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April 13, 1988

Algae Identified from Kiholo Samples

#8701 Kiholo 10/87

<u>Valonia aegagropila</u>	80%
<u>Gelidium pusillum</u>	20
<u>Oscillatoria subtilissima</u>	Trace
<u>Polysiphonia tenuis</u>	Trace

#8702 Kiholo 10/87

<u>Gelidium pusillum</u>	90%
<u>Ulva fasciata</u>	10

#8704 Kiholo 10/88

<u>Gelidium pusillum</u>	100%
Terrestrial plant material	Trace

#8707 Kiholo 10/87

<u>Gelidium pusillum</u>	99%
<u>Jania capillacea</u>	1
<u>Oscillatoria subtilissima</u>	Trace
<u>Ceramium sp.</u>	Trace
<u>Herposiphonia nuda</u>	Trace
<u>Dictyota friabilis</u>	Trace
Black sand	

#8709 Kiholo 10/87

<u>Gelidium pusillum</u>	98%
<u>Dictyota friabilis</u>	1
Sponge	1
Black sand	

#8714 Kiholo 2/88 FECES

<u>Bryopsis sp.</u>	40%
<u>Gelidium pusillum</u>	40
Sponge	20
Diatoms	Trace

#8714 Kiholo stomach 2/88

<u>Gelidium pusillum</u>	85%
<u>Laurencia nidifica</u>	10
<u>Dictyota friabilis</u>	5
<u>Herposiphonia nuda</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace
One amphipod	

#8716 Kiholo 2/11/88

<u>Gelidium pusillum</u>	80%
Sponge	10
<u>Valonia aegagropila</u>	10
<u>Jania capillacea</u>	Trace
<u>Herposiphonia nuda</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace
Terrestrial leaf	Trace

#8720 Kiholo Stomach 2/88

<u>Gelidium pusillum</u>	99%
<u>Dictyota friabilis</u>	1
Diatoms	Trace
<u>Jania capillacea</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace
Sand and shell	
One ant	
One urchin spine?	

#8722 Kiholo Stomach 2/88

<u>Gelidium pusillum</u>	99%
<u>Hypnea sp.</u>	1
<u>Enteromorpha sp.</u>	Trace
<u>Acrochaetium sp.</u>	Trace
Diatoms	Trace
<u>Jania capillacea</u>	Trace
<u>Urospora sp.</u>	Trace
<u>Dictyota friabilis</u>	Trace
<u>Lyngbya sp.</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace
<u>Ceramium sp.</u>	Trace
One amphipod	
One hollow spine	

#8724 Kiholo Stomach 2/88

<u>Gelidium pusillum</u>	99%
<u>Laurencia nidifica</u>	1
<u>Amansia glomerata</u>	Trace
<u>Jania capillacea</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace

#8903 Kiholo Stomach 2/88

<u>Gelidium pusillum</u>	80%
<u>Valonia aegagropila</u>	20
<u>Acanthophora spicifera</u>	Trace
<u>Jania capillacea</u>	Trace
<u>Hypnea sp.</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace

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#8905 Kiholo Stomach 2/88

<u>Gelidium pusillum</u>	99%
<u>Dictyota friabilis</u>	1
<u>Laurencia nidifica</u>	1
<u>Ceramium sp.</u>	Trace
<u>Hypnea sp.</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace
<u>Jania capillacea</u>	Trace

#8909 Kiholo 2/88

<u>Gelidium pusillum</u>	99%
<u>Dictyota friabilis</u>	1
<u>Laurencia sp.</u>	Trace
<u>Oscillatoria subtilissima</u>	Trace
Terrestrial leaf	Trace
Sand	

#8911 Kiholo Stomach 2/88

<u>Gelidium pusillum</u>	99%
<u>Amansia glomerata</u>	1
<u>Dictyota friabilis</u>	Trace
<u>Ectocarpus indicus</u>	Trace
<u>Herposiphonia nuda</u>	Trace
<u>Jania capillacea</u>	Trace
<u>Polysiphonia sp.</u>	Trace
<u>Tolypocladia calodictyon</u>	Trace
Terrestrial grass	Trace

#1 Anahola, Kauai 10/7/87

<u>Amansia glomerata</u>	100%
<u>Ceramium sp.</u>	Trace
<u>Valonia aegagropila</u>	Trace
Sponge	Trace

#2 Anahola, Kauai 10/7/87

<u>Pterocladia capillacea</u>	80%
<u>Amansia glomerata</u>	20

Frank Parish, Stomach, Kailua 6/11/87

<u>Codium edule</u>	65%
<u>Codium arabicum</u>	20
<u>Amansia glomerata</u>	10
<u>Dictyosphaeria versluysii</u>	5

Stomach, Kaneohe 5/17/87

<u>Acanthophora spicifera</u>	60%
<u>Laurencia nidifica</u>	30
<u>Codium arabicum</u>	5
<u>Codium phasmaticum</u>	5
<u>Halimeda discoidea</u>	1
<u>Spyridia filamentosa</u>	1
<u>Gelidium pusillum</u>	Trace

