



PHYSIOLOGICAL NEWSLETTER



Message from the PSA President

The early August 2013 Orlando, Florida, meeting of the Physiological Society of America with the International Physiological Society exemplified the dynamic and exciting world of algal studies in today's changing world. In this issue of the PSA newsletter, you will read about some highlights of the conference, including attendance by INTEL science prize winner Sara Volz, and plans for next year's meeting in Portland, OR. It was a real pleasure for me to serve as PSA President during the conference and indeed this past year, primarily because I was able to work closely with so many dedicated and energetic PSA leaders, which include amazing committee chairs. It is clear to me that our society is in excellent hands, yet there is always a need for more engagement by the membership. So please, seriously consider answering calls to leadership service when they come; the PSA needs you!



PSA PRESIDENT
LINDA GRAHAM

Linda E. Graham

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IPC 10 / PSA HIGHLIGHTS

PSA-Supported Symposia at IPC10

During the 10 IPC in Orlando a Symposium entitled **Trends in Applied Phycology: Moving into the 21st Century** brought to a new audience the most recent trends in the burgeoning world algal cultivation, polysaccharides and other novel uses of algae, including their potential use for coastal bioremediation. The symposium, chaired by Drs. Alejandro Buschmann and Alan Critchley, featured a presentation by Dr. Jeff Hafting, a respected researcher working at Acadian Seaplants Limited, in eastern Canada on cultivation and uses of macroalgae, emphasizing how this industry is growing today. Erick Ask, a world-recognized professional, from FMC in the US, presented how they have promoted the development of seaweed cultivation in many different regions of the world, and clearly presented the relevance that this activity can have on socio economic development in coastal communities in different regions of the world. Then Dr. Maeve Edwards, a recognized specialist on kelp cultivation, provided her view on the cultivation of brown algae and uses in Europe. Finally, Dr. Charles Yarish a respected professor from the University of Connecticut, presented their latest results on the use of algal cultivation for bioremediation of urban coastal areas. He discussed the potential to reduce nutrient inputs of non-point sources that are not treated in waste-water treatment plants. The symposium drew around 100 participants. There was a wide range of questions from the audience, which allowed that the speakers to indicate and promote today's applied phycology offered many opportunities to young professionals, researchers and students.

– Alejandro Buschmann & Alan Critchley

The symposium entitled, **Into the Future: Going Where no Phycologist has Gone Before**, featured a spectacular set of lectures from the invited speakers. The session was co-hosted by Juliet Brodie (Natural History Museum, London) and Debashish Bhattacharya (Rutgers University, USA) and co-sponsored by the British Phycological Society and the PSA. The first speaker, J. Clark Lagarias from UC Davis, discussed the genetic structure of the light-sensing phytochrome proteins in algae providing a coherent scenario for their origin and putative functions. As he explained, the discovery that the cryptophyte *Guillardia theta* and the green algae *Micromonas* and *Nephroselmis* have orange/far-red photocycles and not the classic red/far-red provide evidence of adaptation to the marine environment. Next, Debashish Bhattacharya presented the results of long-term selection experiments with the model green alga *Chlamydomonas reinhardtii* that point to an efficient strategy for crop improvement. The genome-wide analysis done by his lab documents the remarkable metabolic flexibility of algae that allows them to adapt to stressful conditions. The third speaker, Eric Baptiste from the Université Pierre et Marie Curie in Paris, highlighted to a stunning degree how protein similarity network methods can be used to analyze and make sense of complex genome data from prokaryotes and eukaryotes. He presented novel analyses of algal genomes that obviate the role of endosymbiotic and horizontal gene transfer in giving rise to their varied gene inventories. The final speaker was Assaf Vardi from the Weizmann Institute of Science in Israel who captivated the audience with his analysis of redox signaling in diatoms. His pioneering work lays to rest the idea that phytoplankton are blithely floating in the ocean. Analysis of the redox state of proteins during environmental stress demonstrates that each cell compartment responds to stress (e.g., Reactive Oxygen Species, ROS) in a particular fashion and that this entire process has a specific program in diatoms, which may explain their ecological success in marine ecosystems. Together, these talks highlight future areas of growth in phycological research and underline the central role of endosymbiosis in shaping the complex history of algae and explaining their remarkable diversity and success on our planet.

– Debashish Bhattacharya and Juliet Brodie



Symposia, continued

The Orlando conference President's Symposium, **Algal Causes of and Cures for Coastal Deadzones**, featured a presentation by Karen Steidinger, a widely-known authority on harmful algae of the Gulf of Mexico and their role in fostering dead zones when excessive algal biomass is respired. Erica Young, a recognized expert on algal nutrients, described laboratory and applied studies indicating that macroalgae absorb and store large amounts of phosphorus and other nutrients that can be retrieved from harvested biomass, thereby helping to prevent eutrophication of natural waters and providing a source of nutrients for agriculture, because P, for example, is projected to become scarce in the future. Finally, Jun Yoshitani, a professional engineer having extensive experience in the wastewater treatment industry, discussed the potential for algae-based wastewater remediation to both reduce nutrient inputs to natural waters, thereby helping to reduce deadzones, and generate commercially useful materials, thereby subsidizing the remediation process. Mr. Yoshitani ended the symposium by strongly encouraging phycologists to connect with engineers and the private sector to create new technologies and companies that utilize the properties of algae to reduce pollution and create jobs that require algal expertise.

– Linda Graham

AWARDS at IPC 10

At the Closing Ceremonies of the International Phycological Congress Paul Gabrielson announced the winners of two annual student awards. The **Harold C. Bold Award**, which is given for “the outstanding graduate student paper(s) presented at the Annual Meeting”, went to **Sophie J. McCoy** of the University of Chicago (with co-authors R. T. Paine and C. A. Pfister) for their paper “Shifting strengths of species interactions in a guild of crustose coralline algae (Rhodophyta, Corallinales) respond to ocean acidification”.

Sophie McCoy



Ying Yang



Paul Gabrielson also announced the winner of the **Ralph Lewin Student Poster Award**, namely, **Ying Yang** of Worcester Polytechnic Institute for her poster (with Pamela Weathers) “Effects of light quality on *Ettlia oleoabundans*: role of red and far-red lights on growth and oil”.

Congratulations!

On behalf of the **Gerald W. Prescott Award** Committee, M. J. Wynne announced at the PSA business meeting that this year's Committee has selected "Diatoms of North America: the Freshwater Flora of Waterbodies on the Atlantic Coastal Plain" by **Peter A. Siver** (Connecticut College, New London) and **Paul B. Hamilton** (Canadian Museum of Nature, Ottawa). As communicated by C. Pfister (chair of committee): After deliberation and consideration of several nominated works, the Committee chose to recognize this volume due to its scholarship and utility to the phycological community. The text, bibliography, and micrographs were praised by the nominators and the committee. It received accolades, including that the volume is "charged with interesting and useful data, arranged in a very accessible way" as well as the recognition that we need more syntheses of morphological and ecological data for this important group and that this volume does this excellently.

In recognizing this volume, Wynne also thanked members of the Society for their nominations and participating in this vital process of rewarding the worthy efforts of those that produce volumes related to the understanding of algae.

See the Titles page of the newsletter for details on this award-winning book!



Prescott awardees Paul Hamilton (left) and Peter Siver (3rd from left) with Linda Graham (PSA President) and Mike Wynne (right, Prescott Committee Member) at the PSA Business Meeting in Orlando.

Also at the PSA business meeting, Arley Muth, representing the *Journal of Phycology*, announced this year's winners of the **Luigi Provasoli Award** for the "outstanding paper published in the *Journal of Phycology* during the previous fiscal year", namely, **Alena S. Gsell, Lisette N. de Senerpont Domis, Anna Przytulska-Bartosiewicz, Wolf M. Mooij, Ellen van Donk and Bas W. Ibelings** for their paper "Genotype-by-temperature interactions may help to maintain clonal diversity in *Asterionella formosa* (Bacillariophyceae)". *J Phycol.* 48: 1197–1208 (2012). As communicated by Arley on behalf of the Provasoli Award committee, this paper was selected because the "authors successfully address the influence temperature as a selective force to explain genotype-specific phytoplankton dynamics. The study merges genotypic characterization of different strains (AFLP) with growth experiments and ecological modeling. Eco-evolutionary dynamics present a hot topic in ecology, and it is only rarely (unfortunately) that one sees such studies in the *Journal of Phycology*."



Also at the Business Meeting, Juan Lopez-Bautista (at right) received a plaque from President Linda Graham (left) to commemorate his service as PSA President in 2012.



Outgoing Communications Chair Louise Lewis (at left) was thanked for her service by Linda Graham (right).

Highlights of the Education Workshop at IPC 10

An eager group of 20 psychologists from the US and as far away as Madagascar used their Wednesday "off" at the International Psychological Congress to attend a workshop, "Teaching for Understanding in Psychology: Designing learner-centered instruction." Taught by Diane Ebert-May, a professor of discipline-based biology education from Michigan State University, the full-day professional development workshop was a hands-on exploration of how to design learner centered activities. In fact, the workshop was conducted much the same way that Dr. Ebert-May teaches her 200+ students in Introductory Plant Science at MSU. Diane specializes in integrating life sciences and cognitive sciences to promote advancement of faculty and graduate student teaching techniques. In the workshop, we learned about redesigning coursework so instead of a teacher-centered, standard lecture approach with the teacher providing all or most of the information, the classroom is transformed into a student or learner-centered environment.



