

# The PHYCOLOGIST

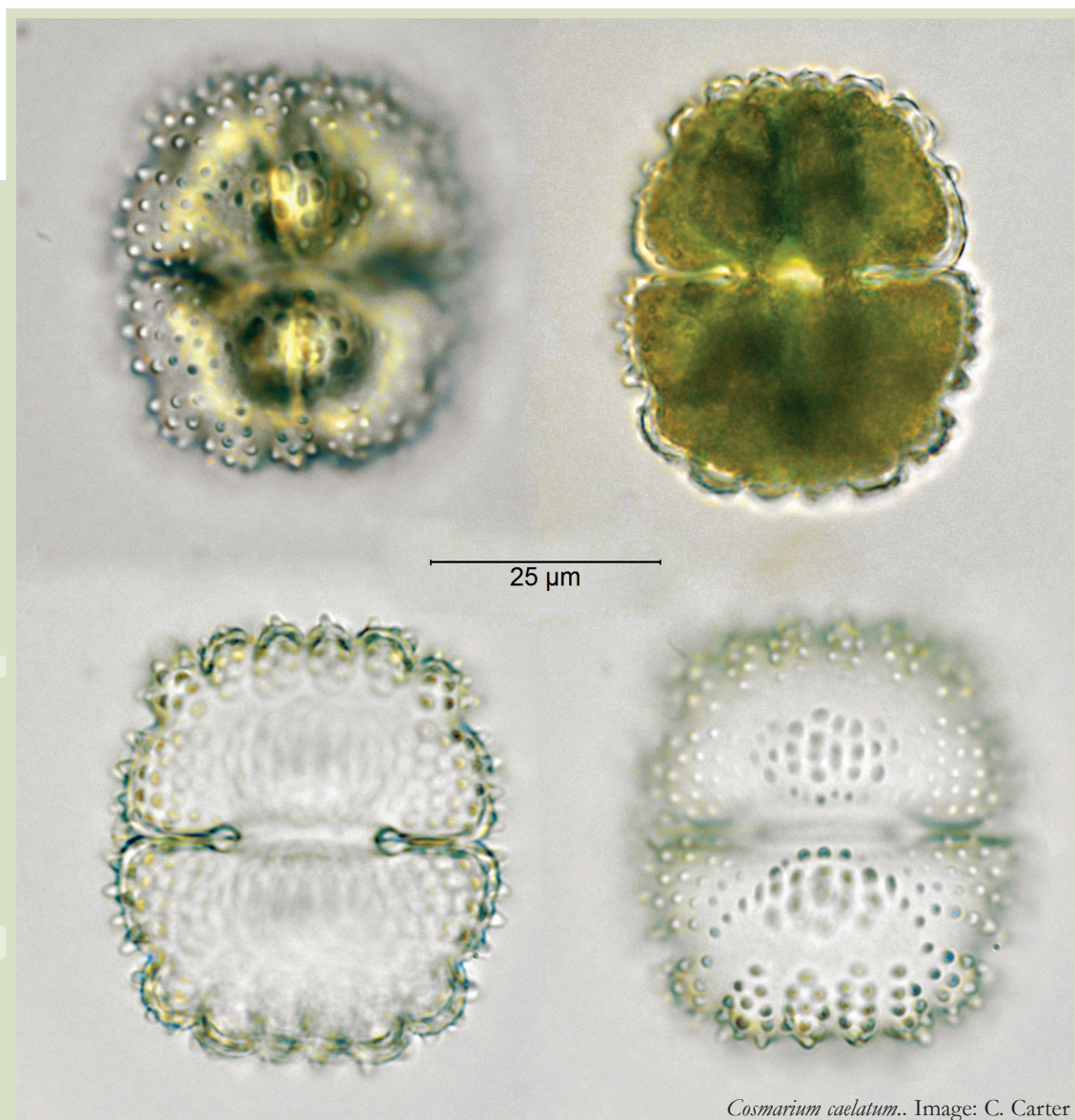


The Newsletter of the British Phycological Society

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Autumn 2009



*Cosmarium caelatum*.. Image: C. Carter

**2008 Kathleen Drew-Baker Award and New Investigator Award  
Student bursary award reports  
Announcements**

# 2009 British Psychological Society

## Council Officers (January to January)

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### *President Elect*

Professor Paul Hayes (2009-2010)

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### *Membership Secretary*<sup>3</sup>

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### *Editor of The Psychologist*<sup>4</sup>

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Dr Rupert Perkins (2008-2011)

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Dr Martha Clokie (2007-2010)

Dr Martyn Kelly (2008-2011)

Dr James Metcalfe (2009-2012)

Dr Thomas Proeschold (2007-2010)

Dr Agnes Mortensen<sup>6</sup> (Student Rep. 2009-2011)

Dr Marian Yallop (2009-2012)

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# Editorial

Without further ado, here is the autumn edition packed to the brim with excellent contributions from our members, including student membership proposals and a new online facility for the *EJP* from our Membership Secretary, student bursary award reports, the first circular for the 58<sup>th</sup> Winter meeting of the BPS to be held in Oban, Scotland, and many more.

In spring 2008, the BPS announced new awards for the 'best' paper published in the *European Journal of Phycology* (the Kathleen Drew-Baker Award) and for the 'best' paper published by a 'new' investigator (the New Investigator Award); in this edition we detail the 2008 winners. Details for the 2009 Hilda Canter-Lund photography award are also featured.

To end on there is a 'Diatom Noir'...interested....now read on!

Do keep sending in your contributions. Write to us with your phycological views, news, work events, or any matter you wish to share with readers of *The Phycologist*. YOUR input is required; all relevant material will be considered (job adverts, science reports, book reviews, news items of topical interest, meeting announcements, research news, and suggestions for future articles are always welcome). Without YOU the newsletter would not exist.

As a reminder, previous issues of *The Phycologist* can be downloaded at <http://www.brphycsoc.org/phycologist.lasso>

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Jan Krokowski

Editor of *The Phycologist*

# Student Membership

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At the recent Summer Council Meeting, the student membership of the Society was reviewed and discussed. Currently our student membership remains healthy with 46 paid up members for 2009, of which 15 receive the journal. So far in 2009 we have received 44 new membership applications across all categories, with 25 of these being from student members. Current subscription fees for student members are very competitive at £5.00 for annual membership without the journal and £30.00 for annual membership with the journal. Students are entitled to the reduced membership fee for a maximum of four years. Student members benefit enormously from the Society through support networks and financial assistance to attend training courses, conferences and our own Winter Meeting.