#S-74.3 Hanauma Bay 10/17/87

<u>Halophila ovalis</u>	50%
<u>Pterocladia capillacea</u>	15
<u>Acanthophora spicifera</u>	20
<u>Amansia glomerata</u>	10
<u>Codium edule</u>	5
<u>Ceramium sp.</u>	Trace

Pupukea Stomach Sample 9/11/87

<u>Pterocladia capillacea</u>	98%
<u>Amansia glomerata</u>	1
<u>Codium edule</u>	1

#1 Mokuleia Entire Forestomach, 10/22/87 (sample discarded)

<u>Acanthophora spicifera</u>	60%
<u>Pterocladia capillacea</u>	30
<u>Amansia glomerata</u>	5
<u>Codium arabicum</u>	5

#2 Mokuleia Stomach, 10/22/87 (sample discarded)

<u>Pterocladia capillacea</u>	60%
<u>Amansia glomerata</u>	10
<u>Gelidiella acerosa</u>	10
<u>Acanthophora spicifera</u>	10
<u>Codium arabicum</u>	5
<u>Gelidiopsis variabile</u>	5
<u>Cladophoropsis luxurians</u>	Trace
<u>Dictyosphaeria versluysii</u>	Trace

#1 Forestomach 5/26/87

<u>Gelidiopsis variabile</u>	40%
<u>Amansia glomerata</u>	30
<u>Codium arabicum</u>	30
<u>Dictyosphaeria versluysii</u>	Trace

#2 Stomach 5/26/87

<u>Pterocladia capillacea</u>	90%
<u>Codium edule</u>	10

Mokuleia Army Beach Stomach Contents, 9/5/87

<u>Acanthophora spicifera</u>	30%
<u>Gelidium sp.</u>	30
<u>Gelidiella acerosa</u>	20
<u>Hypnea musciformis</u>	20
<u>Amansia glomerata</u>	Trace
<u>Bornetella sphaerica</u>	Trace
<u>Codium edule</u>	Trace

Kualoa Beach, Stomach, 8/17/87

<u>Acanthophora spicifera</u>	40%
<u>Hypnea musciformis</u>	40
<u>Caulerpa sertularioides</u>	10
<u>Gracilaria coronopifolia</u>	10

List of Species Identified in These Hawaiian Samples

CHLOROPHYTA

Bornetella sphaerica (Zanard.) Solms-Laubach
Bryopsis sp.
Caulerpa sertularioides (Gmelin) Howe
Cladophoropsis luxurians Gilbert
Codium arabicum Kützting
Codium edule Silva
Codium phasmaticum Setchell
Dictyosphaeria versluysii Weber van Bosse
Enteromorpha sp.
Halimeda discoidea Decaisne
Ulva fasciata Delile
Urospora sp.
Valonia aegagropila C. Ag.

RHODOPHYTA

Acanthophora spicifera (Vahl) Boerg.
Amansia glomerata C. Ag.
Ceramium sp.
Gelidiella acerosa (Forsskal) Feldmann and Hamel
Gelidiopsis variabile J. Ag.
Gelidium pusillum (Stackhouse) LaJolis
Gracilaria coronopifolia J. Ag.
Herposiphonia nuda Hollenberg
Hypnea musciformis (Wulfen) C. Ag.
Hypnea sp.
Jania capillacea Harvey
Laurencia nidifica J. Ag.
Polysiphonia tenuis Hollenberg
Spyridia filamentosa (Wulfen) Harvey
Tolypocladia calodictyon (Harv.) Silva

CYANOPHYTA

Lyngbya sp.
Oscillatoria subtilissima Kützting

PHAEOPHYTA

Dictyota friabilis Setchell
Ectocarpus indicus Sonder

SEAGRASS

Halophila ovalis (R. Br.) Hook

FLORIDA SAMPLES*

#9

Hypnea musciformis (Wulfen) C. Ag.
Dictyopteris plagiogramme (Mont.) Vickers
Callophyllis microdonta (Greville) Falkenberg
 Foliose red alga (?)

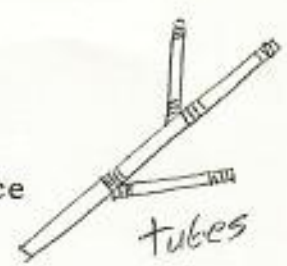
40%
 40
 20
 Trace



#10

Colonial tunicate
Codium isthmocladium Vickers
Hypnea musciformis
 Hydrazoan (animal colonies)

50%
 40%
 10
 Trace



#11

Gelidium crinale (Turner) Lam.
 Terrestrial grass
Dictyota sp.

90%
 10
 Trace

#12

Gracilaria cylindrica Boerg.

*Primary reference used for identification (Taylor, 1972)

George,

The Kiholo stomach samples had Lyngbya sp. and Oscillatoria subtilissima in them, but these species were attached to patches of skin. These are typical of external skin scrapings rather than stomach samples. Are the turtles preening themselves? and ingesting some of the skin flora?