In learner-centered classes students actively discuss, design, draw models, and engage in peer-review of ideas. Work is done in small groups of 4-5, which sounded like a recipe for chaos in a huge classroom of desks riveted in place in a large lecture hall. But Diane showed films and explained how she pulls it off in a plant science class full of pre-med and pre-vet students. As an example, instead of presenting a 20-minute lecture on the carbon cycle, students break out into small groups and draw a carbon cycle, with annotated parts and processes, based on their reading. Groups discuss and every student draws the carbon cycle, and followed by a teacher-led discussion and critique of one or more groups' work.

Honestly, many of us were skeptical that one could use this approach in a psychology class or one with a huge amount of factual information, but many (most?) of us came away thinking that learner-centered activities just might work for our courses on algae and other subjects.

Diane also spoke about development of methods to engage students in higher-level cognitive thinking in the classroom and laboratory settings. During the workshop, we had an opportunity to practice many of the techniques Diane was speaking about and we had examples work with, in a way that was engaging us in the workshop. For example, in small groups, we had a chance to play with termites and develop hypotheses for the locomotion behaviors we were observing. Not psychological, but very engaging nonetheless! Overall, we learned many strategies to guide students to become active and self-motivated learners and at the same time boost classroom performance and long-term retention of information.

Simona Augyte and Rick McCourt

10th International Phycological Congress--Intel Inside

Colorado high school student Sara Volz, whose research on directed evolution in algae that could be used in biofuels, attended the IPC in Orlando this August as a guest of the PSA, where she presented a poster on her research and discussed her work with algal researchers from around the world. Ms. Volz won the 2013 Intel Science Talent Search, which drew more than 1,700 participants from across the U.S. Ms. Volz of Colorado Springs, who just turned 18 this summer and graduated from Cheyenne Mountain High School, won the \$100,000 first prize for her research project on algae.

Sara first got involved in science fairs in the 6th grade and got hooked. "And it was the next year in 7th grade that I learned about biofuels for the first time. I was really interested in doing something with alternative energy because it's really an omnipresent and really vital issue for us to solve an a modern world economy."

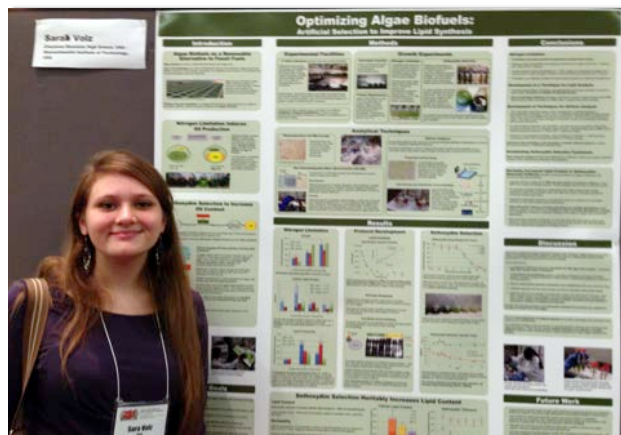
Her sophisticated experiments had humble beginnings. "We had this lazy Susan left over so I used that big wooden platform to set up all this PVC piping and fluorescent light covers," she said, "And I set up a bunch of algae tubes around a central light source. That was my system the first year and part of the second year. And then later I transitioned to flasks and this whole setup that I now have under my bed, because that's a lot easier to sample from and I can grow a lot more cultures." Sara noted, "They were on the same circadian rhythm I was, so it was easy to grow them that way. I picked a strain that I heard was one that wouldn't die too easily."

With few local algal mentors, Ms. Volz scoured the Internet for ideas to design her bioreactors, and she worked with faculty at Colorado State University and the Air Force Academy to adapt methods for measuring lipid content. After basic work on nitrogen limitation, which was a known factor in increasing lipid yield, Sara developed a novel idea on directed evolution.

"The thing that I did that got me this prize was I looked at a new technique to try and increase lipid production," she explained. "It was using artificial selection to develop populations of cells that had high oil content. I relied on the fact that there's an entire class of herbicides--the one I used is called sethoxodim--and its mode of action to kill weeds is to inhibit the enzyme acetyl-cocholate carboxylase, which catalyzes the rate-limiting step in lipid synthesis in algae. So I used that as a selecting agent to basically kill cells that didn't produce enough oil. Then I was able to over time develop these populations with unusually high lipid content."

Dr. Linda Graham, President of the PSA and Professor of Botany at the University of Wisconsin, extended the invitation to Ms. Volz to attend the Congress in Orlando. Sara and her mother, Pattye Volz, happily accepted and both of them went to many of the scientific sessions and the banquet. Sara and Pattye even attended the Business Meeting where Linda Graham introduced them. It has been a very busy summer for Sara ever since winning the Intel prize. She coached science fair participants and reviewed their projects in a summer program at the Massachusetts Institute of Technology, where Sara plans to study biochemistry starting this fall. Sara also presented her work at the White House and will do a TED talk this fall in California. Her prize and research were covered by the New York Times, the Huffington Post, and numerous television and radio networks. She also was interviewed for an article in the *Orlando Sentinel* that ran during the week of the Congress. She is preparing a manuscript on her research that she plans to eventually submit to the *Journal of Phycology*.

Sara's mother Pattye wrote, "The meeting really was a wonderful experience for Sara! We just can't thank [PSA] enough. Sara thoroughly enjoyed and appreciated learning about so much different algae work going on and meeting so many different scientists!" It's fair to say that this excitement was also felt by everyone at the Congress who met this exceptional young algal scientist.



Sara Volz, winner of the 2013 Intel Science Talent Search, stands next to her poster at the IPC. Her poster was titled, "Optimizing Algae Biofuels: Artificial Selection to Improve Lipid Synthesis."

-Rick McCourt

For more on Sara Volz and her interests in algae and biofuels, visit the [Algaezine](http://www.psaalgae.org/algaezine/algae.html) blog at <http://www.psaalgae.org/algaezine/algae.html>.

Mixer and Banquet



PHOTOS FROM BANQUET



PSA DEVELOPMENTS

LEWIN ENDOWMENT CHALLENGE DRIVE A SUCCESS!

Thanks to the generosity of those who donated, the partial proceeds from the auction and headquarters sales at this year's PSA/IPC meeting in Orlando, and a matching challenge grant, the Lewin Endowment Challenge drive has been met! The society's goal was to raise at least \$5,000 for the Lewin Endowment in order to raise the student poster award to a minimum of \$500 annually. Thanks to all who helped us reach this goal. And thanks to all future donors who will help keep this memorial endowment growing!

Paul W. Gabrielson

Russell L. Chapman

Richard McCourt, Chair, PSA Board of Trustees

PSA at 2013 AAAS Meeting in Boston

At the February 2013 American Association for the Advancement of Science meetings in Boston, volunteer members of Linda Graham's lab operated a PSA-sponsored activity booth at Family Days, a free annual AAAS science outreach event. Jennifer Knack, Izak Smith, Michael Piotrowski, and Chris Cardona-Correa worked for 6-hour stretches on each of the two event days. At our booth hundreds of children learned that seaweeds are the only source of alginate that is used in a wide variety of everyday products, including ice cream and toothpaste. With our help, the children used syringes to squirt colorful alginate solutions into a calcium chloride solution, which caused the alginate to solidify and make squiggly algae pets to take home. We handed out thousands of attractive and informative PSA bookmarks to kids and adults, including officials of the AAAS and NSF who visited our booth. We concluded that the AAAS Family Days event is a good way to promote our society, as well as the beauty and value of science.

Any PSA member interested in organizing or working at a similar booth at the February 2014 AAAS meetings in Chicago, please contact Linda Graham (lkgraham@wisc.edu), who has materials. Although other types of activities could be developed, the alginate activity—first developed by Susan Brawley and associates for the 2012 National Science and Engineering Fair held in Washington, DC—has now been tested twice and works quite well.



PSA member Izak Smith helps a youngster turn a colorful alginate solution into a squiggly worm shape.



Mike Piotrowski helps teammates prepare a transparent cylinder of calcium chloride, which will be used to colored gel alginate.

Upcoming Conferences

The **35th Annual Southeastern Phycological Colloquy** will be held at Dauphin Island Sea Lab during September 27-28, 2013 and it will be hosted by both The University of Alabama and The University of Alabama at Birmingham, by Juan Lopez-Bautista and Charles Amsler, respectively.

Deadline for registration and submission of presentations (oral and posters) is September 13, 2013.