To meet the increasing number of requests for financial assistance and to allow us to continue to generously support our student members, Council are proposing a number of changes to the student membership as outlined below.

- **Proposal 1**

Increasing the student membership subscription fee for annual membership without the journal to £10.00 (an increase in £5.00 per year).

- **Proposal 2**

Offering student members the opportunity to apply for multiple year membership rather than annual membership. We are proposing a new membership category of a set number of years for a fixed fee linked to the average length of PhD studentship funding.

In addition to the proposed £10.00 subscription fee for one year membership without the journal, students will have the option to apply for three years membership without the journal for a total fee £20.00.

These changes will be formally proposed at the next Annual General Meeting to be held during the Annual Winter Meeting in Oban in January 2010. If the proposals are ratified they will take effect from 2011, with the appropriate changes being made on all membership application and renewal documents in time for January 2011.

If you have any comments relating to these proposals please contact me before 11<sup>th</sup> December 2009, to allow me to include them in my report for the AGM in January 2010.

## New online facility for the *European Journal of Phycology*

As our continued partnership with Taylor and Francis as publishers of the *European Journal of Phycology* goes from strength to strength with the improved 2008 Impact Factor of 1.826 and the new Five-Year Impact Factor of 2.193, Taylor and Francis are offering a new online service via their informaworld platform.

### *iFirst*

*iFirst* is an early online publication system, which makes new articles available in the shortest possible time. Articles are available via *iFirst* until they are assigned an issue, so could be available online months before they would have been previously. Once the article has been assigned an issue and is published online it is removed from the *iFirst* list and is then available under the issue's table of contents. *iFirst* reduces the amount of time

between article submission and publication, which in turn extends the Impact Factor 'window' and increases citations as articles are available for longer.

*iFirst* is available to all BPS members who subscribe to the *EJP*. Every year informaworld will issue a voucher allowing current *EJP* subscribers to access the informaworld platform. The first time you access the platform you will need to create an informaworld account via the link on the voucher. This will give you online access to the *EJP* and *iFirst* for all four issues of that volume. The voucher will need to be renewed annually, though you will keep the same informaworld account once this has been set up. Vouchers will be distributed via e-mail by informaworld at the start of each year, so it will be even more beneficial for you to renew your membership early in the year and ensure your



contact details are up-to-date!

Further information about *iFirst* is available at <http://www.informaworld.com/smpp/ifirst~db=all>

### Table of contents

informaworld also provide a table of contents alert service for the *EJP*. This is available to any member interested in finding out what is in each issue of the journal, though only those members subscribing to the *EJP* will be able to access full articles and download them as PDFs. Those members not subscribing to the journal will be able to access abstracts and author details. In order to receive e-mail alerts outlining the contents of the latest edition, members must register with

informaworld and create an informaworld account (for full details and to create an account go to <http://www.tandf.co.uk/journals/titles/09670262.asp> and click on Table of Contents Alerting). Members can then choose which journals they wish to receive e-mail alerts from.

All members can also view tables of contents for each issue of the *EJP* online at :

<http://www.informaworld.com/smpp/title~content=713725516~db=all>

It is hoped that both of these services will be taken advantage of by BPS members and we welcome any feedback you have of using these services. Please do not hesitate to get in touch with me.

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## Hilda Canter-Lund photography award 2009

This award was established by the British Phycological Society in recognition of Hilda Canter-Lund, whose stunning photographs will be known to many members. Her photomicrographs of freshwater algae combined high technical and aesthetic qualities whilst still capturing the quintessence of the organisms she was studying.

The BPS Council offers an annual award (currently £150) for a photograph on a phycological theme that best combines these informative, technical and aesthetic qualities. It can be of a micro- or macroalga, marine or freshwater, taken by any photographic medium. The competition is open to all (not just BPS members) with a closing date of 31 November each year. Shortlisted photographs will be placed on the BPS website and the winner will be announced at the Annual Winter Meeting.

### Rules:

1. The competition is organised by the British Phycological Society ([www.brphycsoc.org](http://www.brphycsoc.org))
2. You do not need to be a member of the British Phycological Society to enter the competition.
3. The photographer and copyright owner must be identified at the time of submission (the photographer will be assumed to own the copyright unless we are told otherwise).
4. Only one entry is allowed per person.
5. Entries must not have been previously published.
6. There are no restrictions on approach or style? anything from a landscape photograph to an electron micrograph is permitted, so long as the phycological theme is obvious.
7. Entries should be sent to: **MGKelly@bowburnconsultancy.co.uk** by 31 November 2009. The filename of the entry should be the name of the photographer (e.g. Joe\_Bloggs.jpg). No additional information should be submitted (see rule 11 below).
8. Each file submitted for judging must be a JPEG with a maximum size of 1Mb and images that exceed this will not be considered. However, the original image, which will be requested for shortlisted entries, must be capable of being viewed and printed at 20 x 30 cm without loss of image quality. Preferably this will be a TIFF image (uncompressed or with less compression e.g. by LZW) with pixel dimensions of c. 2400 x 3600 (because this allows images of 20 x 30 cm to be printed satisfactorily).
9. Photographs must have been taken in the last five years.
10. Basic image enhancement is permitted (i.e. cropping, adjustment of contrast, colour balance etc) but composite images are not acceptable. If there is any doubt, the judges may ask to see the raw image from which the final image was derived.
11. Five images will be selected from those submitted by the judging panel to form a shortlist, which will be displayed on the BPS website by 15 December 2009. The photographers of these images will be contacted before this date and asked to provide a legend, giving additional details about their image.

## Introductory Course on Freshwater Algal Identification (Durham)



Algal Training Course - Durham July 09

**Haywood Dail Laughinghouse IV**  
**Marine-Estuarine-Environmental Sciences**  
**Graduate Program**  
**College of Chemical and Life Sciences**  
**University of Maryland, USA**

During the summer of this year, I was fortunate to receive financial support from the British Phycological Society, permitting me to travel from the Washington, DC area to Durham, UK for algal courses organized by Prof. Brian Whitton and Prof. David John. I decided to take both the Introductory and Advanced courses since I was travelling from abroad, but I am writing about the introductory course for which I received the support, making the journey possible.