When it comes to identifying Gelidium and Pterocladia species I have to go by vegetative characteristics most of the time. These genera are separated by how many ostioles are present in their cystocarps (1 or 2) and I seldom see female thalli. The vegetative characteristics are quite variable too. I am reasonably sure my identifications are accurate, but worry over every sample rich in Gelidium or Pterocladia. What I am suggesting is that these genera are very similar in appearance at times and would be the same food in the eyes of a turtle.

Concerning the Florida samples. All of our correspondence is in a notebook I keep, but somehow the list for these last Florida samples has been temporarily misplaced. I have the numbers, but not the locations. #9-12 correspond to the order given in that list. When I find it I will send it to you.

Last time you had 15 vials credit (prepayed). This job total was 25 vials. This means you owe payment for 10 samples.

Thank you for the opportunity to help with your sea turtle research.

Aloha,

Dennis Russell

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November 2, 1988

Algae Identified from Kiholo, Oahu

Kiholo Pond 6/88

Anacystis marina*(see my notes on this species) 99%
=(Microcystis spp.)
=Microcystis litoralis (possibly)
Oscillatoria margaritifera* 1

Reef #1 Kiholo 6/88

Alsidium sp.* 60%
Gelidium pusillum 40

Reef #2 Kiholo 6/88

Polysiphonia tenuis 50%
Tolypocladia calodictyon 50
Diatoms Trace
Boodlea sp. Trace
Chondria tenuissima Trace

#3317a Kiholo tag scraping 4/28/88

Sphacelaria sp.
Achrochaetium sp.*
Chaetomorpha antennina
Centroceros clavulatum

Foraminifera
Clam

#3317b Kiholo posterior ventral carapace scraping

Chaetomorpha antennina 90%
Achrochaetium sp. 10
Diatoms Trace

Black spider mite
Black sand

#3778 Kiholo stomach

Gelidium pusillum 99%
Alsidium sp. 1
Jania capillacea Trace
Micrococcus sp. Trace

*see drawings attached

#8704 Kiholo stomach 6/88

<u>Enteromorpha plumosa</u>	Trace
<u>Gelidium pusillum</u>	99%
<u>Microdictyon japonicum</u>	1
<u>Jania capillacea</u>	Trace
<u>Scytonema pascheri</u>	Trace

Black sand

#8707 Kiholo stomach

<u>Acanthophora spicifera</u>	99%
<u>Gelidium pusillum</u>	1

#8716 Kiholo stomach 6/88

<u>Microdictyon japonicum</u>	50%
<u>Gelidium pusillum</u>	45
<u>Alsidium sp.</u>	5
<u>Ceramium sp.</u>	Trace
<u>Achrochaetium sp.</u>	Trace
<u>Halophila ovalis</u>	Trace

Two spines

One snail

#8924 Kiholo stomach 4/27/88

<u>Turbinaria ornata</u>	100%
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Amphipod

#8927 Kiholo stomach 4/27/88

<u>Gelidium pusillum</u>	50%
<u>Alsidium sp.</u>	50
<u>Oscillatoria sp.</u>	Trace
<u>Scytonema pascheri</u>	Trace

Sand

#8929 Kiholo stomach 4/27/88

<u>Gelidium pusillum</u>	90%
<u>Alsidium sp.</u>	6
<u>Hypnea sp.</u>	2
<u>Jania capillacea</u>	2
<u>Microcoleus sp.</u>	Trace

#8939 Kiholo stomach 4/28/88

<u>Gelidium pusillum</u>	50%
<u>Dictyota friabilis</u>	40
<u>Padina japonica</u>	10
<u>Ectocarpus sp.</u>	Trace
<u>Microdictyon japonica</u>	Trace

Snail

Sand

#8941 Kiholo stomach 4/28/88

<u>Alsidium sp.</u>	Trace
<u>Ceramium sp.</u>	Trace
<u>Dictyota friabilis</u>	Trace
<u>Laurencia sp.</u>	Trace
<u>Microcoleus sp.</u>	Trace
<u>Padina japonica</u>	Trace

Amphipod

Maggot (?)

Terrestrial plant leaf material

#8943 Kiholo stomach

<u>Alsidium sp.</u>	Trace
<u>Gelidium pusillum</u>	Trace
<u>Lobophora variegata</u>	Trace
<u>Jania capillacea</u>	Trace
<u>Hypnea pannosa</u>	Trace
Foliose red algal germling	Trace

<u>Casurina equisetifolia</u> (terrestrial plant)foliage	Trace
Foraminifera	

#8945 Kiholo stomach 6/88

<u>Alsidium sp.</u>	90%
<u>Gelidium pusillum</u>	10
<u>Jania capillacea</u>	Trace
<u>Microcoleus sp.</u>	Trace

Snail

Sponge

#8947 Kiholo stomach

<u>Gelidium pusillum</u>	90%
<u>Alsidium sp.</u>	10
<u>Microdictyon japonicum</u>	Trace

Tree bark	Trace
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SUMMARY

RHODOPHORA

Acanthophora spicifera (Vahl) Boerg.
Achrochaetium sp.
Alsidium sp.
Centroceros clavulatum (C.Ag.) Mont.
Ceramium sp.
Chondria tenuissima (Lyngbye) J. Ag.
Gelidium pusillum (Stackhouse) LaJolis
Hypnea pannosa J. Ag.
Hypnea sp.
Jania capillacea Harvey
Laurencia sp.
Polysiphonia tenuis Hollenberg
Tolypocladia calodictyon Silva

CHLOROPHYTA

Boodlea sp.
Chaetomorpha antennina (Bory) Kuetz.
Enteromorpha plumosa Kuetz.
Microdictyon japonicum Setchell

SEAGRASSES ETC.