More information can be found at <http://phycolab.ua.edu/sepc-2013/>



The 27th NORTHWEST ALGAL SYMPOSIUM

October 18-20, 2013
Casey Conference Center,
Whidbey Island
Coupeville, Washington

The 27th Northwest Algal Symposium (NWAS) will meet on the weekend of October 18-22, 2013 at Seattle Pacific University's Casey Conference Center on Whidbey Island in Coupeville, Washington. The symposium will include a range of oral and poster presentations pertaining to the many aspects of phycological research being conducted in the Pacific Northwest and elsewhere. The NWAS will provide the usual relaxed and informal environment for students and professionals alike to meet old colleagues, exchange ideas and make new contacts and friends. Awards will be presented for the best student poster and best oral presentation.

Housing for a limited number of participants and meals will be available at Camp Casey. The historic buildings at Camp Casey help maintain the unique

ambiance of Whidbey Island we've all come to appreciate over the years! Additional housing will be available by individual arrangement at a variety of hotels and campsites in the Coupeville area located about 10 minutes away from Camp Casey. The Saturday evening banquet, auction and distinguished lecture will be held at the Officer's Club at the Whidbey Island Naval Air Station located 15 minutes from Camp Casey. Dr. Fred Short will entertain and inform us as the invited speaker this year.

Further information, registration forms, instructions for accommodations & meals, directions and a call for abstracts. will be posted on the NWAS website (<http://www.nwasalgae.org/>). Registration & Abstract **deadlines will be September 27, 2013.**

For further information about the 27th NWAS, please contact Rob Fitch (rfitch@wvc.edu, (509) 682-6755) or Tim Nelson (tnelson@spu.edu, (206) 281-3640).

We look forward to an exciting, enjoyable and productive meeting for all participants!

Sincerely yours,
Tim Nelson & Rob Fitch



10th International Temperate Reef Symposium 12-17 January 2014

University of Western Australia

<http://10itrs.org/>

Dear friends and colleagues,

It is our pleasure to invite you to Western Australia for the 10th ITRS which will be held at UWA on the banks of the Swan River in Perth. Please see the conference web site for more information.

We hope to see you in 2014!



**Plenary Speaker is Paul Falkowski, Rutgers University.
Call for Abstracts now open!**

Abstract submissions for ISAP2014 are now open. Authors are able to submit their abstracts online via the ISAP2014 website. Submissions will close 31 January 2014 and delegates will receive a copy of all accepted abstracts onsite at the Congress.

For more information please visit the www.isap2014.com.



PSA meets at 1st Joint Aquatic Sciences Meeting (JASM) in 2014

The first ever Joint Aquatic Sciences Meeting (JASM) will be held in Portland, Oregon, on 18-23 May 2014. This meeting will bring together four societies: SFS (Society for Freshwater Science, formerly NABS), ASLO (Association for the Sciences of Limnology and Oceanography), SWS (Society of Wetland Scientists) and PSA (Phycological Society of America).

The theme for the meeting is **Bridging Genes to Ecosystems: Aquatic Science at a Time of Rapid Change**. An important aim of this meeting includes working toward an integrative understanding of aquatic systems and fostering collaboration and interaction across the participating societies. The meeting planning committee has developed five special sessions to accompany each of the five plenary talks.

Plenary speakers:

Ginger Armbrust - University of Washington
 Stuart Bunn - Australian Rivers Institute
 Laurel Larsen - UC Berkeley
 Julian Olden - University of Washington
 Patricia Soranno - Michigan State University

The five special sessions associated with the plenaries are:

- * Putting Microbial Genomes to Work in Ecosystem Science
- * Communicating the Value of Aquatic and Wetland Ecosystems to the Public and Policy Makers
- * Predicting Ecosystem Thresholds and Regime Shifts
- * Aquatic and Wetland Conservation in the Anthropocene? Principles and Practices for a Rapidly Changing World
- * Large-Scale Limnology - Integrating Terrestrial, Wetland, and Aquatic Interactions across Landscapes

Proposals for additional Special (integrative and for broad audiences) and Regular (discipline-specific) sessions are due **15 September 2013**. Details can be found at <http://aslo.org/meetings/portland2014/sessions/>

The Call for Abstracts will be issued in October 2013, and **abstract** submissions will be due online by **7 February 2014**. Please see <http://aslo.org/meetings/portland2014/sessions/> for more information.

As always, you may contact Dale Casamatta (dcasamat@unf.edu) for further information.

Funding Opportunities

PSA Student Grants and Fellowships:

Each year over \$25,000 is awarded to support student members in furthering their research (Grants-in-Aid of Research), education (Croasdale Fellowship), and travel to the annual PSA meeting (Hoshaw Travel Award). Competition for these awards is high, so the committee recommends that students have their advisors review their application before submission. Also, the committee would like to remind applicants that all incomplete (i.e. not addressing all of the required points of each award, missing letter(s) of recommendation) or late applications will not be reviewed. The deadline and requirements for each award application is listed on the PSA website: <http://www.psaalgae.org/website/opportunities/grants.html>. The committee looks forward to reviewing more great applications this year!

Upcoming deadline for the Grants-in-Aid of Research: Nov. 1, 2013

Please see the PSA website for information and the reporting requirements of successful applicants: http://www.psaalgae.org/website/opportunities/grants/grants_in_aid.html

Hoshaw Travel Award: This award helps students with travel expenses to the annual PSA meeting. Due to an early meeting (end of May 2014), and therefore an early registration deadline, the next Hoshaw deadline will be on **Jan. 7**. Please see the PSA website for details.

Upcoming Courses



Student admires macroalgal diversity on San Juan Island.

MARINE ALGAE

Friday Harbor Laboratories, University of Washington

Dates: 16 June - 18 July 2014

Instructors:

Dr. Wilson Freshwater (freshwaterw@uncw.edu) and Dr. Paul Gabrielson (drseaweed@hotmail.com)

Application deadline: **1 February 2014**

The theme of the course is principles, methods, and applications of marine macroalgal biodiversity studies. This is a hands-on field and laboratory intensive course. Students will learn classical and contemporary methods to characterize, identify and classify marine algae; the theories underlying the methods; application of biodiversity information in research (e.g. benthic ecology, cellular evolution), regulatory (e.g. invasive species) and industrial (e.g. biofuels) settings. Students will gain practical experience in tools that are applicable worldwide, such as: specimen collection, preservation, and databasing; light microscopy; DNA isolation and sequencing; computational approaches to phylogeny reconstruction. Field work will be extensive, as the diverse and species-rich aquatic habitats around San Juan Island are ideal for the examination of macroalgal diversity.

For more information about the course, visit: <http://depts.washington.edu/fhl/studentSummer2014.html>

For information on the Friday Harbor Labs, including how to apply, housing, and financial aid packages, visit: <http://depts.washington.edu/fhl/>

For requirements and how to apply for a Croasdale Fellowship that helps defray costs to attend a phycology course at a biological field station, visit:

<http://www.psaalgae.org/website/opportunities/grants/croasdale.html>

Freshwater Algae Course, Kindrogan Field Centre, Scotland, 20-27 June 2014

Your Tutors: Dr Eileen J Cox and Prof Elliot Shubert;

Guest Lecturer Prof Geoff Codd and Guest Tutor: Dr Laurence Carvalho

Course outline: The area around Kindrogan provides a diversity of habitats for freshwater and sub-aerial algae, offering many opportunities to learn about this fascinating and ecologically important group of plants.

We shall take full advantage of this excellent range of local aquatic and terrestrial habitats in this beautiful area of Highland Perthshire to provide a sound introduction to the recognition, identification and ecology of freshwater algae. Emphasis will be placed on the use of the microscope and taxonomic keys for the identification of algae to generic and species level, but also broader aspects of algal morphology, structure, reproduction, and classification (morphological and molecular) will be covered. We normally see live examples of all major algal groups, including freshwater reds and browns. For those with some prior experience of the algae, we hope that the opportunity to study samples from a range of habitats will broaden your knowledge and/or allow you to focus on particular groups.

Field trips, on foot or by road, will be varied, but not strenuous and will be complemented by laboratory work, illustrated talks and class discussion.

Course Fees & What is Included:

- Resident approximately £500 Sole Occupancy or approximately £450 Shared Accommodation.
- Non Resident £350 (everything **except** bed and breakfast)
- Full professional tuition, full board accommodation including cooked breakfast, packed lunch, Tea/Coffee, homemade cakes and an evening meal.
- *Vegetarian and other dietary options are catered for.*
- Transport to all field sites, where required, from supper on 20th until after breakfast on the 27th June.



Fall 2013 ATP³ Workshop

Arizona State University's Center for Algae Technology and Innovation (AzCATI) and the Culture Collection of Algae at the University of Texas (UTEX) together offer a comprehensive workshop program through the D.O.E.-sponsored Algae Testbed Public-Private-Partnership (ATP³) on the cultivation of microalgae, strain selection, pilot-scale cultivation, harvesting and processing, and analysis of valuable oils and co-products.

The Fall 2013 ATP³ workshop will cover practical applications of growing and managing microalgal cultures at production scale, including methods for handling cultures, screening strains for desirable characteristics, identifying and mitigating contaminants, scaling up cultures for outdoor growth, harvesting and processing technologies, as well as the analysis of lipids, proteins and carbohydrates. Related laboratory and field training will include numerous hands-on opportunities for participants to collect and perform routine sample measurements, monitor cultures for contaminants, and evaluate the chemical composition of algal biomass.