I arrived a day before the course began, at the Newcastle International Airport, and was greeted by Prof. Whitton with a sign saying Algal Training. After some confusion of me trying to get into the wrong/right side of the car, we started our journey to Durham, where we already began conversations on cyanobacterial taxonomy seeing that my schooling was different to Prof. Whitton's views. Here I received interesting pre-course information on the ecology of algae, specifically cyanobacteria and diatoms, with their relation to nutrient uptake, especially relating to phosphorus.

After a quick tour of Durham, pointing out the places to see, Prof. Whitton checked me into the college and was off to get ready for the beginning of the course the next day. The other participants arrived the following day, most from various parts of the UK (Environment Agency, consultancies, or universities), but there were two others that flew in from overseas (Thailand and New Zealand) also staying for both courses. Some participants had more algal experience than others, or more experience in a particular group.

Prof. Whitton's lectures, while commenting roughly on the taxonomy and identification of cyanobacteria, always tended to have a more ecological tendency, demonstrating how you

could use the alga as an indicator organism, and in which conditions the alga is usually found. He also pinpointed certain features on the cyanobacteria that appear in nutrient limited or enriched conditions, which were most interesting. After a few days of lecture, you knew that when he began to speak, he would go on for a while, because there is so much experience and information, that in the few days of lecture/lab he was not able to teach us all.

Prof. John lectured on the taxonomy of the other algal groups (minus cyanobacteria and diatoms). Time also seemed short for teaching all these groups, but we were able to see most in lecture and in the lab. His love for the green algae and desmids were readily seen as he spoke of these groups. He told of the best places to collect the different groups in bodies of water, and demonstrated diagnostic characteristics to separate the groups according to their features.

We had one day of diatom lecture and lab with Dr. Martyn Kelly, who showed us how to practically use and understand his manual during the lecture, and afterwards had a few hours to try it on our own under his supervision.

Dr. Gordon Beakes taught a lecture on interesting microscopic techniques, with some fantastic photos he has taken with some of his microscopes, and Dr. Alan Donaldson explained the LUCID CD software for algal identification and some practical applications to remember certain cyanobacterial names.

During the lab sessions, Prof. John, Prof. Whitton, and Dr. Donaldson, were always willing to help and would explain all and any of our questions to the best of their knowledge. Also, after using our brains all day long, we would get thirsty by nightfall, so our algal discussions would take us to a short walk down the river to the pub.

The course was wonderful and I would suggest it for people that have experience and that don't have experience with algae. I would like to thank the fellow participants for the new friendships, to the organisers for their time and commitment with the course...it is truly fantastic, and to the BPS for the support.



# 1st Marine Phytoplankton Taxonomy Workshop (Plymouth, UK, July 2009)

**Amandine Caruana**  
**PhD on DMS and DMSP**  
**production by**  
**dinoflagellates,**  
**University of East**  
**Anglia, Norwich, UK**

I have been working for several years with phytoplankton cultures and I have experimented with different groups of algae such as cyanobacteria, chlorophyceae, dinophyceae, including some freshwater and marine species. I have acquired a broad knowledge in phytoplankton physiology and ecology but how can I pretend to be an expert in phytoplankton without being able to identify any species? I am particularly investigating dinoflagellate species during my PhD since I have highlighted a huge variability between dinoflagellate species in dimethylsulphoniopropionate (DMSP) production, the precursor of the cooling-climate gas dimethylsulphide (DMS). I know many dinoflagellates by their name but I did not know how to recognise their "faces". I really wished to learn more about phytoplankton identification before finishing my PhD.

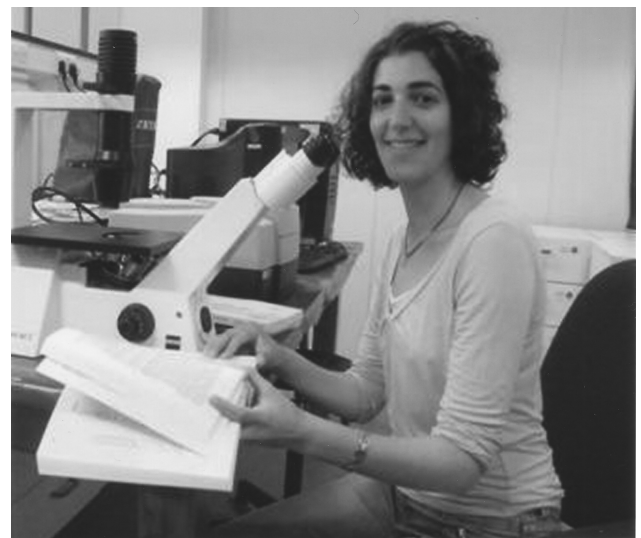
I was really lucky that I was selected to attend this new workshop. This was organised last July 2009 by SAHFOS and MBA at Plymouth. Excellent tuitions were delivered by international experts: Diana Sarno on the identification of diatoms, Carmelo Tomas on dinoflagellate identification, harmful algal blooms and techniques of isolation and counting, Alison Taylor on coccolithophores, Linda Medlin on the molecular techniques, Barry Leadbeater on flagellates, and also with the interventions of Gerald Boalch and John Day. Lectures were alternated with practicals to illustrate the course with microscopic observations. The SAHFOS and MBA supplied microscopes, culture samples from the Plymouth Culture Collection, field samples and several manuals to allow us training on the identification. In addition, some lecturers brought their own culture samples; fortunately most of them survived the journey! Phytoplankton taxonomy is quite complex and may require advanced techniques but a lot can be learnt with basic means.

I have completely discovered the world of marine diatoms, their wonderful and diverse shapes. But the dinoflagellate section was of course the most enjoyable part for me as it is related to my research area!

This workshop had a warm and friendly atmosphere, with 20 attendees from 9 nationalities: British, Dutch, French, German, Czech, Croatian, Portuguese, Chilean, Canadian and



Participants to the 1st Marine Phytoplankton Taxonomy Workshop



Australian. It was a very enjoyable cultural exchange especially the typical British quiz night followed by the Chilean traditional dances. I also enjoyed hearing the Latin name of algae pronounced with the different accents especially the typical Italian and Croat ones! Moreover, the MBA is situated on the seafront of Plymouth and I loved to look everyday at the sea, the boats, ferries and the submarine stationed in the bay!

