which was originally introduced to Kaneohe Bay. It was not present at this park two years ago, but now is abundant there and also at Halama Park in Kihei. This alga was in your samples numbered GB-29; GB-533; GB-601; GB-755; GB-757; GB-758; GB-1041; and GB-1042. I am trying to get a manuscript out on Acanthophora and may include Hypnea musciformis distribution in it as well. Sometime in the future I might ask you for the locations and dates of these samples.

Just a few hundred yards off shore at Launiupoko we saw two green turtles swimming near the bottom in about 30 ft of water. My trip was too quick and we spent only two hours on Oahu, so maybe next time I'll give a call and try to visit you.

I'm sending the samples under a separate cover.

Aloha,

Dennis

Dennis J. Russell

...URAL AND MATHEMATICAL SCIENCES
Biology Department
SEATTLE PACIFIC UNIVERSITY
(206) 281-2140 • SEATTLE, WASHINGTON 98119

15 February 1983

George Balazs
National Marine Fisheries Service
Honolulu Laboratory
P.O. Box 3830
Honolulu, Hawaii 96812

Dear George,

Fortunately, I was able to take a class to Maui this past December holiday for two weeks. Afterwards I spent two quick days on Oahu, visited the U. of H. and some friends. I called your home once, but must have missed you. As soon as school started again I received two manuscripts back from publishers for revision and have just finished those etc. Your samples are on my desk with nothing else and I hope to finish them all before March 11, when I leave with a study tour to Mexico. With all of this activity one would seem to think all was going well and secure, but our university is calling for a 3% cut this year and maybe another 3% cut next year and I only hope my job will survive. Time will tell.

In the mean time, enclosed are two sample bottles and a short list of the algae found inside them. I am sending them first since you indicated a need for them sooner than the others. I hope all is going well with you and your family.

Aloha,

Dennis

Lisianski 8/27/82

#6312 & 6313

Gelidium pusillum (Stackhouse) LaJolis	99%
Jania capillacea Harvey	1%
Herposiphonia sp.	Trace

Lisianski 8/27/82

#6314 & 6415

Gelidium pusillum	4%
Jania capillacea Harvey	95%
Caulerpa racemosa (Forsskal) J. Ag.	1%
Laurencia tenera Tseng	Trace
Ceramium sp.	Trace
Polysiphonia sp.	Trace

Identified by Dennis J. Russell, Seattle Pacific University, 15 February 1983.

LA·83 mouth sample recovered from turtle number 5897 5898 that was caught while snorkeling 31 March 1982. 'NW Cove Reef' (near camp)

LA·85 mouth sample recovered from turtle number 5880 5881, that was caught while it was feeding on a NW Cove reef that was awash on 19 March 1982.

No aspirated samples or gut samples.
Information is not included in the 1982 paper

The marine algae collected from sea turtles and from the reefs on Laysan Island, by Alan Kam in March and April 1982. Identified by Dennis J. Russell accordingly as this list, May 1983.

LA 01

Plocamium brasiliense (male, female and tetrasporophytes)
Laurencia sp.
Dictyota friabilis
Bryopsis pennata
Jania micrarthrodia

LA 02

Laurencia cartilaginea 90%
Dictyota friabilis 10%
Zonaria sp.
Amphiroa fragilissima

LA 03

Bryopsis plumosa 99%
Plocamium sandvicensis 1%
Dictyota friabilis Trace
Laurencia nidifica Trace
Corallina sp. Trace

LA 04

Asparagopsis taxiformis

LA 05

Turbinaria ornata 40%
Laurencia cartilaginea 40%
Bryopsis hypnoides 15%
Asparagopsis taxiformis 5%
Amphiroa fragilissima Trace
Jania capillacea Trace

LA 21

Caulerpa racemosa var. peltata 90%
Halimeda discoidea 10%
Corallina Trace

LA 22

Asparagopsis taxiformis 90%
Chondrococcus hornemanni 10%
Halimeda discoidea Trace

LA 23

Microdictyon montagnei

LA 37

Microdictyon montagnei

LA 38

Asparagopsis taxiformis

LA 39

Caulerba webbiana 99%
Chondrococcus hornemanni 1%
Halimeda opuntia

LA 40

Asparagopsis taxiformis 80%
Halimeda discoidea 10%
Dictyota friagilis 5%
Chondrococcus hornemanni 5%
Hypnea spinella Trace
Ceramium sp. Trace
Amphiroa fragilissima Trace
Caulerpa webbiana Trace

LA 60

Asparagopsis taxiformis 20%
Halimeda discoidea 5%
Codium edule 5%
Dictyota stolonifera Trace
Caulerpa racemosa var. peltata 5%
Ulva fasciata 40%
Plocamium sandvicensis Trace
Corallina sp. Trace
Amphiroa anastomosans 10%
Martensia fragilis 10%
Laurencia decumbens 5%

LA 70

Sargassum echinocarpum
Zonaria sp.
Dictyosphaeria versluysii
Halimeda discoidea
Champia parvula
Microdictyon montagnei
Dictyota acuteloba
Laurencia nidifica
Polysiphonia saccorhiza (on Laurencia)
Ceramium sp.
Laurencia galtsoffi
Chondria sp.

LA 81

Polysiphonia tsudana

LA 82

Polysiphonia tsudana
Barnacles Trace
Diatoms Trace
Cladophora sp. Trace

LA 83

Caulerpa lentillifera 90%
Caulerpa racemosa var.peltata 10%

LA 84

Cladophoropsis membranacea
Microdictyon sp. Trace
Herposiphonia parca

LA 85

Caulerpa lentillifera

LA 86

Caulerpa lentillifera
Herposiphonia parca (abundant as an epiphyte)
Microdictyon montagnei
Herposiphonia variabilis
Laurencia sp.

The following is a listing of the different species contained in the above samples:

CHLOROPHYTA

Bryopsis hypnoides Lamx.
Bryopsis pennata Lamx.
Bryopsis pennata var. secunda (Harvey) Collins and Harvey
Bryopsis plumosa (Hudson) C. Ag.
Caulerpa lentillifera J. Ag.
Caulerpa racemosa var. peltata (Lam.) Eubank
Caulerpa racemosa var. turbinata (J. Ag.) Eubank
Caulerpa webbiana Mont.
Cladophora sp.
Cladophoropsis membranacea (C. Ag.) Boerg.
Codium edule Silva
Dictyophaeria versluysii Weber van Bosse
Halimeda discoidea Decaisne
Halimeda micronesica Yamada
Halimeda opuntia (L.) Lamx.
Halimeda sp.
Microdictyon montagnei Harvey
Microdictyon sp.
Monostroma oxyspermum (Kützing) Doty
Ulva fasciata Delile
Valonia aegagropila C. Ag.

PHAEOPHYTA

Dictyota acuteloba J. Ag.
Dictyota friabilis Setchell
Dictyota stolonifera
Hydroclathrus clathratus (C. Ag.) Howe
Sargassum echinocarpum J. Ag.
Turbinaria ornata (Turner) J. Ag.
Zonaria sp.

RHODOPHYTA

Amphiroa anastomosans Weber von Bosse
Amphiroa fragilissima (L.) Lamx.
Asparagopsis taxiformis (Delile) Coll. and Harvey
Ceramium sp.
Champia parvula (C. Ag.) Harvey
Chondria sp.
Chondrococcus hornemanni (Mert.) Schmitz
Corallina sandvicensis Lemm.
Corallina sp.
Fosliella farinosa (Lamx.) Howe
Gelidium crinale (Turn.) Lamx.
Herposiphonia parca Setchell
Herposiphonia variabilis Hollenberg
Hypnea spinella (J. Ag.) Kützing
Jania capillacea Harvey
Jania micrarthrodia Lamx.
Laurencia cartilaginea Yamada
Laurencia decumbens Kützing
Laurencia galtsoffi Howe
Laurencia nidifica J. Ag.
Laurencia sp.
Martensia fragilis Harvey
Plocamium brasiliense (Greville) Howe and Taylor
Plocamium sandvicense J. Ag.
Polysiphonia saccorhiza (Collins and Hervey) Hollenberg
Polysiphonia tsudana Hollenberg
Trailliella sp.

ATURAL AND MATHEMATICAL SCIENCES SEATTLE PACIFIC UNIVERSITY (206) 281-2140 • SEATTLE, WASHINGTON 98119

18 May 1983

George Balazs
National Marine Fisheries Service
Honolulu Laboratory
P.O. Box 3830
Honolulu, Hawaii 96812

Dear George,

I have finally finished the algae identifications for you. Enclosed is the master list of sample contents and the summary of species according to Division. All went well, a few species stumped me for awhile, but eventually I found them in the literature (Plocamium brasiliense may be a new record for Hawaii). A better algologist than myself may differ in their opinion as to the species according to published observations, but fortunately you have all of the life stages in your sample! This will help anyone following to better pin-point the species. It is a very narrow thallus, highly branched and very interesting.

I must admit, to my embarrassment, that somehow I must have mixed No. 26 in with another sample. I have the algae identified, but cannot find the sample. I hope this does not effect you data. Please excuse the error.

The bill for this work has been sent to Mary L. Godfrey, the samples have been placed into jars (most of them), and into their original bags, and are being sent to you by separate mail.

I certainly hope everything is working out for the best for you and your family. We receive no news about Hawaii state at all, but I assume all is normal. Please feel free to send more samples as you gather them and set a dead-line if you need to have the results quicker than this last batch.

Aloha,

Dennis J. Russell

The Marine Algae Present in Turtle Gut Samples Collected in The Hawaiian Islands by George H. Balazs, Hawaii Institute of Marine Biology. Algae identified by Dennis J. Russell, Seattle Pacific University, January 1982.

GB-1000

Acanthophora spicifera
Hypnea sp.

GB-1001

Cladophora socialis var. hawaiiana

GB-1005

Ulva rigida	94%
Codium edule	1%
Gelidiella myrocladia	1%
Acanthophora spicifera	1%
Cladophora trichotoma	1%
Terrestrial grass	1%
Casuarina equisetifolia (tree)	1%

GB-1010

Acanthophora spicifera
Centroceros clavulatum

GB-1011

Codium sp.	Trace
Oscillatoria sp.	"
Hypnea cervicornis	"
Jania capillacea	"

GB-1012

Laurencia sp.