This workshop is ideal for those interested in obtaining a broad overview of the management of microalgal cultures at scale, and for advanced students and trainees interested in the practical applications of microalgae. Participants are encouraged to ask questions, share information and network. Printed and electronic materials will be included, and a certificate of completion will be provided at the conclusion of the workshop. Workshop enrollment is limited to 15 participants and will be filled on a first-come basis.

ATP³ workshops offer a diverse range of topics pertaining to the management and processing of microalgal cultures, and uses of their products. Laboratory and field training are led by highly-trained scientists and engineers. For more information about this and future workshops please visit www.atp3.org/education.

Phycological Trailblazer No. 39: L. Kolderup Rosenvinge

[Janus] Lauritz [Andreas] Kolderup Rosenvinge (1858-1939) was a Danish botanist and phycologist (Fig. 1), his major work being his investigations of marine macro-algae of Danish waters, including Greenland. While a student (Fig. 2), he was drawn to both vascular plants and the algae. Some of his earliest papers were on freshwater algae (Rosenvinge, 1879a, b). After he earned a Masters degree, he left Denmark, first going to Stockholm, where he worked in the lab of V. B. Wittrock (Hansen, 1985). He then moved on to the lab of Eduard Strasburger in Bonn, Germany. Next he moved on to the lab of plant physiologist Wilhelm Pfeffer in Tübingen. It was in the Pfeffer lab in 1884, where he carried out experiments to observe the effects of various environmental factors on morphogenesis. He was able to spend time studying on the Atlantic coast of France (Cherbourg) as well as on the Mediterranean coast. He also worked on the Norwegian coast. Some of the experiments were to study the earliest stages of germination and the establishment of polarity in *Fucus* zygotes. These studies were incorporated into his thesis research. He demonstrated that the first plane of division was oriented perpendicular to the direction of incident light, the lower daughter cell producing the rhizoid and the upper cell developing into the erect thallus (Hansen, 1985). The broader scope of his thesis research was understanding the influence of external factors on polarity and organ formation in plants. So he looked at not only fucoids (*Fucus* and *Ascophyllum*) and some red algae (*Scinaia furcellata* and *Schizymenia dubyi*) but also genera of flowering plants: *Begonia*, *Pisum*, *Vicia*, *Fagus*, *Scutellaria* and others. His thesis publication appeared in 1888.

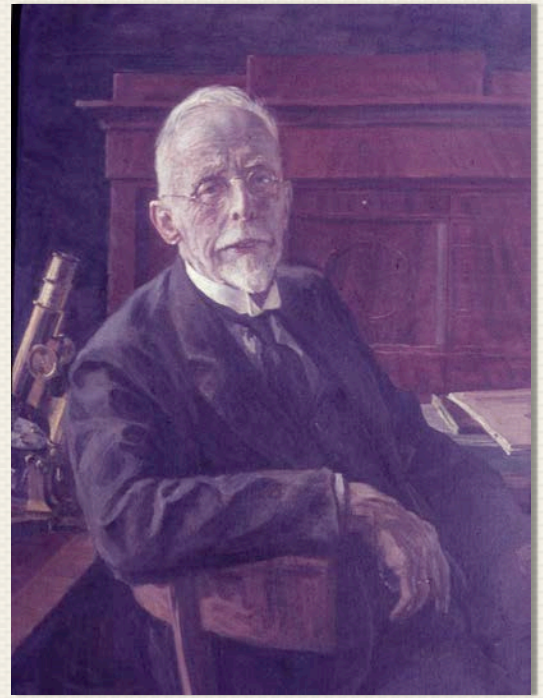


Fig. 1. L. Kolderup Rosenvinge. Photograph (made by Robert T. Wilce) of an oil painting in the Botanical Laboratory, University of Copenhagen.



Fig. 2. L. Kolderup Rosenvinge at age 22. [Acta Horti Bergiani 3(2), pl. 19 (1903)].

Around this same time he received funding to carry out a study of both marine and terrestrial vegetation of western Greenland. This project was arduous and demanding under harsh circumstances. He was able to take advantage of transport on a boat from the Danish navy. He also carried out this study using an “umiaq”, which is a primitive rowing boat used by the locals (Hansen, 1985). He published on the algae of Greenland in 1893 and described new species: *Laminaria groenlandica* [= *Saccharina groenlandica*], *Myriocladia callitricha* [now *Papenfussiella callitricha*], *Ralfsia ovata*, *Ectocarpus pycnocarpus* [now treated as conspecific with *E. fasciculatus*], *Ulvella confluens* [= *Pseudopringsheimia confluens*], *Ulvella fucicola* [= *Pseudendoclonium fucicola*], and *Urospora hartzii*, and new genera: *Coelocladia* (*C. arctica*), *Omphalophyllum* (*O. ulvaceum*) (Fig. 3), and *Symphyocarpus* (*S. strangulans*). Additional papers appeared on his work done on the marine algal flora of Greenland (Rosenvinge, 1894) and on eastern Greenland (1898a, b, c), based on the collections made by N. Hartz.

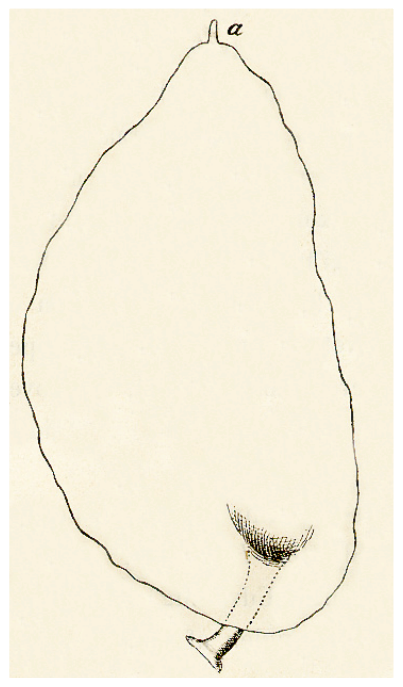


Fig. 3. *Omphalophyllum ulvaceum* Rosenv. Habit. (Fig. 19A in Rosenvinge, 1893).

Over the years Rosenvinge received algal collections made on Danish or Norwegian expeditions, and he published on his results. He had a good eye for novelties. From the “Danmark-Expedition” to northeastern Greenland (north of 76° N latitude), with collections made by the botanist A. Lundager, he described the new species *Cruoriopsis hyperborea* [now = *Rhodophysemopsis hyperborea*] and *Punctaria glacialis* (Rosenvinge, 1910). The lack of the usual hairs present in the alleged *Punctaria* was a clue to its unusual taxonomic status. Recent molecular phylogenetic studies on this and related taxa by Kawai et al. (2013) revealed that three genera, including this *P. glacialis*, may deserve recognition as a new family and order of brown algae.

Rosenvinge (1924) worked up the algal collections made by Johannes Gandrup on an expedition to Jan-Mayen Island in the Arctic Ocean as well as those made by H. G. Simmons on the 2nd Norwegian Arctic Expedition in the “Fram” (Rosenvinge, 1926). He also received collections of algae brought back from “King Christian IX’s Land” (East Greenland) and described the new brown algal genus and species *Acrocytis groenlandicus* (Rosenvinge, 1933). But because the material was not reproductive, this taxon remains of uncertain status. In collaboration with zoologist Th. Mortensen, Rosenvinge described some interesting algae that were thought to be parasitic on their marine hosts, namely, various starfish taxa (Mortensen & Rosenvinge, 1910, 1933, 1934).

The major accomplishment in Rosenvinge’s professional career was the marine algal flora of Denmark. Part I of the red algae (Rosenvinge, 1909) included his precise account of the hundreds of sampling stations, which were usually dredging sites, including data on the nature of the bottom and the water temperature and salinity. Danish waters included the North Sea, the Skagerak, the Limfjord, the Kattegat (divided into several parts), the Samsø area, the Little Belt, South Fyen waters, Great Belt, Smaaland Sea, the Sound, and the Baltic Sea. Although he had started making collections of Danish algae toward the end of the 1870s, it was not until 1890 that he began energetically to carry out extensive collections, which continued over the years 1891-1895. He made use of a triangular dredge with sharp steel teeth, the so-called Reinke’s model.