I am extremely grateful to the British Phycological Society for supporting my attendance to this workshop. It allowed me to acquire new skills highly relevant for my career and develop new contacts in my field. I am also very thankful to my supervisor Gill Malin who supported my application, and also to the organising committee for setting up this valuable workshop.

## Collecting and Identifying Seaweeds in Pembrokeshire, Wales

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I boarded the ferry in Roscoff, France, embarking on the first leg of the journey to Pembroke and the seaweed course led by Francis Bunker and Chris Maggs. A few trains and a taxi later, I was in Wales ready to begin. I had two main objectives to achieve from the course. Firstly, all my previous research was conducted along the coast of California. Despite two fellowships in Germany and France, I knew a very limited amount of the North Atlantic flora. Therefore, this course provided an excellent opportunity to increase my knowledge of the common seaweeds I will encounter while conducting my field work in the intertidal zones of northern Europe. Secondly, I am currently at work on my dissertation under the co-direction of Drs. Myriam Valero (Station Biologique de Roscoff) and Juan Correa (Pontificia Universidad Católica de Chile) studying the population biology of the red macroalga *Chondrus crispus* at the Station Biologique de Roscoff. One of the objectives of my thesis is to study the population structure of *Chondrus* along its latitudinal range. Therefore, the course also presented an opportunity to collect specimens from Wales myself.

On the first day of the course, my fellow participants and I crowded into the Hundleton Community Center under skies threatening rain. We were given lectures by Francis and Chris which were a great refresher to some of the information that had become a bit foggy since I took phycology. Then, we set out for Neyland Marina to collect samples from the pontoons. We tucked into fabulous sandwiches prepared locally at The Cornstore café before donning our life jackets. We spread out en masse on the dock to the bemused look of some of the people tinkering on their boats. Upon filling up Ziplocs

with all sorts of seaweeds, we returned to the community center to begin keying out species. The afternoon concluded with a meal again prepared by The Cornstore in the little kitchen of the Community Center. Microscopes and algae pushed aside, we were able to discuss our projects and purposes for enrolling in the course.

The following day, we spent a few enjoyable hours clamoring over the jagged rocks and slipping into tide pools to add to our collections at West Angle Bay. Upon returning to our makeshift lab, we spent the remainder of the day identifying species, adding them to our growing list. We were given demonstrations on the differences between *Polysiphonia* and *Ceramium* and preparing herbarium specimens before enjoying a meal of lasagna prepared by the same caterers. The final day was spent identifying the remaining samples from West Angle Bay. Before cleaning up all the equipment and goodbyes, we enjoyed a final delicious lunch of sandwiches and cakes.

The course was incredibly rewarding and extremely worthwhile. I lugged home my bag stretched to capacity with a flower press bulging with species new to me and bags filled with silica gel containing *Chondrus*, *Gracilaria* and *Laminaria* for my own research and colleagues at Roscoff. I would highly recommend the course to anyone that wants to learn about seaweeds or improve their knowledge of local flora. Francis and Chris imparted their knowledge and led the course efficiently, managing to cram a lot of information into the space of two and a half days while keeping the course laid back and informal. Many thanks to Francis for collecting subtidal samples and Chris for making an evening collecting trip for some more samples to take back to Roscoff. I would also like to thank BPS for the student bursary that helped defray the costs of attending the course.





# The Big Seaweed Search



Unlike flowering plants, seaweeds have never attracted a large amateur following, but is this about to change? On August 21<sup>st</sup> this year at Wembury, South Devon, The Big Seaweed Search was launched. The Big Seaweed Search has two main aims: i) to get more people interested in seaweeds and ii) to obtain data on a wide scale to find out what is happening to some of our most conspicuous species in the UK, particularly the zone-forming brown algae. The project was developed in partnership with Open Air Laboratories (OPAL), an initiative supported by the Big Lottery Fund that aims to get everybody involved in exploring, studying and enjoying their local environment.

([www.OPALexplorenature.org](http://www.OPALexplorenature.org)).

So how does the project work? It asks people to go for a walk along their chosen seashore at any time of the year and to record 12 kinds of seaweed. These include the intertidal zone-forming brown seaweeds: *Pelvetia canaliculata*, *Fucus spiralis*, *F. vesiculosus*, *F. serratus*, *Ascophyllum nodosum* and *Himantalia elongata*; species which may be decreasing or at the edge of their range: *Bifurcaria bifurcata* (southern), *Alaria esculenta* (northern) and *Saccharina latissima*, and a non-native, *Sargassum muticum*. Also included are *Corallina* species, of interest in relation to ocean acidification, and *Ulva* species, much in the news at the time of writing because of huge quantities washed up on some beaches and releasing hydrogen sulphide during their decomposition. People are also asked to count the number of limpets they can find in 1 minute. There is evidence that some of the large brown algae may be disappearing from our shores and that this might be related to warmer winters and the overwintering of grazers, preventing the establishment of algal sporelings.

The idea for The Big Seaweed Search was inspired by the annual garden bird survey run by the Royal Society for the Protection of Birds and I'm hoping that with time, the seaweed survey will become similarly established. However, a major problem for the seaweeds is the lack of common names for the majority of species, a subject which has been raised in recent years at Biodiversity and Conservation committee meetings. This really struck home at Wembury. The launch took place during a 24 hour 'Bioblitz', organized by OPAL, where as many different species of organisms were recorded as possible. People of all ages, particularly children, were coming up to me to ask the names of some of the beautiful seaweeds on the beach and all I could tell them was a long, Latin binomial. I think using common names would make a huge difference in our ability to communicate and inspire young people who are clearly taken by these weeds on the shore.

This project has received invaluable help from the Biodiversity and Conservation Committee of the BPS and in particular Christine Maggs and Francis Bunker who have supplied ideas, text and photographs for the survey guide. The resources for The Big Seaweed Search, including identification guides, recording sheets and a website were developed with the help of John Tweddle and Lucy Carter of the OPAL team and the Natural History Museum web team.

We would also like you to help us to get the project out as far and wide around the UK as possible. For free identification guides you can contact Lucy Carter, [L.carter@nhm.ac.uk](mailto:L.carter@nhm.ac.uk), or for further details go to the website <http://www.nhm.ac.uk/seaweeds>.