GB-1013

Acanthophora spicifera	90%
Valonia aegagropila	Trace
Isopod	Trace
Mucus balls	10%

GB-1014

Gelidium pusillum

GB-1020

Gelidium pusillum	99%
Sponge	1%

GB-1030

Valonia ventricosa
Gelidium pusillum
Valonia aegagropila
Tolypiocladia calodictyon
Jania capillacea
Dictyota friabilis
Ceramium sp.
Biddulphia sp. (pseudothallus)
Herposiphonia nuda

GB-1040 (Lilipuna, 1980, Hirota)

Hypnea musciformis	99%
Codium edule	1%
Lyngbya majuscula	Trace
Acanthophora spicifera	Trace
Laurencia nidifica	Trace
Gracilaria coronopifolia	Trace

GB-1041 (Lilipuna)

Hypnea musciformis	99%
Codium arabicum	1%
Acanthophora spicifera	Trace
Sargassum echinocarpum	Trace

GB-1042

Hypnea musciformis	99%
Gracilaria coronopifolia	Trace
Sargassum echinocarpum	Trace
Codium edule	Trace
Codium arabicum	1%

GB-1050

Gelidium pluma	
Dictyota friabilis	Trace

GB-1051

Pterocladia capillacea
Laurencia nidifica
Jania capillacea
Dasya pedicellata
Galaxaura fasciculata
Turbinaria ornata
Valonia aegagropila

GB-1052

Gracilaria coronopifolia
Corallina sandvicensis
Amphiroa fragilissima
Laurencia majuscula
Galaxaura cylindrica
Amansia glomerata
Jania capillacea
Chondrococcus hornemanni

GB-1053

Plocamium sandvicense
Amphiroa fragilissima
Asparagopsis taxiformis
Spyridia filamentosa
Martensia fragilissima
Colpomenia sinuosa
Laurencia galtsoffi
Laurencia subsimplex
Valonia aegagropila
Microdictyon japonicum

GB-1060

Gelidium reediae

GB-1061

Amansia glomerata (tetrasporic)

GB-1062

Gelidium pusillum

GB-1063

Hypnea pannosa

GB-1064

Gelidium reediae
Ulva reticulata Trace

GB-1065 (Napili, 22 Apr 1981)

Acanthophora spicifera

GB-1066

Ulva rigida

GB-1067

Galaxaura cylindrica
Ulva reticulata Trace

GB-1068

Pterocladia caerulescens

GB-1069 (Napili, 22 Apr 81)

Ulva reticulata	
Acanthophora spicifera	Trace
Gelidium reediae	Trace

GB-1070

Jania capillacea
Dictyota friabilis

GB-1071

Amphiroa sp.

GB-1072

Sargassum echinocarpum	
Ectocarpus padinae	Epiphytic

GB-1080

Acanthophora spicifera	55%
Ulva reticulata	10%
Hypnea cervicornis	5%
Gelidiella acerosa	5%
Laurencia nidifica	Trace
Amansia glomerata	Trace
Codium arabicum	Trace
Gelidium pusillum	Trace

GB-1081

Codium arabicum	40%
Codium edule	30%
Gelidium pusillum	Trace
Amansia glomerata	Trace
Acanthophora spicifera	Trace
Black Colonial animal	Several lumps

GB-1082

Ulva reticulata	90%
Codium arabicum	10%
Valonia aegagropila	Trace
Acanthophora spicifera	Trace
Gelidium pusillum	Trace
Black Colonial animal	Several lumps

List of algae in samples GB-1000 to GB-1082

CHLOROPHYTA

Cladophora socialis var. hawaiiana Brand.
Cladophora trichotoma (Ag.) Kützing
Codium arabicum Kützing
Codium edule Silva
Codium sp.
Microdictyon japonicum Setchell
Ulva reticulata Forsskal
Ulva rigida C. Ag.
Valonia aegagropila C. Ag.
Valonia ventricosa J. Ag.

RHODOPHYTA

Acanthophora spicifera (Vahl) Boerg.
Amansia glomerata C. Ag.
Amphiroa fragilissima (L.) Lamx.
Amphiroa sp.
Asparagopsis taxiformis (Delile) Coll. and Harvey
Centroceros clavulatum (C. Ag.) Montagne
Ceramium sp.
Chondrococcus hornemanni (Mert.) Schmitz
Corallina sandvicensis Lemm.
Dasya pedicellata (C. Ag.) C. Ag.
~~Dermatolithon sp.~~ Heteroderma subtilissima (Foslie) Foslie
Galaxaura cylindrica (Ellis and Solander) Lam.
Galaxaura fasciculata Kjellman
Gelidiella acerosa (Forsskal) Feldmann and Hamel
Gelidiella myrocladia (Boerg.) Feldmann
Gelidium pluma Loomis
Gelidium pusillum (Stackhouse) Le Jolis
Gelidium reediae Loomis
Gracilaria coronopifolia J. Ag.
Herposiphonia nuda Hollenberg
Hypnea cervicornis J. Ag.
Hypnea musciformis (Wulfen) C. Ag.
Hypnea pannosa J. Ag.
Hypnea sp.
Jania capillacea Harvey
Laurencia galtstoffi Howe
Laurencia majuscula (Harv.) Lucas
Laurencia nidifica J. Ag.
Laurencia subsimplex Tseng
Laurencia sp.
Martensia fragilis Harvey
Plocamium sandvicense J. Ag.
Pterocladia caerulescens (I cannot find the author of this one)
Pterocladia capillacea (Gmelin) Bornet
Spyridia filamentosa (Wulfen) Harvey
Tolypiocladia calodictyon (Harv.) Silva

PHAEOPHYTA

Colpomenia sinuosa (Roth) Dèrbes and Solier
Dictyota friabilis Setchell
Ectocarpus padinae (Buffham) Savageau
Sargassum echinocarpum J. Ag.

CYANOPHYTA

Lyngbya majuscula (Dillw.) Harvey
Oscillatoria sp.

BACILLARIOPHYTA (Diatoms)

Biddulphia sp.

TRACHEOPHYTA (Higher Plants)

Casuarina equisetifolia L.

George,

I will be making a master list of all the algae that I have identified for you up until now. I will use this list to validate the author's names and to facilitate future identification jobs you may have for me. If you want a copy of this list just let me know.

Dennis

ALGAE SAMPLES

GB	1000	Porkchop Reef, Kaneohe Bay Tag. 3332 3/24/81
	1001	Scrapings from outside of turtle shell specimen from Hull Island, Phoenix
	1005	Fecal pellet # 2936
	1010	Kiholo Bay, Hawaii 5-8 March 1981 # 3297
	1011	" # 3312
	1012	" 3304
	1013	" 3297
	1014	" 3320
	1020	Kiholo Lagoon, 6 March 1981 SCUBA bottom sample alga
	1030	Kiholo Bay 7 March 1981 10-15' deep outside area SCUBA - Kam
	1040	Hirota - Lilipona 1980 Primary Stomach
	1041	" Seconday
	1042	" Intestines
	1050	Poipo, Kauai - Brennecke Beach 6 April 1981
	1051	Kaakaanio, Kauai ① 9 April 1981
	1052	" ② total sample divided into 3 bottles
	1053	" ③

cont'd

AE SAMPLES

GB 1060 - 1072 Napili, Maui 22 Apr. 1981
(13 samples sent)

1080 Fish + Game confiscation evidence PRIMARY 1981
1081 " SECONDARY
1082 " INTESTINES

SAVED and put aside for Bill Cook

⊛ GB 1021 Kiholo Lagoon, 6 March 1981 Scuba
bottom sample sediment

GB 1043 Hirota - Lilipuna 1980 parasite
Ozobranchus?

OF NATURAL & MATHEMATICAL SCIENCES

SEATTLE PACIFIC UNIVERSITY

(206) 281-2140 · SEATTLE WASHINGTON 98119

8 July 1981

George,

I found sample NB-828 ——

traces of Hypnea cervicornis
Jania capillacea
Padina japonica
Ceramium sp.

Aloha,

Send More if you dare them.

The Marine Algae Present in Turtle Gut Samples Collected in the Hawaiian Islands by George H. Balazs, Hawaii Institute of Marine Biology. Algae identified by Dennis J. Russell, Seattle Pacific University, June 1981.

GB-800	
Amansia glomerata	1%
Codium arabicum	50
Codium edule	49
GB-801	
Codium edule	75%
Codium arabicum	25
Pterocladia capillacea	trace
Dictyosphaeria versluysii	trace
Amansia glomerata	trace
GB-802	
Codium edule	90
Codium arabicum	5
Amansia glomerata	5
Halophila ovalis	trace
GB-803	
Sphacelaria tribuloides	98
Acrochaetium sp.	1
Gelidiella adnata	1
Lyngbya sp.	trace
GB-804	
Spyridia filamentosa	100
Laurencia sp.	trace
GB-805	
Laurencia majuscula	99
Centroceros clavulatum	
Ceramium sp.	
Sphacelaria sp.	
Acrochaetium sp.	
GB-806	
Spyridia sp.	
Fine acellular material	
GB-807	
Galaxaura cylindrica	
GB-808	
Lyngbya majuscula	Mostly
Lyngbya lagerheimii	(mixture of
Anabaena constricta	other blue-greens)
Anabaena variabilis	

GB-809
Spyridia filamentosa

GB-810
Animal-colonial ascidian?

GB-811
Microdictyon setchellianum

GB-812
Animal-tube worms?

GB-813
Spyridia filamentosa

GB-814

Halimeda opuntia	50
Sphacelaria tribuloides	trace
Centroceros clavulatum	trace
Spyridia filamentosa	50

GB-815
Laurencia tenera

GB-816
Zonaria hawaiiensis

GB-817

Halimeda opuntia	50
Dictyota divaricata	50
Spyridia filamentosa	trace

GB-818
(no sample)

GB-819
Red alga (genus ?)
Bacteria

GB-820

Gelidium sp.	trace
Jania sp.	trace

GB-821
Valonia aegagropila

GB-822

Gelidiella adnata	trace

GB-823

Gelidiella adnata	trace
Oscillatoria sp.	trace

GB-824

Pterocladia sp.	trace

GB-825

Pterocladia sp.	trace
Valonia aegagropila	trace

GB-826	
Polysiphonia sp.	trace
Ceramium sp.	trace
Jania capillacea	trace
GB-827	
Pterocladia calaglossoides	
GB-828	
(no sample)	
GB-829	
Pterocladia calaglossoides	
Hypnea sp.	
Valonia aegagropila	
Ulva sp.	
GB-830	
Gelidiella adnata	
GB-831	
Hypnea sp.	trace
Spyridia filamentosa	mostly
Pterocladia sp.	trace
Man-made red fibers	trace
GB-832	
Gelidiella adnata	
GB-833	
Pterocladia sp.	trace
GB-834	
Gelidiella adnata	
GB-835	
Laurencia sp.	trace
Valonia aegagropila	trace
Gelidiella sp.	trace
GB-836	
Oscillatoria sp.	trace
Centroceros clavulatum	trace
Gelidiella setacea	trace
GB-837	
Spyridia filamentosa	
GB-838	
Halophila hawaiiana	
GB-839	
Halimeda opuntia	
Spyridia filamentosa	trace
GB-840	
Acanthophora spicifera	99
Dictyota divaricata	1

GB-841

Dictyota divaricata	90
Halophila hawaiiana	10
Acanthophora spicifera	trace

GB-842

Dictyota divaricata

GB-843

Padina japonica	99
Halophila hawaiiana	1

GB-844

Sphacelaria sp.