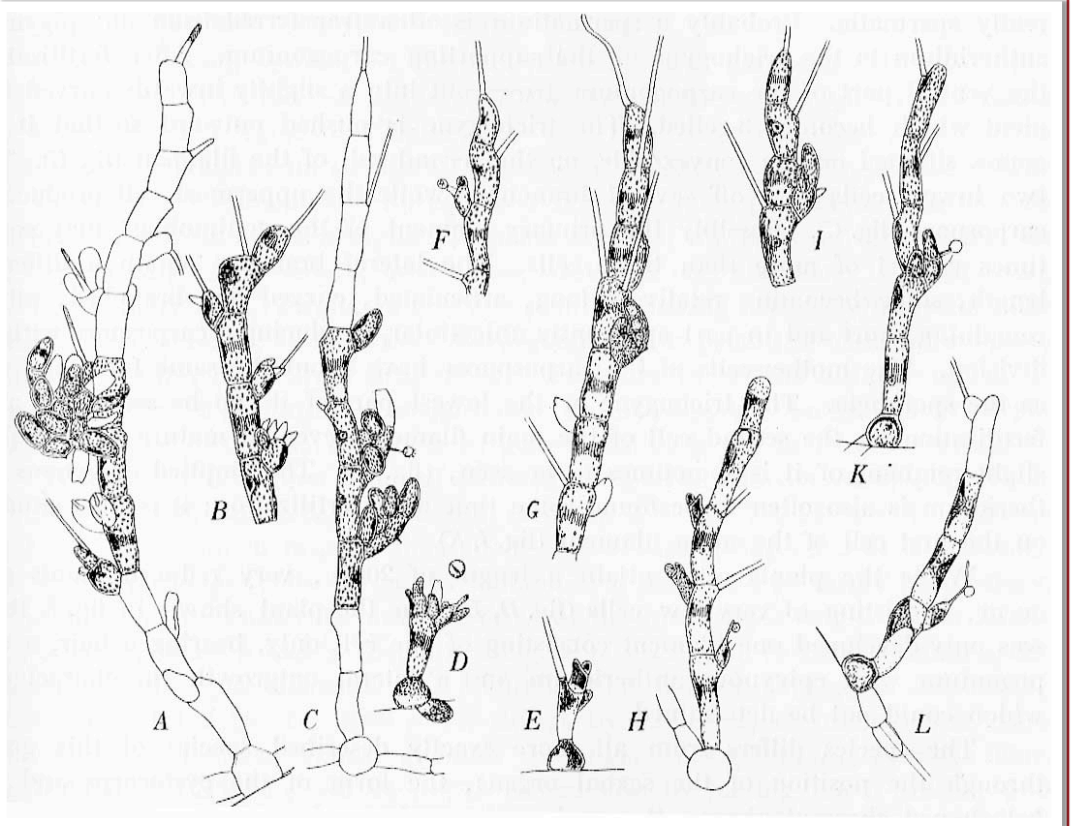


Fig. 4. *Chantransia gynandra* Rosenv. [now *Acrochaetium gynandrum* (Rosenv.) Hamel] (Fig. 18 in Rosenvinge, 1909.)

Most of his collections were preserved as herbarium specimens, which reached about 8,000 in all. He also put hundreds of his specimens into alcohol and formalin and kept a large number of stones with encrusting algae. He did his own artwork, and his illustrations were done with great care and accuracy. In the genus *Chantransia*, Rosenvinge recognized a total of 24 species, of which 15 were newly described (Fig. 4). He also established the new genus *Kylinia*, named for Harald Kylin and based on the new species *K. rosulata*. Although close to the genus *Chantransia*, *Kylinia* was regarded by Rosenvinge as distinctive because of the androphore cells and the production of the carpogonia on the very small plants. Current taxonomic schemes treat his marine species of *Chantransia* as well as his *Kylinia* as within *Acrochaetium*.

Rosenvinge (1927) made observations on the “sliding” movements of monospores, tetraspores, carpospores, and even spermatia in a number of red algae, including both Bangiophyceae and Florideophyceae. The highest velocity was observed in *Erythrotrichia reflexa*, where the monospores moved about 140 μm in one minute. In a demonstration of his powers of observation, Rosenvinge (1928) was able to show that in *Phyllophora brodiaei* [now *Coccotylus truncatus*] the monoecious plants have the auxiliary cells forming a number of protuberances that give rise to filaments that produce wart-like nemathecium with radiating filaments of seriate tetrasporangia. Cystocarps are never produced. Rosenvinge (1932) was not persuaded by Hamel’s (1931) merger of *Monostroma obscurum* into *M. fuscum* and presented his justification for maintaining them as separate species. These species are now known as *Ulvaria obscurum* and *U. splendens*, respectively.

In regard to Rosenvinge’s academic career, he earned the Ph.D. degree in 1888 from the University of Copenhagen. His early employment (1886 through 1900) was as a librarian and assistant at the botanical garden in Copenhagen. Starting in 1895, he was a lecturer at the University of Copenhagen, and from 1900 he also lectured at the Polytechnic (Stafleu & Cowan, 1983). He became Professor of Botany in 1910 and continued until his retirement in 1928. Another accomplishment was his long tenure as editor of *Botanisk Tidsskrift*, serving from 1894 through 1931 (vols. 19-41).

In 1928 a “Festschrift” was published by Dansk Botanisk Arkiv on the occasion of Rosenvinge’s 70th birthday, with numerous articles on algae and fungi, including papers by H. Kylin, F. Børgesen, C. H. Ostenfeld, Henning E. Petersen, and J. Boye Petersen. Earlier, Børgesen (1914) named the brown algal genus *Rosenvingea* (Fig. 5) in his honor, while Silva’s (1957) *Rosenvingiella* was a replacement name for Rosenvinge’s (1893) *Gayella*, which was a later homonym. Søren Lund undertook his dissertation research under the supervision of Rosenvinge. Lund (1959) recognized his mentor with the generic name *Kolderupia* in the brown algae, including in it the two species, *K. maritima* (Kjellman) S. Lund [which was later designated the generitype by Wilce (1966)] and *K. lucifuga* (Kuckuck) S. Lund. Wilce (1966), however, presented evidence to treat *K. maritima* as conspecific with *Pleurocladia lacustris* A. Braun, and *K. lucifuga* was also transferred to *Pleurocladia*, thus merging *Kolderupia* within *Pleurocladia*.



Fig. 5. *Rosenvingea sanctae-crucis* Børgesen. Caracas, Venezuela, coll. Gisela Falcon no. 63, 1957. (In MICH).