Juliet Brodie  
Natural History Museum, London  
August 2009

# *Aegagropila linnaei* Kuetzing at Loch Watten, Caithness, Scotland

About twenty years ago, when I worked at the then Highland River Purification Board in Dingwall, I came across a freshwater loch (Loch Watten) in Caithness, which had large numbers of green spongy balls washed up around its eastern end. The balls were up to several centimetres in diameter, and I identified it at the time as *Cladophora aegagropila* (Linnaeus) Rabenhorst. This was confirmed by Dr. Martin Wilkinson at Heriot-Watt University. The taxon is now regarded as *Aegagropila linnaei*. While similar in appearance to a *Cladophora*, it has been assigned its own monotypic genus based on genetic evidence and morphology (e.g. Boedeker & Immer, 2009). In August 2008, for the first time since, I revisited Loch Watten and again found a swathe of balls washed up in the same location (Fig.1). This time they were mostly small, up to 1.5cm in diameter, but with a few larger balls, up to 4.5cm in diameter (Fig.2), more like those found on the first occasion. Many of those washed up had dried out and were now brown in appearance (Fig.3). Diameters up to 20-30cm have been quoted in the literature, but not in the U.K. Knowing that Christian Boedeker of the National Herbarium of the Netherlands was looking for material and records of *Aegagropila*, I sent him a sample. DNA analysis confirmed it as *A.linnaei*, and my thanks to Christian for this.

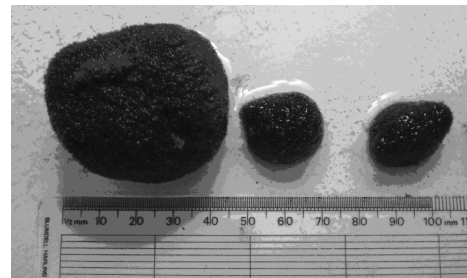
Loch Watten lies between Thurso and Wick, in the north-easternmost corner of Scotland. The loch runs west to east, and the prevailing wind direction is south/south-westerly, hence the accumulation of algal balls at the eastern end, where it is shallow. This habitat conforms with descriptions in the literature for free-living balls (e.g. Brodie et al. 2007; Boedeker & Immer, 2009) of balls forming in shallow waterbodies where wind driven currents and water motion lead to the development of detached balls of algae rolling around. It can withstand low light levels and low temperatures. I can confirm this, as a specimen survived in a container in my fridge for a year, and was still quite healthy when I examined it again recently. Far from being a hollow ball, it was a compact mass of dense filaments and about 3cm in diameter. "Lake balls" are becoming popular in the aquarium trade, and their popularity in Japan leads to them being kept as "pets". I can see why, as the ball form is quite intriguing.

Though the species can occur as attached or unattached floating forms, it is the ball form which seems to capture the attention. Iceland impressively issued a stamp last year with lake balls as the subject, and there is also a Japanese stamp. Although widespread, "lake balls" are not common, presumably due to their specific habitat requirements, and the plant in all forms seems to be becoming scarcer (Boedeker et al. In prep.). Where the balls occur, they can be regarded as something special. In Japan a three-day marimo (lake balls) festival is held at Lake Akan, and marimo seem to be part of popular culture. An extensive population of "lake balls" at Lake Myvatn in Iceland has declined significantly, and *Aegagropila* is now a protected species in a number of countries. It would be interesting to gather more information on its occurrence in the U.K..

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Clare Scanlan  
Scottish Environment Protection Agency



From Top to Bottom:

Figure 1: *Aegagropila* balls washed up at Loch Watten, Caithness

Figure 2: *Aegagropila* balls

Figure 3: Dried out *Aegagropila* in the field

Figure 4 Photo of *Aegagropila linnaei* showing branching



# Kathleen Drew-Baker Award

With gratitude and delight I was pleased earlier this year to receive a message from Eileen Cox, the Editor in chief of the *European Journal of Phycology* advising me that our paper "In situ photosynthetic rates of tropical marine macroalgae at their lower depth limit" was judged to be the best paper of 2008. Of course this paper was only possible with the significant contributions from my co-authors Prof. Karla McDermid, University of Hawaii at Hilo, and Dr Carlos (Fred) Gurgel, now at the University of Adelaide, South Australia. How we came to assemble the data for this paper on such a rarely visited topic is a story in itself. Something along the lines of being in the right place at the right time.

In 2003 I was finishing up a two year research project at the Hawaii Institute of Marine Biology. At this time, Karla and I discussed the possibilities of investigating some of the deeper macroalgae using the Hawaii Undersea Research Laboratories submersible facility, and we put in a proposal.

Around this time I had started *in situ* fluorescence studies on Antarctic macroalgae with Dr Martin Riddle of the Australian Antarctic Division (AAD). For the early work I used a Diving-PAM which was essentially limited to in situ data representing the physiological condition of the algae at the time of measurement. Field experiments in the Antarctic focussed on the effects of a rapid and marked change in underwater insolation when the sea-ice broke out. In situ measurements for 24h+ periods with the multi-channel fluorometer showed significantly different changes in  $\Delta F/F_m'$  of under-ice macroalgae, despite these algae experiencing a maximum daily irradiance of only  $10 \mu\text{mol quanta m}^{-2} \text{s}^{-1}$  (Runcie and Riddle 2004, 2006). The success of this device led us to design and develop a simple yet effective modular fluorometry system; I then used these fluorometers (with minor modifications) to 201 m depth.

The deepwater paper addressed the *in situ* photosynthetic responses of a variety of macroalgae from depths between 86 and 201 m. Only with the patience and skill of the submersible pilots was it possible to accurately position several tonnes of submarine and the attached fluorometer probe to take modulated PAM-style fluorescence measurements of selected macroalgal thalli. The paper discussed our observations of a) algal distribution across the depth gradient, b) their capacity to conduct electron transport at relatively high irradiances, and c) the stable carbon isotope ratio of collected specimens.