GB-845

Hypnea cervicornis	99

GB-846

Callithamnion byssoides

GB-847

Lyngbya majuscula

GB-848

Polysiphonia sphaerocarpa

GB-849

Ceramium sp.

GB-850

Codium edule	90
Codium arabicum	10

Black leathery non-algal material

GB-851

Caulerpa sertularioides	90
Turbinaria ornata	5
Derbesia fastigiata	5
Sphacelaria furcigera	trace
Halimeda discoidea	trace

a few micromollusks (snails)

GB-852

Caulerpa sertularioides	95
Turbinaria ornata	5
Microdictyon setchellianum	trace
Halimeda discoidea	trace

GB-853

Turbinaria ornata (not digested)	95
Caulerpa sertularioides	5
Microdictyon setchellianum	trace

One small worm (placed into a special vial so you can find it)

GB-854

Ulva fasciata	
Laurencia?	trace

GB-855
Animal material, many 1 mm diameter eggs, mollusk shells

GB-856
Animal material
Shells

GB-857
Ulva reticulata 99
Codium edule 1

GB-858
Codium edule
Ulva reticulata

GB-900
Microdictyon setchellianum

GB-901
Halimeda discoidea

GB-902
Porolithon gardinerii

GB-903
Porolithon sp.

GB-904
Porolithon gardinerii
Cladophoropsis luxurians

GB-905
Dictyosphaeria versluysii

GB-906
Lyngbya majuscula

GB-907
Schizothrix calcicola

GB-908
Polysiphonia (new species ?) tetrasporic
Valonia aegagropila

GB-909
(no sample)

GB-910
Caulerpa urvilliana

GB-911
Halimeda discoidea

GB-912
Laurencia majuscula

GB-913
Red patches are animal material

GB-914
Porolithon sp.

List of algae in samples GB-800 to GB-858 and GB-900 to GB-914

CHLOROPHYTA

Caulerpa sertularioides (Gmelin) Howe
Caulerpa urvilliana Montagne
Codium arabicum Kützing
Codium edule Silva
Derbesia fastigiata Taylor
Dictyosphaeria versluysii Weber van Bosse
Halimeda discoidea Decaisne
Halimeda opuntia (L) Lamouroux
Microdictyon setchellianum Howe
Ulva sp.
Ulva fasciata Delile
Ulva reticulata Forsskal
Valonia aegagropila C. Ag.

RHODOPHYTA

Acanthophora spicifera (Vahl) Boerg.
Acrochaetium sp.
Amansia glomerata C. Ag.
Callithamnion byssoides Arnott
Centroceros clavulatum (C. Ag.) Montagne
Ceramium sp.
Galaxaura cylindrica (Ellis and Solander) Lamouroux
Gelidiella adnata Dawson
Gelidiella setacea (Feldmann) Feldmann and Hamel
Hypnea sp.
Hypnea cervicornis J. Ag.
Jania sp.
Jania capillacea Harvey
Laurencia sp.
Laurencia majuscula (Harvey) Lucas
Laurencia tenera Tseng
Pterocladia sp.
Pterocladia calaglossoides
Pterocladia capillacea (Gmelin) Bornet
Polysiphonia sp.
Polysiphonia sphaerocarpa Boergesen
Porolithon sp.
Porolithon gardineri (Floslie) Foslie
Spyridia sp.
Spyridia filamentosa (Wulfen) Harvey

PHAEOPHYTA

Dictyota divaricata Lamouroux
Padina japonica Yamada
Sphacelaria sp.
Sphacelaria tribuloides Meneghini
Sphacelaria furcigera Kützing
Turbinaria ornata (Turn.) J. Ag.
Zonaria hawaiiensis (Lamoureux) C. Ag.

CYANOPHYTA

Anabaena constricta (Szafer) Geitler
Anabaena variabilis Kützing
Lyngbya sp.
Lyngbya lagerheimii (Möbius) Gomont
Lyngbya majuscula Gomont
Oscillatoria sp.
Schizothrix calcicola (Ag.) Gomont

SEAGRASS

Halophila ovalis (R. Br.) Hook

D. J. Russell

SEATTLE
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SCHOOL OF NATURAL & MATHEMATICAL SCIENCES
SEATTLE WASHINGTON 98119

13 Jan '81

George,

Thank you for the calendar - I love it!!

Sorry I missed you when I was in Hawaii. My main effort was to wrestle with my committee over my dissertation - Yes, it is still in limbo. I didn't finish your samples on time so had to come back & work on them some more. Here (over)

are the results. If you have more please send them. I shouldn't be so busy for the next 4-5 months.

Alice,

Dennis

P.S. Your publications impressive. Thanks for the acknowledgement.

The Marine Algae Present in Turtle Gut Samples Collected in the Hawaiian Islands by George H. Balazs, Hawaii Institute of Marine Biology. Algae Identified by Dennis J. Russell, Seattle Pacific University, December 1980.

GB-700 3/18/80 3318+3322 PL Scraping

	Percent of Sample
Acrochaetium gracile	99
Black sand	

GB-701 " 3303 stomach

Oscillatoria sp.
Plus an unknown alga

GB-702 " 3311 stomach

Oscillatoria sp.
Wurdemannia miniata

GB-703 " 3299 stomach

Oscillatoria sp.	90
Wurdemannia miniata	10
Sponge spicules	Tr
Epithelial cells	Numerous

GB-704 " 3305 stomach

Gelidium sp.	99
Microcystis sp.	1

GB-705 5/7/80 2544, 2545 stomach

Oscillatoria sp.	100

GB-706 5/7/80 Bellows 2542, 2543 stomach

Oscillatoria sp.	100
Claw-shaped objects (1 mm long)	

GB-707 3/25/80 KURE 2538 stomach

Not recognizable

GB-708 " KURE 2482 → 2485 stomachs

Ulva fasciata
Acrochaetium sp.
Hypnea cervicornis

GB-709 2/78 algae growing on loggerhead barnacle

Gelidiella adnata

GB-710 3/25/80 KURE 2471 growth on tag

Jania ungulata
Sphacelaria furcigera

GB-711 4/11/80 Bellows 2538, 2539 chin scrapings

Enteromorpha tubulosa	90
Cladophora sp.	10

GB-712 4/11/80 Bellows 2540, 2541 stomach

(vial not present?)

GB-713 5/14/80 Bellows 2335 stomach

Ulva fasciata
Sargassum polyphyllum (? too small of a scrap to tell on this specimen)
Hypnea cervicornis

GB-714 " " 3461, 3462 stomalgae

Lyngbya semiplena	50
Polysiphonia scropulorum	Tr
Sphacelaria furcigera	50

GB-715 " " 3455, 3456 stomach

Oscillatoria sp.	100

GB-716 " " 3461, 3462 stomach

Hypnea cervicornis
Ulva fasciata

GB-717 " " 3090 stomach
A fungus of some sort. I could not find fruiting bodies to be sure.

GB-718 " " 3465, 3466 stomach

Claw-like objects

GB-719 " " 2335 stomach

Ulva fasciata

GB-720 " " 3457 stomach

Oscillatoria sp.	50
Monostroma sp. (I am not sure of this ID because it may be a scrap of Enteromorpha)	50

GB-721 " " tag unknown - stomach

Oscillatoria sp.	Tr
Hypnea cervicornis	Tr
Sargassum polyphyllum (?)	Tr

GB-722 " " 3459, 3460 stomach

Hypnea cervicornis
Amphipod

GB-723 " " 3453, 3454 stomach

Terrestrial grass

GB-724 5/14/80 Bellows 3325 from mouth

Oscillatoria sp.	Tr
Ulva fasciata	

GB-725 " " 3090 scraping from tag

Gelidiella adnata	80
Sphacelaria furcigera	20
A siphonous green filament	Tr

GB-726 (GB 726-740 - April 17-19, 1980 Bellows feces)

Codium edule	90
Ulva rigida	10
Halimeda discoidea	Tr
Polyopes sp.	Tr
Chnoospora sp.	Tr
Terrestrial grass	
Black and white animal (3 cm long x 0.5 cm wide)	

GB-727

Ulva rigida	50
Codium edule	50
Gelidium sp.	Tr
Terrestrial grass	
Opalescent animal?	

GB-728

Codium edule	70
Amansia glomerata	30
Blade of grass	

GB-729

Codium edule	50
Ulva rigida	50
Opalescent animal	
Terrestrial plants	

GB-730

Ulva rigida	70
Codium edule	20
Terrestrial plants	10

GB-731

Ulva rigida	30
Codium edule	70
Chnoospora sp.	Tr

GB-732

Ulva rigida	50
Codium edule	50
Chnoospora sp.	Tr

GB-733

Codium edule	70
Ulva rigida	30
Dictyosphaeria versluysii	Tr
Padina japonica	Tr
Chnoospora sp.	Tr
Terrestrial plants	Tr

GB-734

Codium edule	50
Ulva rigida	50

GB-735

Ulva rigida	50
Codium edule	50
Codium arabicum	Tr
Terrestrial plants	Tr

GB-736

Codium edule	50
Ulva rigida	50
Gelidium pusillum	Tr

GB-737

Codium edule	90
Ulva rigida	10
Plant fibers	Tr

GB-738

Codium edule	30
Ulva rigida	30
Gelidium pusillum	30
Black leathery mass (animal?)	