- Børgesen, F. 1914. The marine algae of the Danish West Indies. Dansk Bot. Ark. 2(2): 1-66.
- Festschrift to L. K. Rosenvinge. 1928. Dansk Botanisk Arkiv 5(5), with portrait.
- Hamel, G. 1931. Chlorophycées des côtes françaises. Revue Algologique 6: 9-73.
- Hansen, J. B. 1985. An outline of phycology in Denmark. Second International Phycological Congress, Copenhagen, 4-10 August 1985. 24 pp.
- Kawai, H., T. Hanyuda, A. Kai, T. Yamagishi, G. W. Saunders, C. Lane D. McDevit & F. C. Küpper. 2013. Life history, molecular phylogeny and taxonomic revision of *Platysiphon verticillatus* (Phaeophyceae). 52nd Northeast Algal Symposium, General Program, Mystic, CT, pp. 31-32. [Abstract.]
- Lund, S. 1959. The marine algae of East Greenland. I. Taxonomical part. Meddelelser om Grønland 156 (1). 247 pp.
- Mortensen, T. & L. Kolderup Rosenvinge. 1910. Sur quelques plantes parasites dans des échinoderms. Bull. Acad. R. Sci. & Lett. Danemark, 1910(4): 339-354, 1 pl.
- _____. & _____. 1933. Sur une nouvelle algue, *Coccomyxa astericola*, parasite dans une astérie. K. Danske Videnskab. Selskab. Biologiske Meddelelser 10(9): 1-8.
- _____. & _____. 1934. Sur une algue Cyanophycée, *Dactylococcopsis echini* n. sp., parasite dans un oursin. Kgl. Danske Videnskab. Selskab., Biologiske Meddelelser 11(7): 1-10.
- Petersen, H. E. 1940. L. Kolderup Rosenvinge. 7 November 1858—18. Juni 1939. Botanisk Tidsskrift 45: 131-137, portrait. [In Danish.]
- Rosenvinge, L. K. 1879a. *Vaucheria sphaerospora* v. *dioica* n. var. Botaniska Notiser 1879: 190.
- _____. 1879b. Bidrag til kundskaben om slaegterne *Ulothrix* og *Conferva*, saerligt med hensyn til vaeggens bygning. [Etudes sur les genres de l'*Ulothrix* et de la *Conferva*, specialment par rapport à la structure.] Botanisk Tidsskrift 11: 114-134, 1 pl.
- _____. 1884. Bidrag til Polysiphonia's Morfologi. Botanisk Tidsskrift 14: 11-53, 2 pls. [+ 1-10 pp., French résumé.]
- _____. 1888. Undersøgelser over ydre faktorerers indflydelse paa organdannelsen hos planterne. Forsvares Tirsdagen den 2. April 1888 Kl. 12 I Universitetsauditorlet. No. 3. 117 pp., 3 pls.
- _____. 1892. Om nogle Vaextforhold hos Slaegterne *Cladophora* og *Chaetomorpha*. Botanisk Tidsskrift 18: 29-64.
- _____. 1893. Grønlands Havalger. Meddelelser om Grønland 3: 765-981, 2 pls.
- _____. 1894. Les algues marines du Groenland. Annales des Sciences Naturelles, Botanique [Paris], sér. 7, 19: 53-164.
- _____. 1897. Algues marine. In: C. Ostenfeld-Hansen, Contributions à la flora de l'île Jan-Mayen. Botanisk Tidsskrift 21: 26-28.
- _____. 1898a. Deuxième mémoire sur les algues marines du Groenland. Meddelelser om Grønland 20: 1-125, 1 pl.
- _____. 1898b. Om Algevegetationen ved Grønlands kyster. Meddelelser om Grønland 20: 127-242 + [1].
- _____. 1898c. Sur la végétation d'algues marines sur les côtes du Grønland. Meddelelser om Grønland 20: 339-346.
- _____. 1900. Note sur une Floridée aérienne (*Rhodochorton islandicum* nov. sp.). Botanisk Tidsskrift 23: 61-81.
- _____. 1903. Sur les organes piliformes des Rhodomelacées. Kgl. Danske Vidensk. Selsk. Forhandl. 1903(4): 439-472.
- _____. 1905a. Om fremmede alger ilandrevne paa Jyllands vestkyst. Botanisk Tidsskrift 27: 83-103.
- _____. 1905b. Sur les algues étrangérées rejetées sur la côte occidentale du Jutland. Botanisk Tidsskrift 27: 104-106.
- _____. 1906. Note sur *Monostroma obscurum* (Kütz.) Ag. Revue Algologique 6: 297-300.
- _____. 1909. The marine algae of Denmark. Contributions to their natural history. Part I. Introduction. Rhodophyceae I. (Bangiales and Nemalionales). Kgl. Danske Videnskabernes Selskabs Skrifter, 7. Raekke Naturvidensk. Math. Afd. 7(1): 1-151, 2 pls., 2 folded charts.
- _____. 1910. On the marine algae from north-east Greenland (N. of 76° N. Lat.) collected by the "Danmark-expedition". Meddelelser om Grønland 43(4): 93-133.
- _____. 1911. Remarks on the hyaline unicellular hairs of the Florideae. Biologiske Arbejder Tilegnede Eug. Warming. pp. 203-215.
- _____. 1917. The marine algae of Denmark. Contributions to their natural history. Part II Rhodophyceae II (Cryptonemiales). Kgl. Danske Videnskabernes Selsk. Skr. 7: 153-284, 2 pls.
- _____. 1923-1924. The marine algae of Denmark. Contributions to their natural history. Part III. Rhodophyceae III. (Ceramicales). Kgl. Danske Videnskabernes Selsk. Skr. 7: 285-487, 3 pls, 2 maps.
- _____. 1924. Marine algae. In: A botanical trip to Jan Mayen, by J. Gandrup. Dansk Botanisk Arkiv 4(5): 21-23.
- _____. 1926. Marine algae collected by Dr. H. G. Summers during the 2nd Norwegian Arctic Expedition in 1898-1902. Report of the Second Norwegian Arctic Expedition in the "Fram" 1898-1902. No. 37: 1-40.
- _____. 1927. On mobility in the reproductive cells of the Rhodophyceae. Botanisk Tidsskrift 40: 72-80.
- _____. 1929. *Phyllophora brodiaei* and *Actinococcus subcutaneus*. Kgl. Danske Videnskab. Selskab. 8(4). 40 pp., 1 pl.
- _____. 1931a. The marine algae of Denmark. Contributions to their natural history. Part. IV. Rhodophyceae IV. (Gigartinales, Rhodymeniales, Nemastomatales). Kgl. Danske Videnskabernes Selsk. Skr. 7: 491-630, 1pl.
- _____. 1931b. The reproduction of *Ahnfeltia plicata*. Kgl. Dansk Videnskabernes Selskab., Biologiske Meddelelser 10(2): 1-29.
- _____. 1933. Marine algae from Kangerdlugssuak. Meddelelser om Grønland 104(8): 1-14.
- _____. 1935a. Distribution of the Rhodophyceae in the Danish waters. D. Kongelige Danske Videnskabernes Selskabs Skrifter. Naturv. og Math. Afd., 9. Raekke 6(2): 1-44. (Mémoires de l'Académie Royale des Sciences et des Lettres de Danemark, Copenhagen, Section des Sciences, 9me série 6(2).

- _____. 1935b. On some Danish Phaeophyceae. With contributions by Søren Lund. Kgl. Danske Vidensk. Skrifter, Naturv. og Mathem. Afd. 9. Raekke 6(3): 1-40. (Mémoires de l'Académie Royale des Sciences et des Lettres de Danemark, Copenhagen, Section des Sciences, 9me série 6(3).
- _____. † & S. Lund. 1941. The marine algae of Denmark. Contributions to their natural history. Vol. II. Phaeophyceae. I. Ectocarpaceae and Acinetosporaceae. Kgl. Danske Vidensk. Selskab, Biologiske Skrifter 1(4): 1-79.
- _____. † & _____. 1943. The marine algae of Denmark. Contributions to their natural history. Vol. II. Phaeophyceae. II. Corynophlaeaceae, Chordariaceae, Acrothricaceae, Spermatochnaceae, Sporochneaceae, Desmarestiaceae, Arthrocladiaceae with supplementary comments on Elachistaceae. Kgl. Dansk Vidensk. Selskab, Biologiske Skrifter 2(6): 1-59.
- _____. † & _____. 1947. The marine algae of Denmark. Contributions to their natural history. Vol. II. Phaeophyceae. III. Encoeliaceae, Myriotrichiaceae Giraudiaceae Striariaceae, Dictyosiphonaceae, Chordaceae, and Laminariaceae. Kgl. Dansk Vidensk. Selskab, Biologiske Skrifter 4(5): 1-99.
- _____. † & _____. 1950. The marine algae of Denmark. Contributions to their natural history. Vol. II. Phaeophyceae. IV. Sphacelariaceae, Cutleriaceae, and Dictyotaceae. Kgl. Danske Videnskabernes Selskab, Biologiske Skrifter 6(2): 1-80.
- _____. & E. Warming (eds.). 1912. *The botany of Iceland*. J. Frimodt, Copenhagen.
- Silva, P. C. 1957. Notes on Pacific marine algae. *Madroño* 14: 41-51.
- Stafleu, F. A. & R. S. Cowan. 1983. Taxonomic literature II. Vol. IV: P-Sak. Second edition. Bohn, Scheltema & Holkema, Utrecht/Antwerp. *Regnum Veget.* Vol. 110.
- Wilce, R. T. 1966. *Pleurocladia lacustris* in Arctic America. *J. Phycol.* 2: 57-66.
- Wille, N. & L. K. Rosenvinge. 1885. Alger fra Novaia-Zemlia og Kara-Havet, samlade paa Dijmphna-Expeditionen 1882-1883 af Th. Holm. pp. 81-96, 2 tables.

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- No. 39: L. Kolderup Rosenvinge. *Phycological Newsletter* 49(2): 15-19. (2013) [on-line only.]

Obituaries

A tribute to Frank Trainor (11 February 1929—12 February 2013)



Frank Trainor, holding his sumac goose carving, Avery Point, Connecticut, 2004 (photo credit, Glen Thursby)

This past winter, a day after his 84th birthday, Francis Rice (Frank) Trainor passed away in Storrs, down the road from the University of Connecticut where he had spent his professional life. Frank received his graduate degrees under the mentorship of Harold Bold. He accepted a position in Storrs in 1957, immediately after received his doctorate, and remained there for 40 years. With great persistence and his gentle unhurried demeanor, Frank discovered unheard of phenotypic plasticity in isolated cultures of *Desmodesmus* (then, spiny species of *Scenedesmus*) (Trainor 1998). With his many students and colleagues, and spanning six decades, Frank published over 100 scientific papers and two books (Trainor 1978, 1998). Frank was beloved by his students who found his kindness and generosity extraordinary, but also his willingness to accept scientific failure as well as success, never once dissuading them from difficult, or near impossible projects. His optimism for his own and his students' research was well-received and usually well-founded. Although an extremely humble man, any tribute to Frank must mention some of the

honors bestowed on him: President of the PSA (1968-1969), President of the Northeast Algal Society (NEAS, 1987-1988), the Darbaker Award from the Botanical Society of America (1965), the PSA Award of Excellence (2002), and NEAS's Frank S. Collins Award. In 2010 NEAS inaugurated the Frank Trainor Poster Award, for best student poster at the annual meeting.

I got to know Frank by the proximity of our institutions and by his devotion to NEAS, which he was instrumental in nurturing in the 1960s. Frank became a beloved figure to the entire northeastern community of phycologists. He served NEAS in nearly all capacities where he often displayed his wonderfully dry sense of humor. In his lecture as the symposium's Honorary Chair in 1992, he showed a slide of 4 staggered mouse pelts with tails intact, as a model for *Scenedesmus*, or as he said, "skinny dead mice." From 1998 through 2012 Frank donated his exquisite, stylized bird carvings for the NEAS auction, which raised US\$8295 for the Society's student travel fund. Innumerable students in the Northeast have reaped the benefits of Frank's labors, and he will be sorely missed by this community. A longer memoriam is presented by Shubert *et al.* (2013). Contributions in Frank's name can be made to a fund for graduate student research by contacting The UConn Foundation Inc., Francis Rice Trainor Endowment Fund #30244, 2390 Alumni Drive, Unit 3206, Storrs, CT 06269 USA.