Although the water at Penguin Banks was very clear ( $K_d = 0.46$ ), the depth limits of most species were shallower than limits reported in other studies, possibly due to occasional smothering by sand. *Ulva expansa* thalli could be found to 120 m depth. We found a clear line at 140 m depth with the red foliose algae in particular extended down to this 140 m limit. Below this, no foliose algae could be found and only coralline encrusting algae were present. Of most interest was the calculated  $E_k$  value derived from an in situ irradiance treatment;  $E_k$  is believed to essentially represent the irradiance where maximum electron transport rate is attained. The encrusting coralline algae at 200 m demonstrated  $E_k$  values orders of magnitude greater than ambient maximum irradiance, suggesting these algae maintain the capacity to

conduct electron transport - and hence photosynthesis - that is required at much shallower depths. Thus their photosynthetic capacity for very short term acclimation to high irradiance can be described as constitutive rather than induced. This has significant implications for these ubiquitous algae, and may offer a clue as to why they can be found in both the brightest and darkest environments in the shallow subtidal as well as deepest waters. Finally, the carbon isotope analyses confirmed that while the relatively slow diffusive flux of inorganic carbon into some of the deeper species was the primary source of carbon for photosynthesis, its slow rate matched the relatively low demand for carbon.

While this paper describes *in situ* modulated fluorescence measurements of a range of macroalgae at their lower depth limit, we are also working up the species identification data, and have revisited the area to collect further specimens for pigment analysis. Our recent finding that many expected species were absent on the Penguin Banks in Spring (the paper reports work in Autumn), suggest to us a major seasonal differences in the distribution of many of these macroalgae, with quite significant implications for the ecology of these deepwater algae. While little is known about these deepwater biological systems, the gradual incursion of shallow-water technology into the deeper realms is providing more insight into the ecology and physiology of deepwater macroalgae.

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Dr John W. Runcie  
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AUSTRALIA



## New Investigator Award

I was thrilled to be awarded the young researcher prize from the *European Journal of Phycology* for my paper on the overwinter survival of *Planktothrix rubescens* from Lake Zürich. This study relied on a simple experiment - isolating individual filaments of *Planktothrix* and seeing how long they remained viable in complete darkness - which allowed us to not only identify the longer than expected survivability of this organism, but to use this information to estimate the depth from which filaments could float whilst remaining viable. This is important because it allows us to better model growth and recruitment over spring and summer, when Lake Zürich is thermally stratified, and to speculate about the selective pressures on different phenotypes as global warming occurs.

I thank the editors of the *EJP* for the recognition they have given me, and Taylor & Francis for their generous sponsorship of this award. I am especially pleased that they have chosen to present an award specifically for young researchers; we need all the help that we can get. I also thank my co-author and PhD supervisor, Tony Walsby. While I expect that he is ineligible for this particular award, his input into this paper was substantial, and without his attention to detail I doubt that the paper would have won.

Since completing my PhD at the University of Bristol, I have returned to my home country, Australia, where I have taken up a postdoctoral position at Monash University. I continue to study the ecophysiology and ecology of cyanobacteria. I have enjoyed a fruitful relationship with the British Phycological Society, and I hope to continue this, even though I am now based on the opposite side of the world, and despite the unbearable smugness - from the English in particular - that I have had to endure following the recent Ashes series. I look forward to contributing further to the *EJP*, and I hope for the opportunity to attend future winter meetings.

**Daryl Holland**  
**Water Studies Centre & School of Biological Sciences**  
**Monash University**  
**Australia**





# An Unknown Filamentous Brown Alga (Phaeophyceae) from a Domestic Freshwater Aquarium in Northampton UK

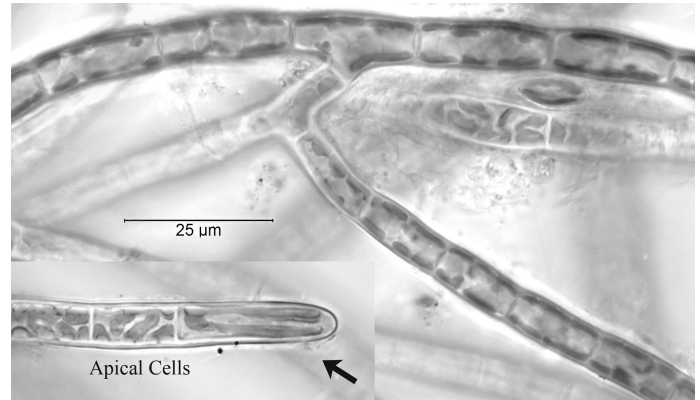
Small brown tufts up to 3mm high were first seen by one of us (CFC) growing in a domestic tropical freshwater aquarium used for Angel fish (*Pterophyllum*) in a house at Wootton, Northampton. It was thought at first that these might be the chantransia stage of a red alga such as *Batrachospermum* but on further investigation they proved to be branched filaments of a member of the Phaeophyceae (brown algae) superficially resembling a species of the marine alga *Ectocarpus*.

The water was fresh, with the conductivity stable at 1200µS/cm at the aquarium temperature of 23°C. Dissolved solids, mostly calcium salts, of the "hard" water measured 590ppm, so we deduced that the salinity could not have been more than 0.02%, compared to 3.5% for typical sea water. The tufts of algae were growing in a distinct current owing to the proximity of a water filter.

The sparsely branched uniseriate filaments were about 8µm diameter, the length of the cells varied from 15 to 20µm and the wall thickness was about 0.5µm. The brown chloroplasts were band shaped and very convoluted, but in the rather elongated apical cells two to four ribbon shaped ones could be clearly distinguished, extending for most of the length of the cell. Pyrenoids, conspicuous in chloroplasts of *Ectocarpus*, were not present. The alga has been isolated into unialgal culture and grows also in both half and full salinity 'Provasoli' enriched sea water at 18-24°C. No reproductive structures have been seen to date in any condition but the alga is still present (August 2009) in the aquarium and is examined regularly.

In the hunt for references or expertise that could lead to an identification of the specimen we have consulted the Fritsch Collection of Illustrations of Freshwater Algae, presented a poster at the "Ectocarpus 2008" conference at Oban in June 2008 and consulted widely with international brown algal specialists. Our plant resembled illustrations of *E. siliculosus* (Dillwyn) Lyngbye which was collected from a waterfall on the Hopkins River, Western Victoria (West & Kraft 1996); probably one of the few truly freshwater records of *Ectocarpus*. Perhaps in a small way the turbulent flow near the aquarium filter resembled the Australian habitat.