Halophila ovalis (R. Br) Hook
Casurina equisetifolia L.

PHAEOPHYTA

Dictyota friabilis Setchell
Ectocarpus sp.
Lobophora variegata (Lamx.) Womersley
Padina japonica Yamada
Sphacelaria sp.
Turbinaria ornata (Turn.) J. Ag.

CYANOPHYTA

Anacystis marina (Kuetz.) Drouet & Daily
=Microcystis spp.
=(possibly Microcystis litoralis (Hansg.) Fosti
Microcoleus sp.
Oscillatoria margaritifera Kuetz.
Oscillatoria sp.
Scytonema pascheri Baradwaja

George,

I spent more time than usual on some of these samples, because of the tiny red fragments. Notice the drawings I've included to describe Alsidium sp., I still do not have a species for this genus, but at least it will be recognized without problems in future samples.

Also, note the description of Anacystis marina and Drouet's key. He put dozens of Microcystis species into synonymy with Anacystis, many being quite vague. Just be aware that what you have in the pond is a tiny blue-green cyanophyte, originally called Microcystis (probably M. litoralis), but now called Anacystis marina by many authors. That is probably the best I can do right now. Notice the key distinguishes two species by the characteristic of floating or not! A terrible characteristic. Blue-greens are noted for their high protein content, but some are also poisonous. Also, there were egg-like cells in the sample (48.0-55.9 um diameter).

I did not identify the diatoms to species, but they were mostly common epiphytes on algae or found in waters all the time. They were Melosira nummuloides (Dillwyn) Ag., Coscinodiscus marginatus Ehrenberg, Cocconeis scutellum Ehrenberg, Licmophora sp., Navicula sp., Surirella sp. and Pleurosigma sp. These are probably incidental to your study.

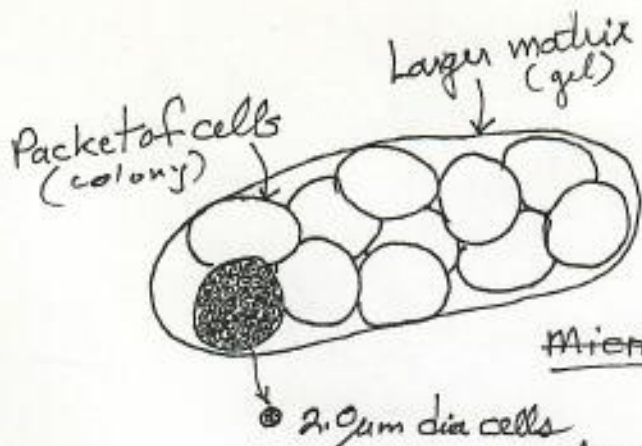
Thank you for the article with Anacystis in it. It helped. I am progressing on the next set of samples now. I did receive two POs for 25 samples each, you were 10 in dept, and with this report (17), it comes to $50 - 27 = 23$ credit. With this report you now have 23 samples to your credit.

Lew Consiglieri (EPA & NOAA) lives on the same street with me. He says he worked with you when he was in Hawaii a few years ago. Do you know him? I will be on Maui, at Camp Pecusa, Olowalu, from 10 December to 22 December, 1988, with a class. Sue and I have to return with them, however, and will not be stopping on Oahu for long. Have a great holiday, George. I will get the next set of identifications to you before long.