Trainor F.R. 1978. *Introductory phycology*. John Wiley & Sons, Inc., 525 pp.

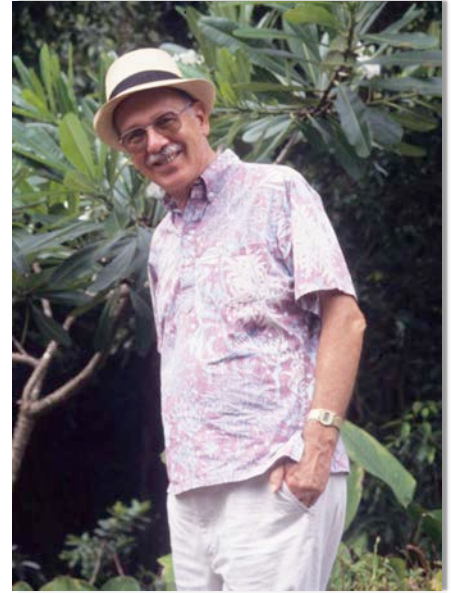
Trainor F.R. 1998. *Biological aspects of Scenedesmus: phenotypic plasticity*. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, Germany, 367 pp.

Shubert E., Lewis L.A. & Siver P. 2013. In memoriam. Francis R. Trainor (11 February 1929—12 February 2013). *Phycologia* 52: 457-459.

Craig W. Schneider, Trinity College, Hartford, Connecticut

Richard E. Norris (13 April 1926 – 17 July 2013)

With sadness, we note the passing of Professor Richard E. Norris at the age of 87 in his home in Friday Harbor, San Juan Island, Washington. A lengthy account of his life and his many achievements and contributions to research on the algae was provided earlier (Wynne, 2012). Perhaps the most significant feature of his life-long dedication to studying the algae was its tremendous breadth in that his many publications covered truly all taxonomic groups, microscopic to macroscopic forms, marine and freshwater, diatoms and coccolithophorids to red and brown seaweeds. He employed tools from electron-microscopy (TEM and SEM) to life-history studies, along with traditional systematic and morphological investigations. One of his hallmark papers (Hibberd & Norris, 1984) was the recognition of the new phylum Chlorarachniophyta. He served as President of both the Phycological Society of America (1971) and the International Phycological Society (1976-1979). He mentored numerous PhD students, especially when he returned to his undergraduate alma mater, the University of Washington, Seattle. He and his wife Fiona Getliffe-Norris, after living initially on San Juan Island, where Rich was a resident faculty member at Friday Harbor Laboratories, later lived and worked in scattered locations: Johannesburg, Pietermaritzburg, and Cape Town in South Africa; Honolulu, Hawaii; and Fort Worth, Texas, before retiring to San Juan Island. In his retirement years he became a certified Master Gardener and was active in community out-reach efforts, such as giving lectures and serving as a judge in the “Flower Hall” at the San Juan County Fair.



Richard E. Norris, August, 1992, on north shore of Oahu, Hawaii.

Richard Norris is survived by his wife Fiona, his son Richard Jr., his daughter Laura and grandchildren Claire, Graham, and Michael. Contributions in his name can be made to the Marine Science Fund or the E. S. Morse Institute, both at Friday Harbor Laboratories, University of Washington, Friday Harbor, WA 98250. The latter supports collaborative research between Friday Harbor Labs and marine labs in Japan.

Hibberd, D. J. & R. E. Norris. 1984. Cytology and ultrastructure of *Chlorarachnion reptans*

(Chlorarachniophyta divisio nova, Chlorarachniophyceae classis nova). *J. Phycol.* 20: 310-330.

Wynne, M. J. 2012. Phycological Trailblazer No. 36: Richard E Norris. *Phycological Newsletter* 48(1): 14-20. On-line.

Michael J. Wynne, University of Michigan, Ann Arbor

News

C C M E E

(CULTURE COLLECTION OF MICRORGANISMS FROM EXTREME ENVIRONMENTS) University Of Oregon

During August-October, 2013 this culture collection is being moved to EMSL (Environmental Molecular Science Laboratory) of the Pacific Northwest National Laboratory) in Richland, Washington for permanent maintenance and curation. Sometime after the move is made, cultures will again be available to scientists. The EMSL will determine the rules, prices, etc. for sending cultures.

Richard W. Castenholz, Professor Emeritus, Institute of Ecology and Evolution, University of Oregon.

News

Partner with the Algae Biomass Organization



Commercial applications of algae are expanding rapidly thanks in large part to the partnerships that have formed among the research community, entrepreneurs, investors and government agencies working to advance new technologies into the marketplace.

Much of the cooperation among a group with such diverse backgrounds is facilitated by the [Algae Biomass Organization](#) (ABO), the trade organization for the algae industry. ABO's chartered mission is to promote the development of viable commercial markets for renewable and sustainable products derived from algae. These algae-derived products include fuels, feed, food, chemicals, plastics and even services such as wastewater treatment and carbon emission abatement.

ABO was founded in 2008 by a small group of scientists and entrepreneurs that hoped to bring together the expertise of a few companies with those conducting the latest research. It is now an organization of more than 250 individuals, companies, and organizations from every corner of the industry. Member companies include Sapphire Energy, Algenol, Boeing, Duke Energy and Aurora Algae. National laboratory partners include Los Alamos National Laboratory, the National Renewable Energy Laboratory and the Pacific Northwest National Laboratory. Research partners include the San Diego Center for Algae Biotechnology at UC San Diego and the Arizona Center for Algae Technology and Innovation at Arizona State University.

Each year ABO brings the industry's leaders together at world's largest algae conference, the Algae Biomass Summit, this year being held in Orlando, Florida September 30th – October 3rd. The Summit is the premier conference to share research findings, learn best practices and determine the financing and investment trends that are driving this rapidly expanding industry. Hundreds of people make valuable connections and initiate new partnerships at the Algae Biomass Summit.

ABO also works to educate the public as well as more technical audiences about the potential of the commercial algae industry. In 2012 ABO launched [allaboutalgae.com](#), an educational website for those just beginning to hear about the promise of algae. For technical audiences ABO will soon be publishing its *Industrial Algae Measurements Version 6.0*, a document of measurement methodologies for use across the industry. ABO members also are given special opportunities to participate in shaping future legislation that may affect the algae industry in everything from research funding to agricultural tax law that will influence where and how algae crops are grown.

For those looking to participate in the partnerships that are making possible a new generation of renewable, sustainable products derived from algae, the Algae Biomass Organization is the place to make connections, share best practices and prepare for the next big thing.

More information about the ABO as well as how to become a member can be found at www.algaebiomass.org.

PSA Annual Business Meeting Minutes

August 6, 2013

Renaissance Orlando at Seaworld Hotel, Orlando, USA

The meeting was called to order by PSA President Linda Graham at 6:02pm, with 46 members in attendance.

Linda introduced Intel Science Winner, Sara Volz, and her mother, Pattye. Sara and Pattye were invited to the meeting by the Phycological Society of America, and Sara presented a poster on her award-winning research on culturing candidate algal strains for biofuels.

Mike Wynne, representing the Prescott Award committee, awarded the 2013 Prescott Award to Peter Siver and Paul Hamilton for their book, *Diatoms of North America: The Freshwater Flora of Waterbodies on the Atlantic Coastal Plain*.

Arly Muth, Assistant Editor for the *Journal of Phycology*, presented the Provasoli Award for the best paper in the *Journal* in 2012 "Genotype-by-temperature interactions may help to maintain clonal diversity in *Asterionella formosa* (Bacillariophyceae)", by Alena Gsell, Lisette de Senerpont Domis, Anna Przytulska-Bartosiewicz, Wolf Mooij, Ellen van Donk and Bas Ibelings.

Linda Graham recognized Juan Lopez-Bautista for his service on the Executive Committee of the PSA for the past three years in his role as Vice-President/President-Elect, President and Past-President, and also recognized Louise Lewis as outgoing Communications Director.

President's Report (Linda Graham): Linda reported on the AAAS Family Days event in February 2013, and described the alginate activity that was organized to engage several thousand school-age children. Linda described her plans to participate in the 2014 AAAS Family Days at the annual AAAS meeting in Chicago. Linda then described the *AlgaeZine* outreach publication that she developed over the past year, which is available electronically, and said she would welcome article contributions for subsequent issues.

Program Director's Report (Dale Casamatta): Dale reported that the 2013 meeting is proceeding well, and he thanked the local organizers and IPC organizers. The 2015 meeting will be held in Philadelphia, PA, at Drexel University, with Rick McCourt and Naomi Phillips as local organizers. In 2016 the PSA will meet at John Carroll University in Cleveland, OH, and Jeff Johansen will be the local organizer. The 2017 meeting is planned for Monterey, CA, with Mike Graham as the local organizer. Next year (2014) we will be meeting in Portland, OR, as one of the societies in the Joint Aquatic Sciences Meeting (which includes the Society for Freshwater Science (formerly NABS), the Association for the Sciences of Limnology and Oceanography, the Phycological Society of America and the Society of Wetland Scientists). The theme of the meeting is "Bridging Genes to Ecosystems: Aquatic Science at a time of Rapid Change". Dale presented a list of the keynote speakers who have been confirmed for the meeting, which includes Ginger Armbrust (University of Washington), Stuart Bunn (Australian Rivers Institute), Laurel Larsen (UC Berkeley), Julian Olden (University of Washington), and Patricia Soranno (Michigan State University). Dale also called for session and workshop proposals, and let the membership know about a website link for people to submit their ideas (<http://aslo.org/meetings/portland2014/sessions/index.php>). The deadline for proposals is August 31, 2013.