GB-739

Ulva rigida	99
Gelidium pusillum	1
Codium edule	Tr
Fishing line	
Animal hairs	
Ironwood tree branches	

GB-740

Ulva fasciata	99
Gelidium pusillum	1
Plastic sheet	
Animal hairs	
Ironwood tree branches	
Terrestrial grass	

GB-741 3/18 – 3/24/80 Kiholo - tide pool sluice gate

Gelidium crinale

GB-742

Gelidium crinale	80
Amphiroa fragilissima	20

GB-743

Gelidium pusillum

GB-744

Gelidium pusillum

GB-745

Ahnfeltia concinna

GB-746 3/18 - 3/24/80 KiHoLo

Acanthophora spicifera

GB-747

Gelidiopsis variabile

GB-748

Valonia aegagropila

GB-749

Pterocladia calaglossoides	
Acanthophora spicifera	Tr

GB-750

Gelidium crinale

GB-751

Ralfsia occidentalis

GB-752

Ahnfeltia concinna

GB-753

Ulva fasciata

GB-754 Bellows 5/13 - 5/15/80 from net

Acanthophora spicifera	80
Griffithsia ovalis	5
Hypnea spinella	5
Halimeda discoidea	10

GB-755

Acanthophora spicifera	10
Spyridia filamentosa	50
Hypnea musciformis	10
Gelidiopsis variabile	30

Bellows
5/13 - 5/15/80 from net

GB-756

Ahnfeltia concinna
Hypnea cervicornis

GB-757

Hypnea musciformis

GB-758

Hypnea musciformis	99
Laurencia nidifica	1

GB-759

Hypnea cervicornis

GB-760

Rosenvingea intricata

GB-761

Hypnea cervicornis

GB-762

Hypnea cervicornis

GB-763 3/24 - 3/26/80 KURE, EAST REEF COLLECTION

Sargassum echinocarpum (probably)

GB-764

Laurencia mariannensis

GB-765

Trichogloea lubrica

GB-766

Caulerpa racemosa

GB-767

Liagora maxima

GB-768

Rosenvingea intricata

List of algae in samples GB-700 to GB-768

CHLOROPHYTA

Caulerpa racemosa (Forsskal) J. Ag.
Cladophora sp.
Codium arabicum KÜtzing
Codium edule Silva
Dictyosphaeria versluysii Weber van Bosse
Enteromorpha tubulosa KÜtzing
Halimeda discoidea Decaisne
Monostroma sp. ?
Ulva fasciata Delile
Ulva rigida C. Ag.
Valonia aegagropila C. Ag.

RHODOPHYTA

Acanthophora spicifera (Vahl) Boerg.
Acrochaetium gracile Boerg.
Acrochaetium sp.
Ahnfeltia concinna J. Ag.
Amphiroa fragilissima (L.) Lamx.
Gelidiopsis variabile J. Ag.
Gelidium adnata Dawson
Gelidium crinale (Turn.) Lamx.
Gelidium pusillum (Stackhouse) LaJolis
Gelidium sp.
Griffithsia ovalis Harvey
Hypnea cervicornis J. Ag.
Hypnea musciformis (Wulfen) C. Ag.
Hypnea spinella (J. Ag.) KÜtzing
Jania ungulata Yendo
Laurencia mariannensis Yamada
Laurencia nidifica J. Ag.
Liagora maxima Butters
Polysiphonia scropulorum Harvey
Pterocladia calaglossoides (Howe) Dawson
Spyridia filamentosa (Wulfen) Harvey
Trichogloea lubrica (Harv.) Butters
Wurdemannia miniata (Lamark and DeCandelle) Feldmann and Hamel

PHAEOPHYTA

Chnoospora sp.
Padina japonica Yamada
Ralfsia occidentalis Hollenberg
Rosenvingea intricata (J. Ag.) Boerg.
Sargassum echinocarpum J. Ag.
Sargassum polyphyllum J. Ag.
Sphacelaria furcigera KÜtzing

CYANOPHYTA

Lyngbya semiplena (C. Ag.) J. Ag.
Microcystis sp.
Oscillatoria sp.

The Marine Algae Present in Turtle Gut Samples Collected in the Hawaiian Islands by George H. Balazs, Hawaii Institute of Marine Biology; Algae Identified by Dennis J. Russell, March 1980

GB-501 June 79	Percent of Sample
Gelidiella acerosa	80% Connally Lanai 1st stomach
Amansia glomerata	5
Acanthophora spicifera	10
Pterocladia sp.	2
Codium edule	3
Colonial animal (ascidian ?)	trace

GB-502 June 1979 Connally Lanai 2nd stomach	
Gelidiella acerosa	30
Codium arabicum	40
Amansia glomerata	10
Codium edule	15
Acanthophora spicifera	5
Colonial animal	trace

GB-503 June 1979 Rutka 1st stomach	
Codium edule	90
Pterocladia capillacea	1
Amansia glomerata	trace
Codium arabicum	9
Plant fibers	trace
Cartilagenous animal tissue	trace
Colonial animal	trace
Foliose rhodophyte	trace

GB-504 June 1979 Rutka 2nd stomach	
Codium edule	90
Gelidiella acerosa	3
Amansia glomerata	3
Ulva fasciata	1
Black colonial animals (4 lumps)	1

GB-505 June 1979 Rutko - small intestine

Gelidiella acerosa	1
Codium edule	75
Codium arabicum	24
Ulva reticulata	trace
Pterocladia sp.	trace
Ulva fasciata	trace
Achrochaetium (on Codium)	trace
Black colonial animals	trace

GB-506 July 1979 Bellows torso 1st stomach

Amansia glomerata	50
Codium edule	3
colonial animals	2
Silicate sponge (on Amansia)	45

GB-507 July 1979 Bellows torso 2nd stomach

Amansia glomerata	100
Membranous animal material	trace

GB-508 FG Oct 1979 mortality 1st stomach

Codium reediae	45
Ulva fasciata	45
Gracilaria coronopifolia	5
Acanthophora spicifera	3
Hypnea cervicornis	2
Cladophora sp.	trace
Ulva reticulata	trace
Grateloupia filicina	trace
Animal tissue (skin?)	

GB-509 FG Oct 1979 Mortality 2nd stomach

Ulva fasciata	80
Ulva reticulata	10
Ulva rigida	10
Gracilaria coronopifolia	trace

GB-510 Bellow focal recoveries 5 Sept 1979

Halophila ovalis (rhizomes)	100
Animal hairs (human?)	trace
Skin? (gray)	trace
Cotton fibers	trace
(generally on-descript pieces)	

Bellows fecal Recoveries 9/5/79 ↓

GB-511	
Halophila ovalis (rhizomes)	trace
Codium phasmaticum	90 (combined)
Codium edule	
Halophila ovalis blades etc.	10
Dictyota sp.	trace
GB-512	
Halophila ovalis	50
Codium arabicum	50
Animal hair (stiff, black)	trace
GB-513	
Codium arabicum	50
Halophila ovalis	50
Ulva fasciata	trace
(sample badly digested)	
GB-514	
Halophila ovalis (rhizomes)	50
Codium phasmaticum	50 (combined)
Codium arabicum	
Brown algal fragment	trace
Bryozoan	trace
Hairs	trace
Blue plastic ? skin ?	trace
GB-515	
Halophila ovalis (rhizomes)	10
Codium arabicum	90
Ulva fasciata	trace
Blue skin ?	trace
GB-516	
Codium arabicum	50
Halophila ovalis (rhizomes)	50
Amansia glomerata	trace
Hair	trace
(Badly digested)	

Bellows fecal Recoveries 9/5/79 ↓

GB-517

Codium sp. (digested)	60
Halophila ovalis (rhizomes)	30
Ulva fasciata	5
Plastic sheet	trace
Hair	trace
Detritis	5

GB-518

Codium sp. (digested)	50
Ulva sp. (digested)	50

GB-519

Halophila ovalis (rhizomes)	50
Codium sp. (digested)	50
Amansia glomerata	trace
Hair	trace

GB-520

Halophila ovalis (rhizomes)	70
Codium sp. (digested)	20
Feather quill	10
Ulva sp. (digested)	trace

GB-521

Halophila ovalis (rhizomes)	45
Sargassum echinocarpum	45
Codium phasmaticum	10
Codium sp. (digested)	trace
Feather	trace
Hair	trace

There is still a lot of cytoplasm in the Codium filaments, but the outer portions of the filaments have lost most of the characteristic features needed for positive identification to species.

GB-522

Codium arabicum	99 (combined)
Codium phasmaticum	
Round worm associated with Codium	
Coarse black hair	trace

Bellows fecal Recoveries 9/5/79 ↓

GB-523

Codium phasmaticum	90
Codium sp. (digested)	10
Polysiphonia sp.	trace

GB-524

Codium sp. (digested)	95
Ulva fasciata	5
Fragments, detritis	

GB-525

Codium sp. (digested)	90
Amansia glomerata	5
Halophila ovalis (rhizome)	5
Feather	trace
Hair	trace

GB-526

Codium phasmaticum	40 (combined)
Codium sp. (digested)	
Terrestrial grass	20
Halophila ovalis (rhizome)	20
Ulva fasciata	20
Ulva rigida	trace

GB-527

Codium sp. (digested)	75
Ulva fasciata	25
Terrestrial grass	trace
Sample badly digested	

GB-528

Codium sp. (digested)	90
Amansia glomerata	trace
Gnarled mass of tissue	10

GB-529

Halophila ovalis (rhizome)	70
Codium arabicum	20
Ulva rigida	5
Grateloupia hawaiiana	5
Dictyota divaricata	trace
Hair	trace

Bellows fecal Recoveries 9/5/69

GB-530

Sheet of plastic	75
Ulva rigida	20
Codium sp. (digested)	5
Halophila ovalis (rhizomes)	trace
Hair	trace

GB-531

Amansia glomerata	50
Codium phasmaticum	50
Codium sp. (digested)	trace

GB-532

Codium arabicum	95 (combined)
Codium phasmaticum	
Halophila ovalis (rhizome)	3
Amansia glomerata	1
Grateloupia filicina	1
Cartilagenous material	

GB-533 (Reef Sample)

Acanthophora spicifera
Asparagopsis taxiformis
Centroceras clavulatum
Ectocarpus breviarticulatus
Enteromorpha tubulosa
Grateloupia hawaiiana
Hypnea cervicornis
Hypnea chordacea
Hypnea musciformis
Sargassum echinocarpum
Spyridia filamentosa
Ulva fasciata

This looks like a Kaneohe Bay sample, if you collected it from some other bay on Oahu or from another island the exotics it contains would be very important records.

Received 4/7/80

List of the algae in samples GB-501 to GB-533

CHLOROPHYTA

Codium arabicum Kützing
Codium edule Silva
Codium phasmaticum Setchell
Codium reediae Silva
Codium sp.
Enteromorpha tubulosa Kützing
Ulva fasciata Delile
Ulva reticulata Forsskal
Ulva rigida C.Ag.
Ulva sp.

SEAGRASS

Halophila ovalis (R. Br.) Hook

PHAEOPHYTA

Dictyota divaricata
Dictyota sp.
Ectocarpus breviarticulatus J. Ag.
Sargassum echinocarpum J. Ag.