Aloha,

Dennis

Kiholo Pond
6/88



Microcystis litoralis (Hansq.) Forti

? = Anacystis cyanea (Kütz) Drouot & Daily

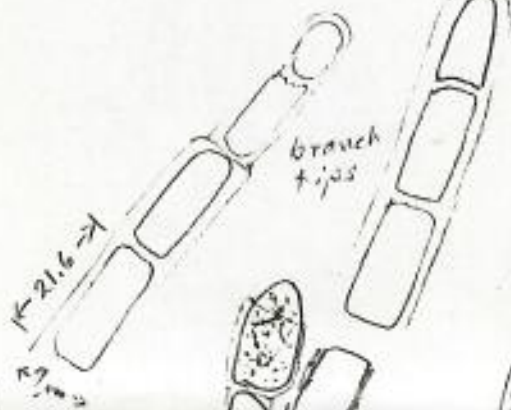
= A. marina (Kütz) Drouot & Daily



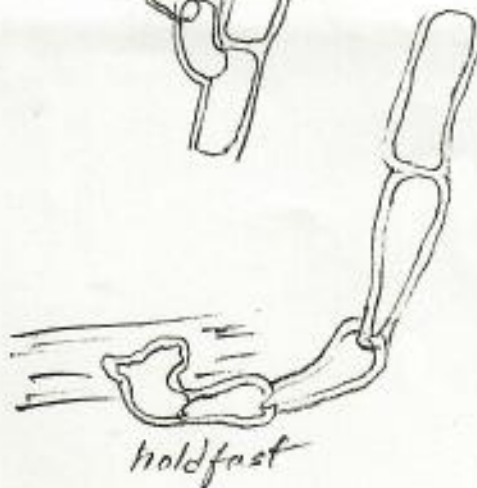
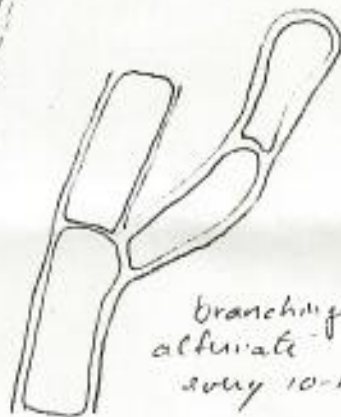
Oscillatoria margaritifera Kütz.

17.2um wide, Dark-blue-black color, single, straight

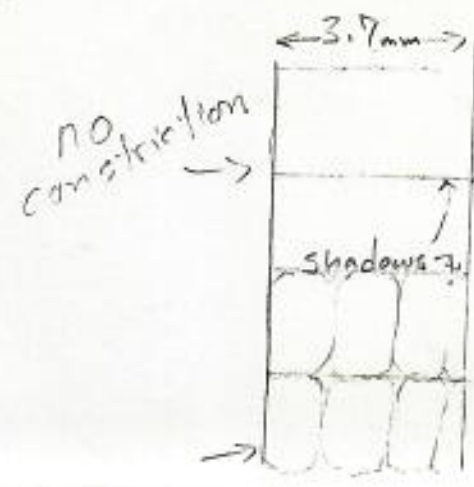
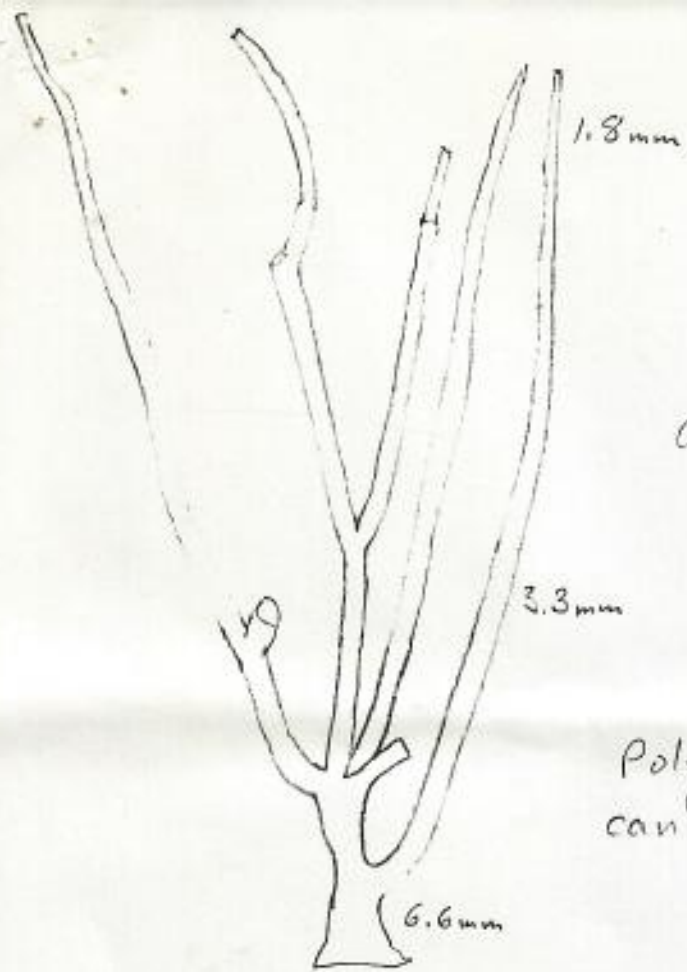
* 3317 B



short
branch
w/ spore
or gland



Achrochaetium sp.



Polysiphonous cells
can be seen in young tips

surface cells
10-20 μm dia.
cortical cells

Height

Alsidium sp.