In the absence of reproductive structures it appeared that only DNA analysis could help to identify the specimen so it was fortunate that one of us (AFP) was in a position to attempt this. The DNA has been extracted at the Marine Biological Association, Plymouth. In a first sequencing attempt, 180bp at the end of the nr SSU gene were obtained; however, in this part of the gene containing two more and one less conserved sectors, the *Ectocarpus* sequences available from Genbank showed 26 different nucleotides (concentrated in the less conserved sector). In contrast, the Genbank sequences of the known freshwater brown algae *Bodanella lauterborni* and *Heribandiella fluviatilis* differed from our alga's sequence by only one base substitution. The result gave confidence that our alga indeed belonged to the Phaeophyceae. In a second sequencing attempt, 971bp of *rbcL* were determined. To our surprise, *Bodanella* and *Heribandiella*, for which we possessed unpublished *rbcL* sequences, were quite different from our alga; in a



parsimony analysis including *Phaeothamnion confervicola* and *Schyzocladia ischiensis* as outgroups and 16 taxa from all lineages of brown algae (mostly taken from Kawai et al. 2007) our alga clustered with *Ishige okamurae* and *Petroderma maculiforme* rather than with *Bodanella/Heribandiella* which in turn clustered with *Phaeostrophion*, *Syringodermata*, *Sphacelaria* and *Onslowia*. The statistical (bootstrap) support for the affiliations obtained was weak, though. Evidently the sequences so far produced are insufficient for a proper molecular classification. It appears nevertheless likely that our alga is a so far undescribed species not belonging to the Ectocarpales.

Where the original alga came from of course is a mystery and we wonder how many other algal species of interest are growing in freshwater aquaria in this country? This is quite important, since the contents of aquaria are often tipped out into the wild where their inhabitants may or may not survive, from red-eared terrapins, *Craspedacusta* jellyfish and plants such as *Vallisneria spiralis* to many smaller forms. In a warmer climate our alga may yet become one of these 'alien invaders'.

Hopefully we will be able to publish a fuller account and formal description in due course but in the meantime we propose the provisional name *Ectocarpoides piscinalis* nov. gen. et sp. for this alga.

Thank you to Dr Liz. Howarth and Elaine Monaghan at the Fritsch collection at Windermere, Cumbria; also to Prof David John, Dr John Wehr, Dr Declan Schroeder, Dr Frithjof Kuepper and Dr Gerald Kraft for their comments and advice.

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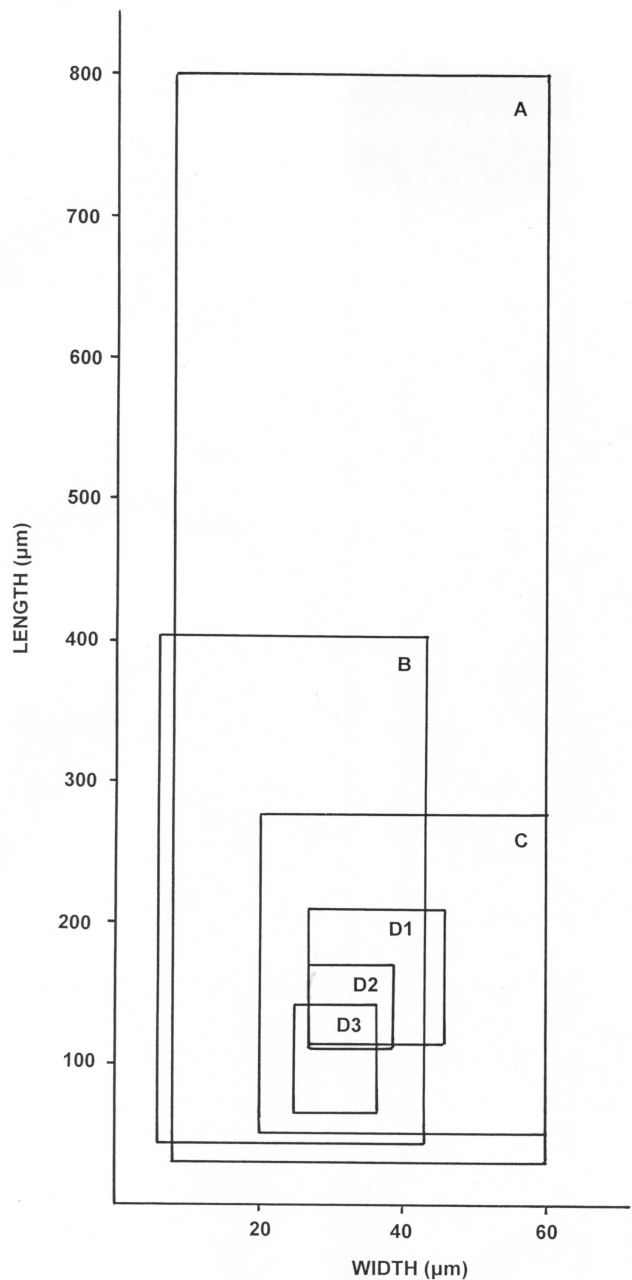
# Forty years on: *Ectocarpus* revisited

The revival of interest in *Ectocarpus* taxonomy fuelled by advances in molecular techniques has exposed the limitations of morphology, the traditional means of taxon discrimination in the genus. There is, I gather, an ongoing search for morphological traits to characterise particular genotypes despite the growing evidence for the existence of cryptic species. Given that numerous genes will be involved in *Ectocarpus* morphology, including those implicated in plastic responses to the external environment, any links between genotype and phenotype may well prove to be both elusive and approximate. So, is analysis of *Ectocarpus* morphology simply pointless activity? The following observation on three fairly isolated populations of *E. siliculosus* s. lat. in N.W.England may suggest a continuing role for morphology outside taxonomy.

Taxonomic accounts of the of *E. siliculosus* complex have usually relied rather heavily upon sizes and shapes of plurilocular sporangia and the resulting data are often expressed in the form  $w-(x-y)-z$  where  $w$  and  $z$  are presumably the smallest and largest dimensions recorded with  $x$  and  $y$  the range of those most frequently observed. There is seldom, if ever, any indication of the number of plants and sporangia examined or the contribution, if any, made by natural populations to the distribution of data.