RHODOPHYTA

Acanthophora spicifera (Vahl) Boerg.
Acrochaetium sp.
Amansia glomerata C. Ag.
Asparagopsis taxiformis (Delile) Coll. and Harvey
Centroceros clavulatum (C. Ag.) Montagne
Gelidiella acerosa (Forsskal) Feldmann and Hamel
Gracilaria coronopifolia J. Ag.
Grateloupia filicina (Wulfen) C. Ag.
Grateloupia hawaiiana Dawson
Hypnea cervicronis J. Ag.
Hypnea chordacea J. Ag.
Hypnea musciformis (Wulfen) C. Ag.
Pterocladia capillacea (Gmelin) Bornet
Pterocladia sp.
Spyridia filamentosa (Wulfen) Harvey

Algae from Chelonia mydas stomach

Collected at French Frigate Shoals, III-1976,

by George Balazs

Det. by M. S. Doty, IV-1976, whose herbarium numbers appear at the left below.

BROWN
31561. Turbinaria ornata (Turner) J. Agardh.

Sterile and free of epiphytes. Composimg about 45 per cent of the contents.

RED
31562. Spyridia filamentosa (Wulfen) Harvey.

Sterile. Composing about 45 per cent of the contents.

Red
31563. ?Gracilaria n. sp. ~~species~~

Cystocarpic. Forming about 9 per cent of the contents.

RED
31564. Ceramium sp.*

BLUE-GREEN
31565. Microcoleus lyngbyaceus (Kuetzing) Thuret.*

RED
31567. Polysiphonia sp.*

Tetrasporic.

BROWN
31568. Sphacelaria tribuloides Meneghini. short, little *

31569. Roschera sp.*

* dissecting scope needed for 1.D.'s, However grows in clumps in wild

New records of the introduced marine alga Hypea musciformis (Wulfen) J. Ag. (Rhodophyta: Gigartinales) in Hawaii

by

Dennis J. Russell, ~~and~~ George Balazs and Bill Magruder (?)

This will be re-written
It's just a start.
R

INTRODUCTION

Abbott (1987) reported on approximately six alien marine algae that have been introduced to Hawaii since 1950. The species of concern to Hawaiian residents at the time she wrote this article was Hypnea musciformis, an alga native to the Caribbean and tropical Atlantic, but which was just recently introduced to Hawaii. The first alien alga recognized in Hawaii, was Acanthophora spicifera (Vahl) Boerg. It was introduced in about 1954 from Guam (Doty, 1961) and spread quickly to most of the Hawaiian islands by 19--. Also, during the early 1970s several species were introduced to Oahu for commercial and experimental purposes (Doty, 1988; Glenn and Doty, 1990). Two ecotypes of Eucheuma isiforme (C. Ag.) J. Ag. and Gracilaria tikavahiae McLachlan were introduced to Hawaii in from southern Florida (Russell, 1991) and H. musciformis probably came in with E. isiforme thalli in January 1974. All of these species are valued for their agar or carrageenan production and are farmed in other parts of the world (Dawes, etc.). (a sentence or two about Hypnea's commercial worth)

Little work has been published on the ecological consequences of these introductions, in spite of the inevitable

competition by some of them with native algae and the potential introduction of parasites from their place of origin. (tell about 2-3 publications on their ecology)

Studies in Hawaii about Hypnea species (Mshigeni 1977 etc.)

ORIGIN AND DISTRIBUTION

On 1976? H. musciformis began showing up in sea turtle stomach samples and from the reefs where sea turtles were recovered. This report summarizes what we have found concerning the spread of H. musciformis in Hawaii since its introduction.

A. Summary of occurrence in sea turtle research

1. Where and when (all data)
2. Amounts in turtles %
3. Amounts on reefs %
4. Observations

B. Summary of herbarium collections records

C. Observations and conclusions

(glean more information from any articles published about Hypnea musciformis in Hawaii or in the Caribbean)

List of Locations of Hypnea musciformis from Turtle Samples

	ID#	Location	Source	Date
1 x	GB-29	Kaneohe Bay, Oahu	turtle	28 Oct 77
2 x	GB-533	Bellows, Oahu	rocky shore	5 Sep 79
	GB-601	Bellows, Oahu	capture net	4 Jan 80
	GB-755	Bellows, Oahu	capture net	13 May 80
	GB-758	Bellows, Oahu	capture net	14 May 80
	GB-1041	Lilipuna, Kaneohe, Oahu	dead turtle	16 Jul 80
	GB-1042	Lilipuna, Kaneohe, Oahu	dead turtle	16 Jul 80
	-------	Kawela Bay, Oahu	dead turtle	28 Mar 85
	-------	Punaluu, Oahu	algal drift	19 Mar 85
	-------	Kuliouou, Niu Valley, Oahu (Kuliouou)	algal drift	4 Apr 85
3	-------	Kahului Harbor, Maui	rocky shore	5 May 85
	-------	Kahaluu, Kaneohe Bay, Oahu	dead turtle	3 Jun 85
	GB-8464	Kahului ~~Harbor~~ Bay, Maui	live turtle	17 Jun 85

-------	Kaneohe Bay, Oahu	dead turtle	22 Jun 85
-------	Airport Lagoon Drive, Oahu	dead turtle	13 Jul 85
4 x GB-8514	Shipwreck Beach, Kuahua, Lanai	live turtle	16 Jul 85
-------	Kaneohe Bay, Oahu	dead turtle	14 Aug 85
-------	Haleiwa Harbor, Oahu	dead turtle	26 Mar 86
-------	Sand Island, Oahu	dead turtle	-- Mar 86
-------	Kahaluu, Oahu	dead turtle	27 Jun 86
-------	Kaneohe Bay, Oahu	dead turtle	19 Jun 86
-------	Kaneohe Bay, Oahu	dead turtle	13 Sep 86
-------	Kailua Bay, Oahu	dead turtle	12 Jan 87
-------	Kaneohe Bay, Oahu	dead turtle	27 Jan 87
#3448	Kaneohe Bay, Oahu	drown turtle	11 Mar 87
-------	Mokuleia, Oahu	dead turtle	5 Sep 87
-------	Kualoa Beach, Oahu	dead turtle	17 Aug 87
-------	Mauanalua Bay, Oahu	dead turtle	2 Jun 87

7	#9874	Palaau, Molokai	dead turtle	13 Jul 88
	-------	Kahala Beach, Oahu	dead turtle	21 Feb 88
	-------	Kahuku, Oahu	dead turtle	18 Sep 88
	-------	Kailua Bay, Oahu	dead turtle	27 Apr 89
	-------	Kaneohe Bay, Oahu	dead turtle stomach	8 Oct 89
	-------	TURTLE Bay, Oahu Location (?) (Turtle Bay = Kahuku Point)	Dead turtle from (?)	1 Nov 89
	-------	Location (?)	(?)	15 Apr 90 X
	-------	Chun's Reef (Location ?) NORTH SHORE OF OAHU	dead turtle stomach	8 Jul 90
	-------	Haleiwa, Oahu	dead turtle stomach	10 Jul 90
	N490	Kaneohe Bay Location (?)	Live turtle Stomach flush (?)	3 Aug 90
	N491	Kaneohe Bay Location (?)	" " (?) " "	3 Aug 90
	-------	Kailua Beach Park, Oahu	dead turtle stomach	4 Aug 90
	-------	Castle Point, Kailua, Oahu	dead turtle stomach	20 Aug 90
	-------	Waikane, Kaneohe Bay, Oahu	dead turtle stomach	6 Sep 90
	-------	Laenani Beach Park Oahu (Kaneohe Bay)	dead stomach turtle	24 Sep 90

Dennis - my records show a 4/13 and a 4/17 90. No "45" was anything else written on the card?

-------	Kahaluu, Kaneohe Bay Location (?) Hiriam Fong	dead turtle stomach	27 Sep 90
-------	Kaneohe Bay ~~RAMO (Location ?)~~	dead turtle stomach	30 Oct 90 X
-------	Kaneohe Bay (~~Buckmaster~~ - Location ?)	dead turtle stomach	13 Nov 90 X
-------	Kailua Bay, Oahu	dead turtle	14 Nov 90
Z227(A)	Waikiki, Oahu	dead turtle	17 Dec 90
Z227(B)	Waikiki, Oahu	dead turtle	17 Dec 90
N741	Waikiki, Oahu	stomach flush live turtle	15 Mar 91
N844	Waikiki, Oahu	" " live turtle	26 Apr 91
N846	Kaneohe Bay, Oahu	" " live turtle	29 Apr 91
-------	Kahaluu ~~(Preble - Location ?)~~ Kaneohe Bay	dead turtle stomach	January 12, 1991 ~~1 Dec 91~~ X

SAME TURTLE (Z227(A) and Z227(B))

School of Natural & Mathematical Sciences

Seattle Pacific University
Seattle, Washington 98119
Phone: (206) 281-2140

George Balazs
NOAA National Marine Fisheries Service
SWFC Honolulu Laboratory F/SWC2
2570 Dole Street
Honolulu, HI 96822-2396

15 October 1991

Dear George,

I received the samples from Eve Clute (Lahaina) and wrote a letter to her (copy enclosed). The Safe Solutions group has a number of interesting people associated with it, so I have taken the chance of, perhaps enlisting their help in monitoring the Hypnea musciformis distribution and spread. It will be interesting to see what they do next. Anything information they send me will, of course, have to be verified by a professional, so don't worry, I am not going to put hearsay into a publication.

Although the manuscript does have data gaps in it I am progressing and will have a draft ready to send to you soon. I have too, since this is part of my sabbatical justification!

The samples from twenty necropsies arrived and I hope to find more H. musciformis in them. I'll work with them this week. Thank you for keeping me informed with articles like "Turtle Tag", etc. from your local news media, it really give me confidence when talking to my colleagues in Hawaii.

Sincerely,

Copy

Eve Clute
Safe Solutions
P.O. Box 11634
Lahaina, Maui, Hawaii 96761

15 October 1991

Dear Eve,

George Balazs of the National Marine Fisheries Service sent me the samples of algae (limu) that you mailed to him for identification, plus a copy of the letter of 10 Sep 1991 that you wrote him. I am a consultant on the Sea Turtle Recovery Team and it is my job to identify the algae present in sea turtle stomach samples. He gave the limu you sent for identification to me as he would his own samples. My Ph.D. training and degree is from the University of Hawaii, primarily in the area of limu ecology and specifically in the ecology of those limu species (alien seaweeds) introduced to Hawaii from abroad. These are the identifications and a brief description of each I made from your samples:

*Acanthophora spicifera (coarse, spiney, yellow-brown to deep red or black colored seaweed)
Amansia glomerata (deep red leafy and curly seaweed)
Cladophora sp. (green slime algae as reported in Maui News 1 May 1991)
Gracilaria coronopifolia (ogo)
*Hypnea musciformis (fine, red seaweed with distinct small hooks among its branches)
Jania sp. (crunchy, calcified, pink, tufted seaweed)
Ulva fasciata (green tissue-like sea lettuce)
Ulva reticulata (green tissue-like, full of holes or netted sea lettuce)

*these two are alien species

Presently, George and I are writing a paper on the spread of Hypnea musciformis (present in five of the bags you sent). Many of the records of its spread from its primary place of introduction (Kaneohe Bay, Oahu) come from my collections, the Bishop Museum herbarium and sea turtle gut analysis. Upon attempting to write a paper on the spread of this introduced seaweed I find gaps in data collecting. One gap is that we have no records from Kauai, only a few from Lanai and only a few from Hawaii (the Big Island).