X-section

10-11 pericentral cells
around a hollow center

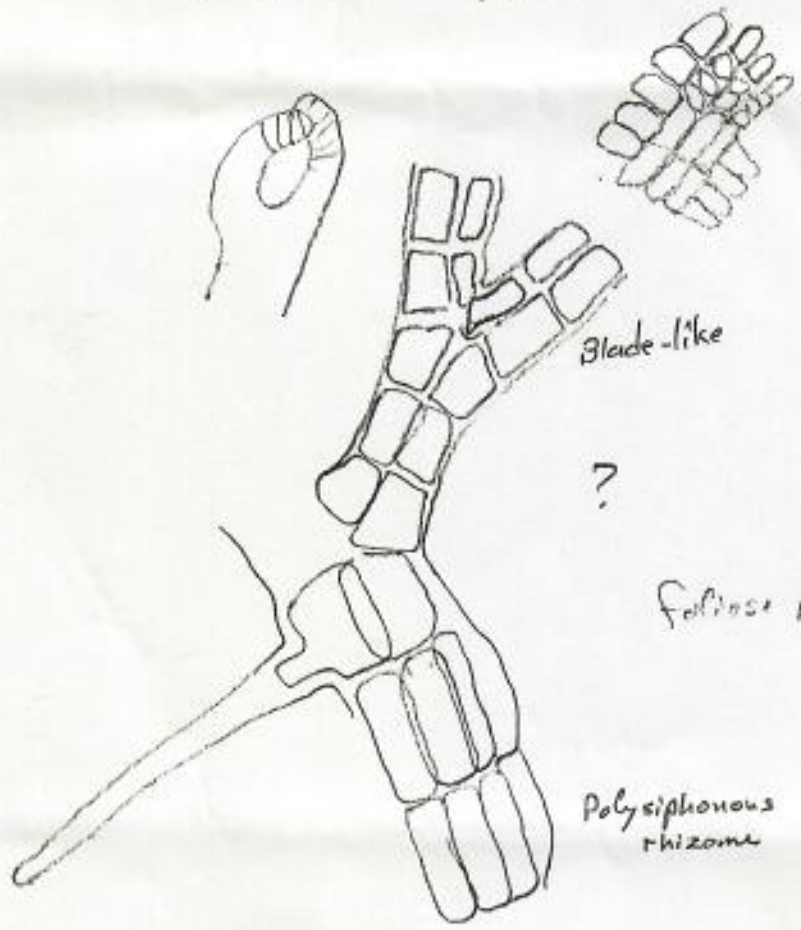
Tough, cartilaginous
thallus, difficult to
slice.

Alsidium

Kiholo * 8704



Scytonema pascheri Bharadwaja



Blade-like

?

Foliose Red Surrounding

Polysiphonous
rhizome

390

Butler University Botanical Studies

Volume XII

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REVISION OF THE COCCOID MYXOPHYCEAE

by

FRANCIS DROUET

and

WILLIAM A. DAILY

Address all communications with reference to papers to Butler University
Botanical Studies, Butler University, Indianapolis 7, Indiana, U.S.A.

Inst. Crypt. Horti Bot. Petropol. 2: 67. 1923. *Chroococcaceae* III. *Gloeocephalaceae-stereomitraceae* A. *Homosoglossae* 2. *Excavatae* a) *Distanter* Elenkin, loc. cit. 1923. *Gomphosphariaceae* Elenkin, Acta Inst. Bot. Acad. Sci. U. R. S. S., II, 1: 18. 1933. —Type genus: *Gomphospharia* Kütz.
Chroococcaceae III. *Gloeocephalaceae-stereomitraceae* B. *Heteroglossae* 2. *Tegumentocrassiores* Elenkin, Not. Syst. Inst. Crypt. Horti Bot. Petropol. 2: 68. 1923. *Gloeocephalaceae* Elenkin, Acta Inst. Bot. Acad. Sci. U. R. S. S., II, 1: 19. 1933. —Type genus: *Gloeocephala* Kütz.
Holopediaceae Elenkin, Acta Inst. Bot. Acad. Sci. U. R. S. S., II, 1: 19. 1933. *Bocksiaceae* Elenkin, loc. cit. 1933. —Type genus: *Holopedium* Lagerh.

The following family names have type species of their type genera for which no original specimens have been available to us for study:

Woronichiniaceae Elenkin, Acta Inst. Bot. Acad. Sci. U. R. S. S., II, 1: 18. 1933. —Type genus: *Woronichinia* Elenk.
Coelosphariaceae Elenkin, Acta Inst. Bot. Acad. Sci. U. R. S. S., II, 1: 18. 1933. —Type genus: *Coelospharium* Näg. (= *Coelocystis* Näg.).

Plantae uni—multi-cellulares, microscopicae vel macroscopicae, forma et magnitudine et ambitu diversae, libere in aqua natantes vel in stratis crescentes, cellulis sphaericis, discoideis, ovoideis, ellipticis, cylindraceutis, vel pyriformibus, unaquidque in duas cellulas-filias aequales dividente, unaquidque mox ab aliis cum gelatino vaginale se separante; reproductione a fragmentatione.

Most of the species of *Chroococcaceae* are capable of developing in various ways: as microscopic or macroscopic globular aquatic plants with homogeneous or lamellose matrices; as aquatic, subaerial, or aerial strata or cushions; or as free single cells where the sheath material has completely hydrolyzed. The cells, their methods of division and regeneration, and the arrangement of the cells in the plant are the chief means of distinguishing genera and species. Division of a cell into two equal daughter-cells is characteristic of the family.