Student Representative's Report (Matt Bennett): Matt reported that the student social at the current meeting was very successful (about 60 people attended). We have at least 240 student members in PSA at the present time, and this number has grown substantially over the last several years. Approximately 133 students attended the 2013 meeting. Matt expressed his appreciation for the fund drive to increase the Lewin Award endowment line to equal the monetary value and prestige of the Bold Award.

Business Meeting Minutes, continued

Education Committee's Report (Jessie Muhlin): The Education Committee hosted an active learning workshop at the 2013 meeting with Diane Ebert-May, and also developed a poster on the use of psychological materials for display in botanical gardens, zoos and aquaria. Jessie indicated that the Education Committee would be happy to help develop workshop ideas put forward by society members for future meetings.

Membership Director's Report (Deb Robertson): As of August 1, 2013, the PSA had 849 paid members, and more than 200 non-renewed members (of which some are student members who need to be properly accounted for through Wiley's system). She encouraged all non-renewed full members to renew as soon as possible. It was also pointed out that members can sponsor memberships, which can be arranged through customer service at Wiley. She also encouraged members to let her know if they are attending other meetings that may have potential new members present since she has some advertising materials that can be used. Deb related that the Executive Committee (EC) is not recommending a change in dues for 2015, but may need to re-visit the dues structure for 2016 given our income model and the recent reduction in income from the Journal. The postdoctoral category has grown, and she welcomes ideas on how the PSA can support its postdoctoral members.

Treasurer's Report (Eric Linton): Eric reported that the PSA finances are in good condition, and he thanked Chuck Delwiche for all of his help during the transition period. The Society currently holds approximately \$1.9 million in total assets. Over the last two years we have had more than \$100,000 in net income. He noted that the main source of the Society's income is the profit share from the Journal, which has decreased over the past few years by about \$13K. Some questions were asked about the trend in institutional memberships, and Eric replied that they have decreased. It was also pointed out that PSA needs to obtain more current information on institutional memberships from Wiley, and Wiley was unable to send a representative to the meeting this year. It was requested that PSA develop a mechanism to look at the relative change in subscriptions due to bundling. John Stiller (Vice-President/President-Elect) related the changes that are coming with regulated Open Access, and that he will be examining this issue in detail during his year of PSA presidency (2014); he intends to have an in-depth report on this issue for the membership next year.

Journal of Phycology Report (Arly Muth for Mike Graham): The current editorial office has been in place for 1.5 years. They have been streamlining the review process, with the submittal to acceptance time down to below 100 days. The submittal to online time is now approximately 200 days, and submittal to print time about 300 days (down from 500). The time to rejection has also decreased to 30 days, and the "reject without review" category has been important for achieving this efficiency. The Journal will be publishing its first "Letter" in the October issue, which is intended to be a forum for high impact, broad interest papers. Finally, Arly reported that there was a slight increase in impact factor for the Journal this year.

Chair of the Board of Trustees's Report (Rick McCourt): Rick described the role of the Board of Trustees (BoT): to advise the EC, invest and increase the endowment, and provide programmatic advice. Rick introduced the BoT members, and noted that several positions will be turning over soon. Paul Zimba will be completing his term at the end of the calendar year and Michelle Wood will be joining the BoT at that time. Rick thanked Paul for all of his service over the last number of years. Steve Murray will also be rotating on to the BoT after Tim Nelson completes his term as Fund Manager at the end of next year. Rick described the Lewin Award campaign, and noted that the proceeds from this year's auction and headquarters room will go towards increasing this fund. Paul Gabrielson, Russ Chapman and Rick McCourt have volunteered to match these proceeds. The BoT is exploring the idea of corporate sponsorship. Rick also described an idea that the BoT will be putting into action over the coming year - the development of a Legacy Society within PSA for those Society members who intend to recognize PSA in their wills.

Business Meeting Minutes, continued

Fund Manager's Report (Tim Nelson): The PSA investments are managed by US Trust, in three separate accounts (the Treasury Reserve, Life Members Fund and Endowment), with a total value of \$1,741,352. This year 13 Hoshaw Awards, seven Grants-In-Aid, five Croasdale Awards, one Provasoli Award, one Prescott Award, the Bold and Lewin Awards, and conference symposia were all supported by endowment interest. The Endowment recently grew due to two large transfers from the Treasury over the past year. Tim reported that the interest rate decline is still hurting the Endowment, but rates will probably increase over the coming year, which may mean that principal values will decrease. The Life Members Fund and the Treasury both fared well in 2012. Tim outlined anticipated funding for 2014, which is at the same level as this year (and will not need to be supplemented from the Treasury). He called for book proposals that could be supported by the publications line.

Grants & Fellowships Committee Report (John Stiller for Amy Carlile): A total of 15 reviewers volunteered to review the 74 applications for the three awards handled by the committee (Grants-In-Aid of Research, Croasdale Award and Hoshaw Awards). More than \$26K was awarded this year to 25 students. Forty-five applications were submitted for the Grants-In-Aid and seven awards were made, totaling >\$10K, five Croasdale Awards were made with 10 applicants, and 13 Hoshaw Awards with 19 applicants.

Elections Committee Report (Wayne Litaker): This year 167 members participated in the PSA elections. The positions will be filled as follows: Vice-President/President-Elect – Rick Zechman; International Vice-President – Juliet Brodie; Communications Director – Kirsten Müller; Membership Director – Deb Robertson; Student Representative – Kathryn Shoenrock; Editorial Board Members – Bill Henley, Susan Carty, Hae Jin Jeong and Matt Parrow. This year the Elections Committee asked members to submit a fair amount of information to complete the nomination process, and it was noted that this resulted in a decrease in the number of nominations, so they will be returning to a more basic nomination procedure next year. Linda Graham reported that the EC will be recommending a change in the bylaws with respect to the nominations process, which will appear on the next PSA ballot.

Past-President's Report (Juan Lopez-Bautista): Juan reported that we will be voting on two bylaw changes on next ballot: formalizing the process for removal of officers, and clarifying the terms of student member.

Vice-President/President-Elect (John Stiller): John reminded the membership that we will be meeting early next year (in May), and encouraged any PSA members to contact him with any PSA matters of concern.

The minutes from the 2012 PSA Annual Business Meeting were distributed, and approved by the membership.

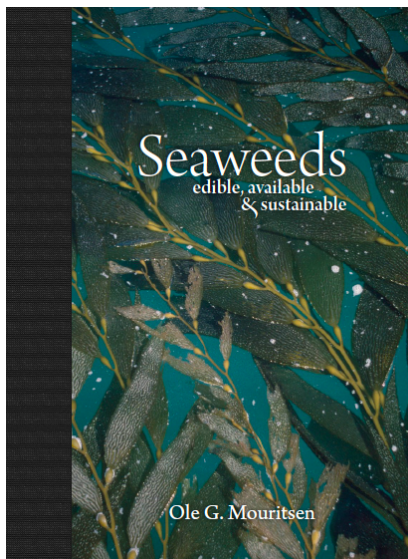
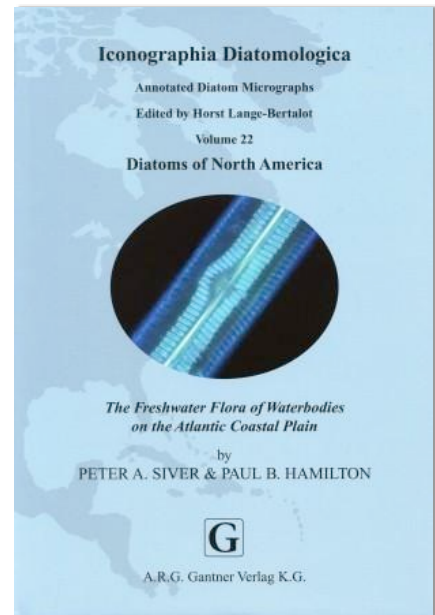
The meeting was adjourned shortly after 7:00pm.

Minutes respectfully submitted by PS Secretary Alison Sherwood

TITLES OF INTEREST

At right, front over of the book winning the Prescott Prescott Award for 2013:

P.A. Siver and P.B. Hamilton (2011) *Diatoms of North America. The Freshwater Flora of Waterbodies on the Atlantic Coastal Plain. Annotated Diatom Micrographs, Vol. 22* edited by H. Lange-Bertalot. 273 pls. 7 Tables, 4 Appendices. 916 pp. Hardcover. A.R.G. Gantner Verlag K.G. ISBN 978-3-906166-95-7, distributed by Koeltz. Euros 186 (\$260.40).



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