Copy

I looked at the list of members in your organization and wonder if you would, by chance be willing to enlist them to make specific collections of this one species (Hypnea musciformis) from Kauai, Lanai and Hawaii and/or report that it is not present at specific locations they may visit. Would you be willing to do this? It would be an excellent way for your people to become involved in helping us understand how this unwanted alien seaweed is spreading in Hawaii and help us understand its potential threat to Hawaii's reef ecology. I would acknowledge your contributions in my publications and papers presented at meetings as they indeed add to the study.

Simply collect only 1/4 cup of the seaweed with hooks (Hypnea musciformis), blot it dry so there is no liquid present, let it air dry for an hour, place it into a small ziploc bag along with the collection location, date, name and address of the collector and mail it to me.

Dr. Dennis J. Russell
Biology Department
Seattle Pacific University
Seattle, WA 98119

I have enclosed three photos of Hypnea musciformis showing the characteristic hooks, so your people will not waste their time sending me a lot of limu not relevant to this study. Thank you for your interest in Hawaiian limu ecology. I place great value on public interest in science and our environment.

Sincerely,

Dennis J. Russell

1991

Algae bloom topic of council meeting

Continued from Page A1

fished in West Maui waters all their lives, say they are catching fewer fish and the algae is fouling their nets.

Toronto visitor Ursula Keuper-Bennett, who has been visiting Maui to dive for 15 years, calls her area of Honokowai "algae central." Keuper-Bennett said she never saw algae like this here except in 1989, when a similar bloom occurred.

"You've got to wade through it" to get into the ocean, and then swim through algae, emerging draped with it after a dive, she said.

At Kaanapali, diver Pete Priedhorsky said, the stuff comes in a "green cloud," which drifts in and out with the currents and seems to get worse after a rain.

Tim Aardrup, who manages the rental equipment for Capt. Nemo's, said the algae is "hanging all over my rental gear" when it's returned to the shop. Like some other observers, Aardrup thinks the bloom is encouraged by construction along the coast between Honolua and Wahikuli.

There could be a cause-and-effect relationship between development and the appearance of algae, Abbott said, but as a scientist it's impossible to say that without doing a study.

"We haven't got any scientific studies with a control, and until you have that, you're just spinning your wheels," she said. "I don't know what's causing this."

Abbott said she was born on Maui and spent many childhood summers in Lahaina, when the paved road went only as far as Honokowai. She doesn't remember seeing masses of seaweed on the beach in those days, so there is a possibility things have changed with development, but that isn't a statement she can make with scientific assurance.

Such blooms happen in many parts of the world at different times, Abbott said, although the problem is not happening on other Hawaiian islands right now.

Asked whether the algae bloom could be related to the abundance of seaweed washing up on shores on other parts of the island, Abbott could not say. Historically, she said, seaweed did wash up on Kihei and Kahului beaches a century ago, and the question now is not whether such occurrences are normal but how much over normal the present situation is.

Abbott said divers can gather some "quick and dirty data" on the alage bloom if they will stake out a specific spot and tidal period and collect everything they can from that area on a regular basis, say every two weeks. If they dry and weigh the collected seaweed and document it, divers can begin to scientifically monitor the bloom, she suggested.

The state Health Department's ocean water testing section has not learned anything new since it began watching the algae bloom last spring, supervisor Eugene Akazawa said.

Lack of resources to study the bloom is the major limiting factor for the state, Akazawa said. The state is hiring a new staff member to help the single person who now does all water quality testing for the state in Maui County, and an Oahu person may be assigned to monitor Molokai and Lanai.

With that additional help, the state may be able to do more offshore testing to supplement its existing program, Akazawa said.

Such routine data collection may be useful in eventually understanding the algae problem, but "it's not going to give us immediate answers," Akazawa said.

The literature on algae says warmth, sunshine, high nitrogen, phosphorus or runoff are conducive to its growth, Akazawa said. The same algae is found elsewhere in island waters, but is not out of control as it is off Maui.

1991

Without scientific study, algae bloom will stay a mystery

Council panel meets Tuesday with experts

By JILL ENGLEDOW
Staff Writer

WAILUKU — The green and growing algae infesting West Maui waters will be the topic of discussion at a County Council Public Works Committee meeting Tuesday morning.

The meeting will convene at 9 a.m. in the Council Chambers.

Committee Chairman Pat Kawano has invited a number of experts to attend the meeting to discuss the algae and offer suggestions on what to do about it. One visitor, Bishop Museum marine botanist William Magruder, will present his proposal for a study to survey the Cladophora bloom along the coast from Kaanapali to Kapalua.

If the council should find funds to support Magruder's study, it would be the first time any official agency has done so.

"No one has put their money where their mouth is," University of Hawaii botanist Dr. Isabella Abbott said.

From a scientist's point of view, until an extensive and probably costly study of the problem is done, there can be no definite answers about where it comes from and what to do about it.

Those who frequent Kaanapali coasts have opinions about what is causing the bloom, and they are emphatic about its effect on water quality, ocean life and the segment of the tourist industry that involves visitors who come here to dive or snorkel.

The algae is as bad if not worse than it was in the spring, when it first raised alarms among divers along the coast, diver Kevin McAfee said of the situation at Kapalua Bay. McAfee said the algae cuts visibility in the bay, which tends to collect the algae, and it is killing coral heads. He said he has photos of coral that was healthy in February or March but which is now dead because of the algae sticking to it.

McAfee said his neighbors, who have

See ALGAE BLOOM
on the last page of this section

Council sees how algae bloom is a problem

Continued from Page A1

1991

fearing it contains sewage.

Several other visiting and resident divers warned that the growth is ruining water quality, killing coral, threatening marine life and likely to do great damage to Maui's tourist trade.

They emphasized the necessity for immediate action because the bloom is growing fast and killing coral that will take decades to replace.

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OF NATURAL AND MATHEMATICAL SCIENCES SEATTLE PACIFIC UNIVERSITY (206) 281-2140 • SEATTLE, WASHINGTON 98119

10 December 1983

George Balazs
National Marine Fisheries Service
P.O. Box 3830
Honolulu, Hawaii 96812

Dear George,

These are the results of the latest identifications:

#7481 11-6 Mouth

Bryopsis pennata

#7481 11-6 Scrapings

Lyngbya semiplena

Polysiphonia tsudana

Urospora sp.

(possibly Pilinia rimosa Kützing)
Pilinia sp. (May be a new species. This genus has not been reported from the tropical pacific, as far as I know.)

Horizontal creeping rhizoids of irregular square cells, erect branches mostly not branched. Cells 15-30 µm thick, band-shaped, lobed chloroplast, lateral globose sporangia near the base. Erect branches tapering to a long cellular hair. See the drawing which I enclosed.

Microscopic round worms

#7485 11-6 Skin

Acrochaetium sp.

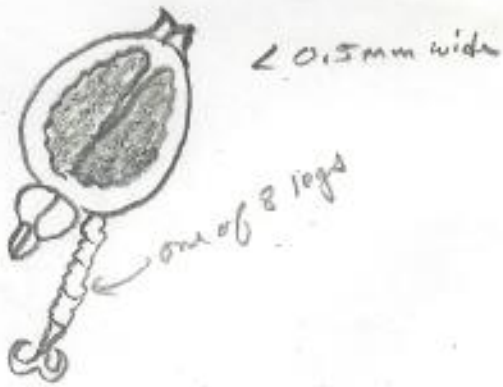
Polysiphonia tsudana

Lyngbya semiplena

Round worms

Amphipods

Black mites (see drawing)



#7495

(same as #7485 including the mites)

#7495 11-8 Stomach

Climacosphenia sp. (diatom) only one cell

Mostly squamous epithelial cells

Some filamentous bacteria

#7485 11-6 Mouth

Acrochaetium epiphitic on one of the ramuli of...

Caulerpa racemosa var. macrophysa (largest piece in the vial)

#7509 11-9 Fecal

75% Caulerpa racemosa var. uvifera

25% Bryopsis pennata

#7512 Skin

Barnacles

Urospora sp. (abundant)

Polysiphonia tsudana (abundant)

Pilinia sp. (abundant)

Acrochaetium sp. (abundant)

Cladophora sp. (30-50 µm diameter cells, only one small trace piece)

Dermocarpa sphaerica (epiphitic on Cladophora sp.)

Lyngbya semiplena (frequent)

(Cladophora sp. had unilateral branching from nearly every cell, branches were arched, and the alga was entirely procumbent)

#7512 11-10 Stomach

Mostly epithelial cells

One spherical component of Caulerpa racemosa var. uvifera

Several cells of Climacosphenia sp. (diatoms)

Oscillatoria filaments (trace)

#7565 11-13 Stomach

Bryopsis pennata

Amphipod

Epithelial cells

Pyxidicula (diatom cells)
Oscillatoria filaments

#7555 11-11 Mouth

Squamous epithelial cells

Flattened strands of "protein" (?) twisted into bundles.

Some bacteria filaments, sand grains, etc.

Blue-green algae (species ?)

Caulerpa racemosa var. macrophysa fragment, filled with starch grains and characteristic twists of cellulose strands.

#7560 11-12 Mouth scrap

Bryopsis pennata var. secunda

Three diatom cells (Pyxidicula sp.)

#7565 11-13 Scraping

Acrochaetium sp.

Polysiphonia tsudana

Sphacelaria tribuloides

Urosopora sp.

Lyngbya semiplena

Pilinia sp.