Many of the unornamented coccoid and palmelloid *Chlorophyceae* have been described or transferred into this family at one time or another, even in recent years. *Palmogloea protuberans* (Sm. & Sow.) Kütz. is perhaps the most often placed here by mistake. Palmelloid flagellates and the primordia of *Ulotrichaceae*, *Chaetophoraceae*, *Ulvaceae*, and even *Trentepohliaceae*, especially where preserved in liquids, have often been interpreted as *Chroococcaceae*. The presence of chloroplasts, pyrenoids, starch, and cellulose walls should make the *Chlorophycean* affinities obvious. Likewise, *Porphyridium*, *Asterocystis*, and *Porphyra* spp. are sometimes mistakenly supposed to be *Chroococcaceae*. Spores of *Nostocaceae* and few-celled hormogonia of the smaller species of *Phormidium*, *Plectonema*, and *Scytonema* have been confused with members of this family. Bacteria and certain spores and cells of fungi also simulate these plants.

The measurements for cells noted in the keys and descriptions here are those generally encountered. Where successive divisions proceed at a rapid rate and enlargement at a slow rate, cells may be found which are smaller than those recorded here. With a reversal of these extremes, the largest measurements could be exceeded.

Key to genera:

1. Cells before division ovoid to cylindrical, longer than broad, each dividing in a plane perpendicular to the long axis 1. COCCOCHLORIS
1. Cells before division spherical, ovoid, discoid, cylindrical, or pyriform, never dividing in planes perpendicular to the long axis 2.

2. Cells before division spherical, irregularly distributed within the gelatinous matrix or arranged more or less regularly in series of rows in three planes perpendicular to each other; cell division proceeding successively in three planes perpendicular to each other 2. ANACYSTIS
2. Cells before division discoid, distributed in a single linear series within the gelatinous matrix; division proceeding in a single plane through the diameter of the cell 3. JOHANNESBAPTISTIA
2. Cells before division spherical, ovoid, cylindrical, or pyriform, distributed through a flat or curved surface; cell division proceeding successively in two planes perpendicular to each other 3.
3. Plant a flat or curved plate; cells spherical, ovoid, or cylindrical, arranged regularly in series of rows perpendicular to each other. 4. AGMENELLUM
3. Plant a flat or curved plate; cells ovoid or cylindrical, irregularly arranged 5. MICROCROCIS
3. Plant spherical or ovoid; cells spherical to ovoid, cylindrical, or pyriform, regularly or irregularly arranged 6. GOMPHOSPHAERIA

GENUS 1. COCCOCHLORIS

Sprengel, Linn. Syst. Vegetabil., ed. 16, 4(1): 314. 1827. *Aphanosbece* Sectio *Coccochloris* Sprengel ex Kirchner in Engler & Prantl, Natürl. Pflanzenfam., ed. 1, 1(1a): 55. 1898. *Aphanosbece* Subgenus *Coccochloris* Kirchner ex Forti, Syll. Myxophyc., p. 76. 1907. *Microcystis* α *Macroscopicae* Elenkin, Not. Syst. Inst. Crypt. Horti Bot. Petropol. 2: 67. 1923. *Microcystis* α *Macroscopicae* Subgenus *Eucoccochloris* Elenkin, loc. cit. 1923. —Type species: *Coccochloris stagnina* Spreng.

Synschoecococcus Nägeli, Gart. Einzell. Alg., p. 56. 1849. *Cyrtosbece* Sectio *Synschoecococcus* Nägeli ex Hansgirg, Osmerr. Bot. Zeitschr. 34: 352. 1884. *Synschoecococcus* Subgenus *Eosynschoecococcus* Elenkin, Not. Syst. Inst. Crypt. Horti Bot. Petropol. 2: 65. 1923. —Type species: *Synschoecococcus elongatus* Näg. (= *Protococcus elongatus* Näg.).

Gloeosbece Nägeli, Gart. Einzell. Alg., p. 57. 1849. *Gloeosbece* Subgenus *Gloeosbece* Elenkin, Not. Syst. Inst. Crypt. Horti Bot. Petropol. 2: 69. 1923. —Type species: *Gloeosbece linearis* Näg.

Gloeoscapia Sectio *Rhodoscapia* Hansgirg, Prodr. Algenfl. Böhmen 2: 147. 1892. —Type species: *Gloeoscapia purpurata* Kütz.

Gloeoscapia Sectio *Xanthoscapia* Nägeli ex Kirchner in Engler & Prantl, Natürl. Pflanzenfam., ed. 1, 1(1a): 54. 1898. —Type species: *Gloeoscapia farcolata* Näg.

Original specimens of the type species of the following generic and subgeneric names have not been available to us for study:

Aphanosbece Nägeli, Gart. Einzell. Alg., p. 59. 1849. *Aphanosbece* Sectio *Aphanosbece* Nägeli ex Kirchner in Engler & Prantl, Natürl. Pflanzenfam., ed. 1, 1(1a): 55. 1898. *Aphanosbece* Subgenus *Aphanosbece* Kirchner ex Forti, Syll. Myxophyc., p. 79. 1907. —Type species: *Aphanosbece microscopica* Näg.

Rhabdoderma Schmidle & Lauterborn, Ber. Deutsch. Bot. Ges. 18: 148. 1900. *Gloeoscapia* Subgenus *Rhabdoderma* Elenkin, Not. Syst. Inst. Crypt. Hort. Bot. Petropol. 2: 69. 1923. —Type species: *Rhabdoderma lineare* Schmidle & Lauterborn.

Bocalaria Borzi, Nuova Notarizia 1905: 21. 1905. —Type species: *B. coarctescens* Borzi.

Rhabdoglossa Schröder, Ber. Deutsch. Bot. Ges. 35: 549. 1917. —Type species: *R. ellipsoidea* Schröder.

Spirillopsis Naumann, K. Sv. Vet.-Akad. Handl. 62(4): 18. 1921. —Type species: *S. irregularis* Naum.

Cyanoocloster Kufferath, Ann. Crypt. Exot. 2: 49. 1929. —Type species: *C. muscicola* Kuff.

Eucapsis Clemens & Shantz, *Minn. Bot. Seed.* 5: 134. 1909. *Ceroococcus* Subgenus *Eucapsis* Elenkin, *Not. Syst. Inst. Crypt. Horti Bot. Petropol.* 2: 68. 1923. —Type species: *Eucapsis alpina* Clem. & Shantz.

Endospora Gardner, *Mem. New York Bot. Gard.* 7: 27. 1927. —Type species: *E. rubra* Gardn. *Chroococcidiopsis* Geitler, *Arch. f. Hydrobiol., Suppl.* XII, 4: 625. 1933. —Type species: *C. thermalis* Geitl.

Radiocystis Skuja, *Symbolae Bot. Upsal.* 9(3): 43. 1948. —Type species: *R. geminata* Skuja.

Original specimens of the type species for the following generic and subgeneric names have not been available to us for study:

Aplococcus Rose, *Journ. de Bot.* 10: 321. 1896. —Type species: *A. natans* Rose.

Gloeoopsis Sectio *Cyanocapsa* Kirchner in Engler & Prand, *Naturl. Pflanzenfam.*, ed. 1, 1(14): 54. 1898. *Gloeoopsis* Subgenus *Cyanocapsa* Kirchner ex Foerl, *Syll. Myxophyc.*, p. 39. 1907. —Type species: *Protococcus violaceus* Corda.

Coslophariopsis Lemmenmann, *Abh. Nat. Ver. Bremen* 16: 353. 1899. —Type species: *C. halophila* Lemm.

Planosphaerula Borzi, *Nuova Notiziaria* 1905: 20. 1905. —Type species: *P. natans* Borzi.

Mycosarcina Printz, *K. Norske Vidensk. Selsk. Skr.* 1920(1): 35. 1920. —Type species: *M. consinna* Printz.

Sphaerodictyon Geitler, *Beih. z. Bot. Centralbl.*, II, 41: 231. 1925. —Type species: *Polycystis reticulata* Lemm.

Plantae microscopicae vel macroscopicae, cellulis in divisione binis plus minusve hemisphaericis, aetate protracta globosis, per gelatinum vaginale irregulariter vel in seriebus in tribus planis unoquodque ad alia perpendicularibus distributis; divisionibus cellularum seriatim in tribus planis unoquodque ad alia perpendicularibus procedentibus; gelatino vaginale hyalino vel deinde (in *A. montana*) rubrescentes vel coeruleascentes vel lutescentes.

In species of *Anacystis* the spherical cells divide successively in three planes perpendicular to each other. The cells thus formed become irregularly distributed through the gelatinous matrix or retain a regular cubical (eucapsoid) arrangement, distributed in series of rows in three planes perpendicular to each other. Bacteria, palmelloid Chlorophyceae and Rhodophyceae, and growth-forms of Nostocaceae and *Entophysalis* spp. are often mistaken as species of *Anacystis*.

Key to species of *Anacystis*:

1. Cells without pseudovacuoles, plants ^(not floating on water surface) not developing as water blooms 3
1. Cells containing pseudovacuoles, plants developing as water blooms 2
2. Cells (2.5—)3—7(—10) μ in diameter 1. *A. CYANEA*
2. Cells 0.5—2 μ in diameter 2. *A. INCERTA*
3. Cells 0.5—2 μ in diameter 3. *A. MARINA*
3. Cells larger 4
4. Cells up to 6 μ in diameter (larger where parasitized by fungi), the gelatinous matrix developing red, blue, or yellowish-brown pigments in aerial and subaerial habitats 4. *A. MONTANA*
4. Cells 6 μ in diameter or more, gelatinous matrix hyaline 5
5. Cells (8—)12—50 μ in diameter, usually remaining angular after division 5. *A. DIMIDIATA*
5. Cells chiefly 6—12 μ in diameter, soon becoming spherical after division.... 6
6. Plants marine, usually macroscopic 6. *A. AERUGINOSA*
6. Plants of fresh water, usually microscopic 7. *A. THERMALIS*