Foraminifera

DIVE # 14 11-5

Caulerpa serrulata (yellow-green with some saw-toothed blades)

Avrainvillea lacerata (gray-green flat blades)

Hydrocoleum lyngbyaceum (large, pink, slimey cushions)

Zonaria sp. (on a coral piece)

Polysiphonia sp. (trace)

DIVE # 13 11-4

Gelidium pusillum (all of it)

Ceramium sp. (trace)

USCG Confiscation 22 Aug '83 Stomach

Gelidium pusillum (99%)

Codium arabicum (1%)

Dictyota friabilis (trace)

HOGG Kailua Stomach 15 Oct '83

Hypnea cervicornis 80%

Caulerpa sertularioides 10%

Codium edule 5%

Dictyota acuteloba (trace)

Dictyopteris plagiogramme (trace)

Terrestrial grass (one piece)

Halimeda discoidea 5%

Summary:

CHLOROPHYTA
Avrainvillea lacerata J. Ag.
Bryopsis pennata Lamx.
Bryopsis pennata var. *secunda* (Harvey) Coll. and Harv.
Caulerpa racemosa var. *macrophysa* (Kützing) Taylor
Caulerpa racemosa var. *uvifera* (Turner) Weber von Bosse
Caulerpa serrulata (Forsk.) J. Ag.
Caulerpa sertularioides (Gmel) Howe
Cladophora sp.
Codium arabicum Kützing
Codium edule Silva
Pilinia sp. nov. (?)
or *Pilinia rimosa* Kützing
Urospora sp.nov. (?)

PHAEOPHYTA
Dictyopteris plagiogramme (Mont.) Vickers
Dictyota acuteloba J. Ag.
Dictyota friabilis Setch.
Sphacelaria tribuloides Meneghini
Zonaria sp.

RHODOPHYTA
Acrochaetium sp.
Ceramium sp.
Gelidium pusillum (Stackhouse) LaJolis
Hypnea cervicornis J. Ag.
Polysiphonia sp.
Polysiphonia tsudana Hollenberg

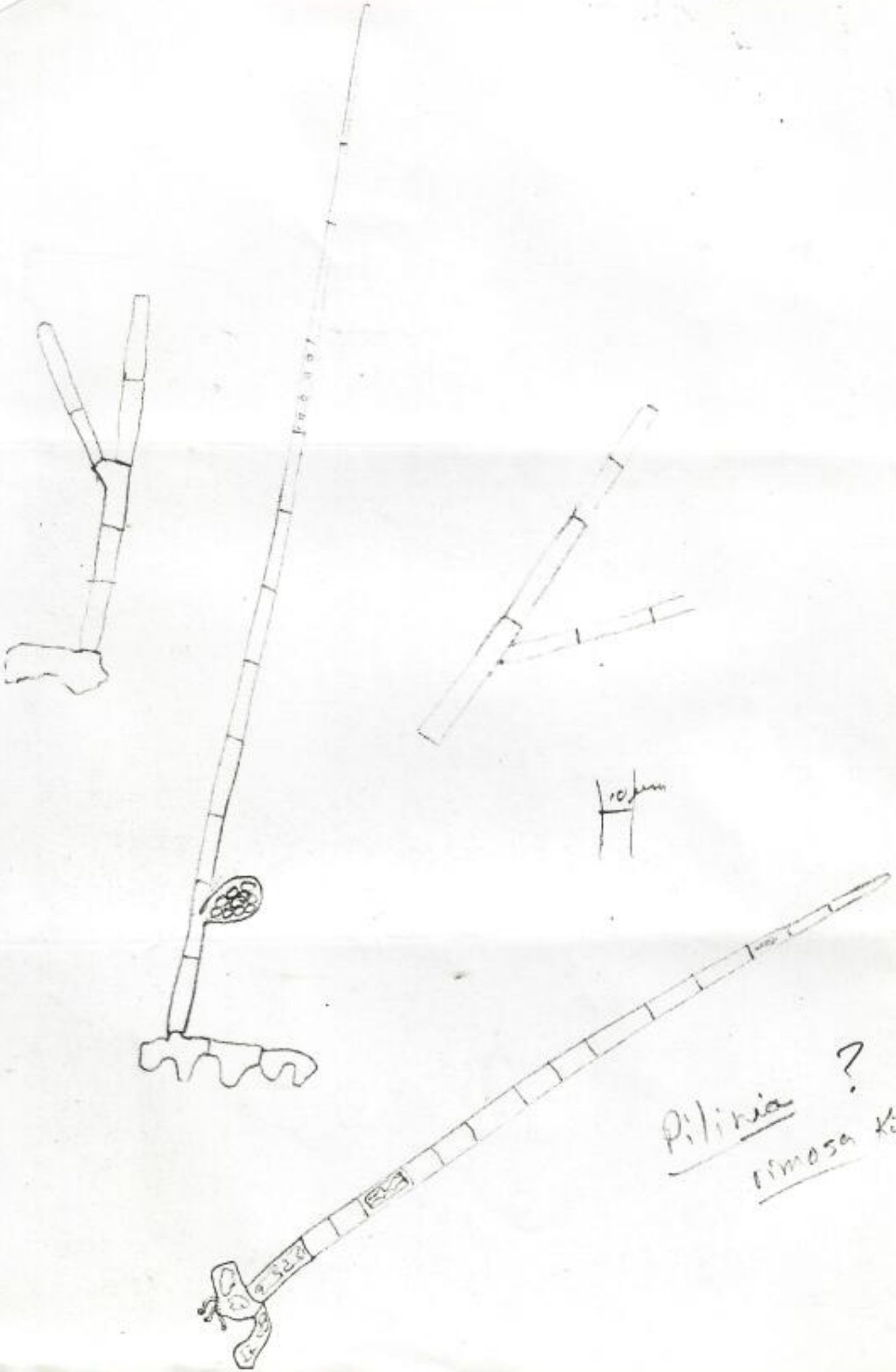
CYANOPHYTA
Dermocarpa sphaerica Setchell and Gardener
Lyngbya semiplena (C. Ag.) J. Ag.
Oscillatoria sp.

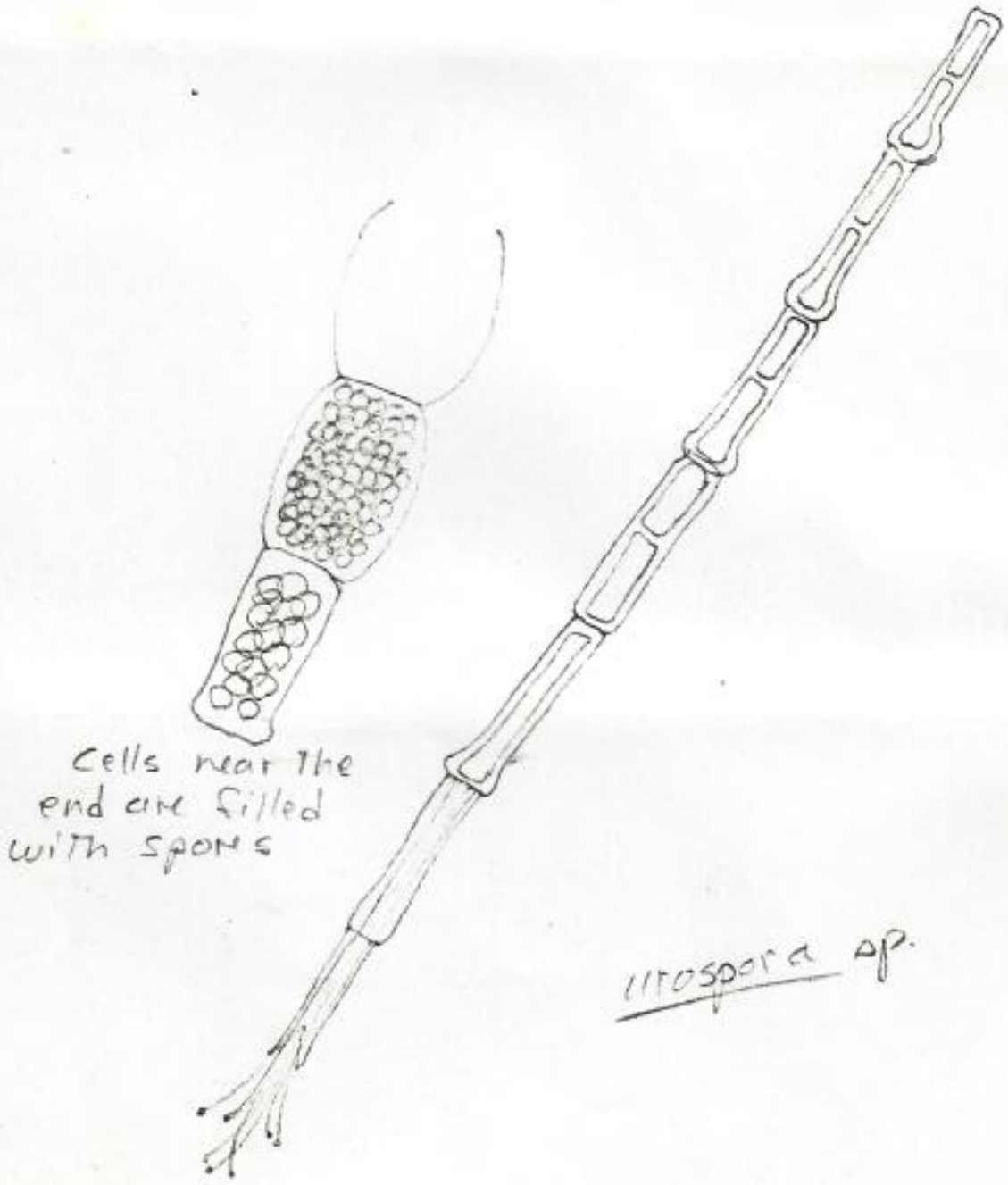
BACILLARIOPHYTA (diatoms)
Climacosphenia sp.
Pyxidicula sp.

George,

I am sending this list tonight so it will have a chance to get to you sooner. I will re-read your letters tomorrow and answer the questions in that letter. Then maybe I'll have a chance to look-up some of those references you asked about, and will have time to tally a bill. Our Hawaiian Marine Biology class is at a Methodist camp in Kailua this week (my "home" town). Maybe next year I will be in Hawaii.

Aloha,


1 cm
Pilinia ?
rimosa Kütz.


Cells near the end are filled with spores
Ulothrix sp.

NATURAL AND MATHEMATICAL SCIENCES

SEATTLE PACIFIC UNIVERSITY

(206) 281-2140 • SEATTLE, WASHINGTON 98119

25 December 1983

George Balazs
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96822

Dear George,

I have finished the "rush" order you wanted and have sent the results to you in another letter. The bill for this job of 25 vials of algae to be identified is $250.00. Please make the payment to:

Dr. Dennis J. Russell
Department of Biology
Seattle Pacific University
Seattle, Washington 98119

Thank you for this opportunity to work with you on your projects.

Sincerely,

Dennis J. Russell

Dennis J. Russell

NATURAL AND MATHEMATICAL SCIENCES SEATTLE PACIFIC UNIVERSITY (206) 281-2140 • SEATTLE, WASHINGTON 98119

25 December 1983

George Balazs
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96822

Dear George,

MERRY CHRISTMAS TO YOU AND YOUR FAMILY. I hope the report is coming along O.K. for you (or is it already finished?). I wish I could be of more help to you concerning the questions you asked me in your 16 October and 15 November letters. It may be too late now, but I still feel obligated just in case you got an extention or need to re-write a section or two.

1. How long can Bryopsis remain detached in drifts on the bottom and still appear green and alive?

Bryopsis is a coenocytic alga (multinuclear siphons or tubular filaments). When the branches are cut or torn the cytoplasm retracts from the cut ends to constrictions at the branch base where a plug is formed and the alga can build a protective wall and a new filament. Some algae, such a Codium can grow, push out beyond the cut ends and even re-attach themselves go the substratum (Ramus, 1972). Nearly all algae can remain alive for quite a long while and even grow while unattached. Their biggest restriction is fertilizer and many will not produce reproductive spores unless they are attached. (a minor problem for those algae that reproduce asexually by fragmentation) Finely branched filamentous algae such as Bryopsis have less problems surviving in the conditions you described, than do the heavier fleshy algae, since Bryopsis has much higher surface area to volume ratio. Ramus: Am. J. Bot. 59(5): 478-452.

Bryopsis could probably remain health and unattached indefinitely, as long as fertilizers were sufficient and currents weak enough to prevent their being washed away.

2. Do you know of good literature references (descriptions and ecology) for Bryopsis and Caulerpa we are finding here?

I would need some more time to collect better references on these species. The references exist, but I do not have them at my fingertips. Do you want me to collect them for you?

Stewart, W. D. P. 1974. Algal Physiology and Biochemistry. Botanical Monographs, Vol. 10, University of California Press, i-xi; 989 pp.

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Trono, G. C. 1968. The Taxonomy and Ecology of the Marine Benthic Algae of the Caroline Islands. Ph.D. dissertation University of Hawaii, i-viii; 387 pp.

3. How common is this Bryopsis in Hawaii?

Bryopsis is very common in Hawaii on piles, floats, boat hulls, buoys and rocks in still water, expecially harbors such as Kewalo Basin, Alawai Boat Harbor, Sand Island, Magic Island, and Coconut Island. It appears to inhabit still, diluted sea water, possibly with land run-off in it and possibly an elevated nutrient level. It can survive in habitats with a heavy silt load and can be found on silt covered rock where larger fleshy algae often cannot grow. I found quite a lot of Bryopsis on the reef-flat just to the right of the HIMB dock as you face Coconut Island. It is usually near shore in shallow water, but does occur in dark green clumps as large as tennis balls from time to time, in deeper (0.5 m) water. I would say Bryopsis is common in Hawaii, but usually in relatively small quantities, mixed with other algae, rather than in dense stands by itself.

4. Could you tell if the reef collection of Bryopsis I sent had been "grazed" by turtles or fish?

No, they appeared to be torn at the tops. Fish would probably crop this alga to within 1-5 mm of the rock, so maybe this indicates grazing by a bigger animal. I really cannot say yes.

5. What would Caulerpa racemosa look like that had been grazed?

It would probably look like a pile of thick spagetti (possibly a yellow-green from being sun bleached). The spagetti appearance would be due to the nearly naked horizontal rhizomes piled on each other as they spread across the rock. Grazing should not change the morphology of the erect branches (spheres, discs, clubs, etc.).

George, I hope this is not too late and will be of some help. If you wish to continue this research just let me know. I am rather interested in the green filamentous algae found on the skin of your turtles, especially the Pilinia sp. and the Urospora sp. These may be new species or at least not reported from the tropical Pacific. Right now I am working on a manuscript from my dissertation, and would not have time to research these algae, but could start a literature search and at least see what the possibilities might be with them. I would not begin research, report this to any meeting or publish anything without your permission. What do you say?

Again, my wife, son and I wish you, your wife and family the best of new years.

Aloha,

Dennis

Dennis J. Russell

SCHOOL OF NATURAL AND MATHEMATICAL SCIENCES

SEATTLE PACIFIC UNIVERSITY

(206) 281-2140 • SEATTLE, WASHINGTON 98119

George Balazs
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96822

21 January 1984

Dear George,

Thank you for the mailing labels, I'll send the specimens back to you as soon as possible. I am sorry about the confusion concerning the billing and payment. In a previous letter you said you had only $250 to spend on this job so that is what I wrote the bill for, later I got a PO from NOAA for $350 for the total and I wrote a new bill for them for that amount. I am really trying to avoid confusion and if there is any problem on your end let me know and we can straighten things out.

This past Christmas holiday I went to Vancouver B.C. to the annual Western Society of Naturalists meetings and came across some interesting material concerning Caulerpa toxins. I've enclosed the abstract for you so you can follow up on it if you desire.

I found a paper in my collection that is on Caulerpa that might interest you. It was in my notebook on species from the tropical Pacific that I use to identify the algae you send. I've enclosed it for you because it has ecological comments you might need and relates to atolls.

I will keep a sub-sample of the new species (?) and return the bulk of material to you so your collections will remain intact. Thank you for this opportunity and I'll let you know how things are going from time to time.

Aloha,

Dennis

Dennis J. Russell

Copy

25 December 1983

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National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96822

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Aloha,

Dennis J. Russell

The Maui News

Wednesday, August 14, 1991 Eight Sections, 62 Pages 35 Cents

The Maui News / MATTHEW THAYER photo

Diver Kevin McAfee examines the molted shell of a spiny lobster during a dive off the Honokowai coast. McAfee, a master dive instructor and president of Kapalua Dive Co., said the dense algae that has hit the coast between Honokowai and Kapalua has been devastating coral and other marine life. The thick algae floats with the currents and tides and clings to things like coral and the antennae of lobsters. He said much of the coral off Honokowai has been killed by the algae. "It's sad when you think of how long the stuff (coral) took to grow and this stuff is just killing it," McAfee said.

Council sees how algae bloom is a problem

Continued from Page A1

1991

fearing it contains sewage.

Several other visiting and resident divers warned that the growth is ruining water quality, killing coral, threatening marine life and likely to do great damage to Maui's tourist trade.

They emphasized the necessity for immediate action because the bloom is growing fast and killing coral that will take decades to replace.

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MATHEMATICAL SCIENCES SEATTLE PACIFIC UNIVERSITY (206) 281-2140 • SEATTLE, WASHINGTON 98119

6 November 1983

George Balazs
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96822

Dear George,

I am finished with the identifications of the algae you sent to me. These are the results:

7451 Oscillatoria sp. (very fine filaments, nothing else of algal form)

7461 Zonaria sp. ? (one small fragment with cells in rows and square groups like Zonaria, but the cells are too small, brown in color)

7466 Bryopsis pennata var. secunda (Harvey) Collins and Harvey

Polysiphonia sp. (fragment)

7473 Unidentifiable fibers (paper?), no algae present

7476 Bryopsis sp. (fragments only, probably B. pennata var. secunda)

WP Head 10-12

Caulerpa racemosa var. macrophysa (Kützing) Taylor (the larger piece)

Caulerpa racemosa var. uvifera (Turner) Weber von Bosse (the smaller piece)

WP Head 10-10

Bryopsis pennata var. secunda (Harvey) Collins and Harvey

Dive 11

Caulerpa serrulata f. angusta (Weber von Bosse) Taylor (the one that is twisted and that has teeth along only one margin of the blades)

Caulerpa serrulata (Forsskal) J. Ag. (Flat, toothed on both margins of blade)

Dictyota friabilis Setchell (epiphytic on Caulerpa)

The vials contained a great deal of squamous epithelial cells, probably from the throat of the turtle. I identified several species to variety or form because these are very distinct taxanomically and could be helpful in ecological work.

Thank you for the work, George. Aloha, Dennis

P.S. samples coming by separate mail

JOHNSTON ATOLL

From George Balazs to Dennis Russell
MAIL BY AIR 10/25/83

	SAMPLE CABEL		NOTE
1.	WP HEAD	10-12-83	collected from hard substrate along S. shore 5-10' depth, SEVERAL DIFFERENT GROWTH STAGES? EVIDENCE OF GRAZING BY TURTLES?
2.	WP HEAD	10-10-83	COLLECTED FROM TOP OF CORAL HEAD - WAVE-BREAK AT LOW TIDE. EVIDENCE OF GRAZING BY TURTLES? THEY ARE REGULARLY SEEN FEEDING THERE.
3.	x7451	10-4-83	EXTRACTED FROM TURTLES STOMACH WITH PLASTIC TUBE & FLUSHING. CAULERPA OR BRYOPSIS likely (?)
4.	x7461	10-5-83	" "
5.	x7473	10-7-83	" "
6.	x7476		" "
7.	x7466	10-5-83	" "
8.	DIVE	II	SPARCE GROWTHS COLLECT ON HARD SUBSTRATE
9.	DIVE	12 " 10-12-83	" "

MATHEMATICAL SCIENCES SEATTLE PACIFIC UNIVERSITY (206) 281-2140 • SEATTLE, WASHINGTON 98119

George Balazs
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96822

2 November 1983

Dear George,

Inclosed is the copy you sent to me of the Johnston Atoll study. I have included a few remarks, especially where you indicated, but generally do not find any serious flaws. Most of my marks are in red and on the back of a few pages. I hope they will be of some use. There could be much more literature included, but you are probably not looking for that kind of an approach.

Your samples came yesterday (1 November 1983) and it looks as if there will not be too great of a problem getting them back to you next week. Our biology faculty will be on Oahu this year at a camp in Kailua, near Lanikai. Ron Phillips will be the director and this year I will stay home with the family.

Aloha,

Dennis

ALGAE SAMPLES FROM JOHNSTON ATOLL
SENT TO DENNIS RUSSELL FOR ID
18 NOV 83

SAMPLE NO. & DESCRIPTION

1.	7481	SCRAPINGS from SKIN & SHELL
2.	7485	" " " "
3.	7495	" " " "
4.	7512	" " " "
5.	7565	" " " "
6.	7481	Particle found in mouth
7.	7485	" " " "
8.	7555	" " " "
9.	7560	" " " "
10.	7565	" " " "
11.	x 7495	Pumped from stomach or "crop"
12.	x 7512	" " " "
13.	x 7565	" " " "
14.	7509	RINSED PARTICLES from fecal pellet
15.	DIVE 13	Bottom sample
16.	DIVE 14	" "
17.	DIVE 15	" "