The locations of the three populations under consideration are as follows: Hilbre Island at the mouth of the R. Dee, New Brighton at the mouth of the neighbouring R. Mersey and the Liverpool South Docks, also in the Mersey. The Hilbre site is tidal and subject to strong wave action from the westerly quarter. New Brighton, also tidal, is moderately exposed to the north mainly, but the docks are non-tidal and permanently calm. Thirty six *E. siliculosus* thalli were sampled at irregular intervals throughout the year; 14 from Hilbre, 13 from New Brighton and 9 from the docks. The lengths and widths of 843 mature plurilocular sporangia were measured and the results are given in the line diagram. Box A represents the extreme values ( $w$  and  $z$ ) recorded in the literature for mainland Europe and box B shows the extremes for the British Isles (R. L. Fletcher mscr.). The extremes for the combined local populations are given in box C. Boxes D1, D2 and D3 show the smallest and largest mean values ( $x$  and  $y$ ) for the Hilbre, New Brighton and dock populations respectively. The dock sporangia were significantly shorter than those from the tidal sites, though the sample size was small.

The results indicate a reduction in the range of variation with geographical area and, as might be expected, a marked contraction when means are calculated and sampling restricted to individual populations. There is a kind of pattern here suggesting that if sporangial morphology has become less important in *Ectocarpus* taxonomy, it remains an interesting element in ecological studies. Ecomorphology does not seem to have had a strong impact on phycology, though it features



quite widely in other natural sciences. Maybe we should have given it a little more attention.

I must express my thanks to Dr. A.F. Peters for reigniting my interest in this fascinating alga.

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# A new collection of *Alexandrium* cultures available at the Culture Collection for Algae and Protozoa

The Culture Collection of Algae and Protozoa (CCAP) located in Oban, Scotland is one of the leading repositories of algal cultures in the world. A new collection of cultures of the potential shellfish toxin producing dinoflagellate *Alexandrium* (Halim) is now available for purchase. This collection was generated during a three year research project performed by Marine Scotland Marine Laboratory, Aberdeen, funded by the Scottish Government and the EC 6<sup>th</sup> Framework project SPIES-DETOX. A total of 33 *Alexandrium* cultures were generated from water and sediment samples collected around the Scottish coast (see map). These include 9 cultures of *A. tamarense* (Group I), 16 cultures of *A. tamarense* (Group III), 4 cultures of *A. ostenfeldii*, 3 cultures of *A. minutum* and 1 culture of *A. tamutum*[<sup>1</sup>, <sup>2</sup>].

Toxin analysis of the *A. tamarense* (Group I) isolates by LC-MS-MS, revealed the profiles to be dominated by the potent carbamate toxins STX, NEO, GTX-4, GTX-3 and the N-sulfocarbamoyl toxins GTX-5 and C2. Some *A. ostenfeldii* cultures were shown

to produce both PSP toxins and spirolides, while others produced only spirolides. *A. tamarense* (Group III), *A. tamutum* and *A. minutum* were not observed to produce toxins under the incubation conditions used. Molecular analysis of the LSU was performed on a selection of these cultures[<sup>1</sup>,<sup>2</sup>] with sequences submitted to GENBANK.

The *Alexandrium* cultures are now available to the international scientific community. Information on obtaining the strains and supplementary information e.g. Genbank accession numbers and toxin profiles will be supplied from the CCAP website ([www.ccap.ac.uk](http://www.ccap.ac.uk)). Fluorescent images of the thecal plate structure are also available upon request from the author.

Marine Scotland Marine Laboratory and the Scottish Association for Marine Science are continuing their investigations into the ecology of *Alexandrium* in Scottish waters through a NERC funded Ph.D. studentship and a Scottish Government funded research project.

For further information about these

cultures please contact Christine Campbell, Culture Collection of Algae and Protozoa, email :

Christine.Campbell@sams.ac.uk, ph -44-1631 559000

Acknowledgements:

These cultures were generated under the Scottish Government ROAME AE1193 and the EC 6<sup>th</sup> Framework Programme project SPIES-DETOX (030270-2).

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**E. Bresnan<sup>1</sup>, C. Collins<sup>1</sup>, E. Turrell<sup>1</sup>, L. Brown<sup>1</sup>, J. Graham<sup>1</sup>, A.L. Amorim<sup>1</sup>, J-P Lacaze<sup>1</sup> and C. Campbell<sup>2</sup>**  
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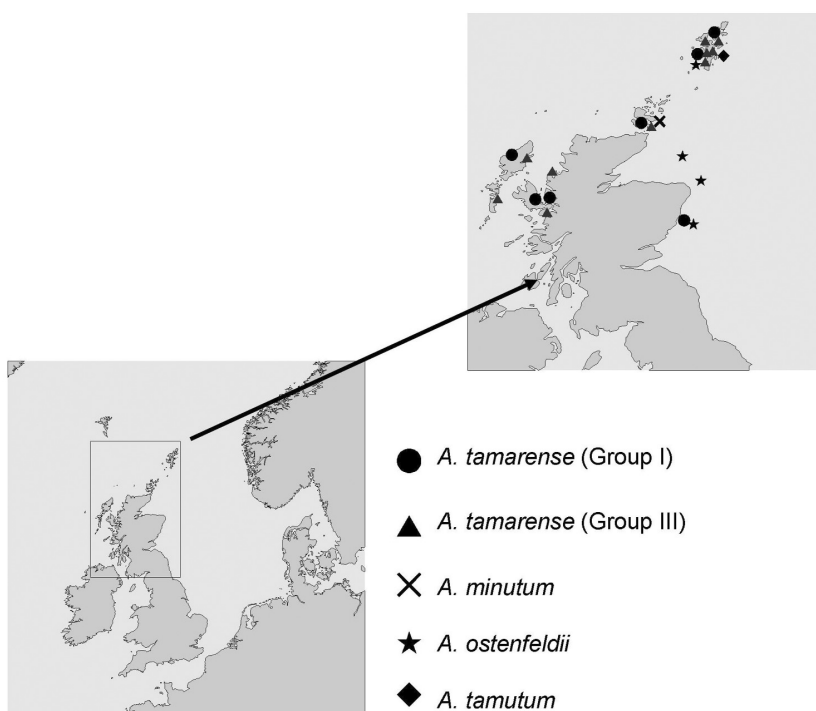


Figure 1. Map showing geographic origin of *Alexandrium* picture.

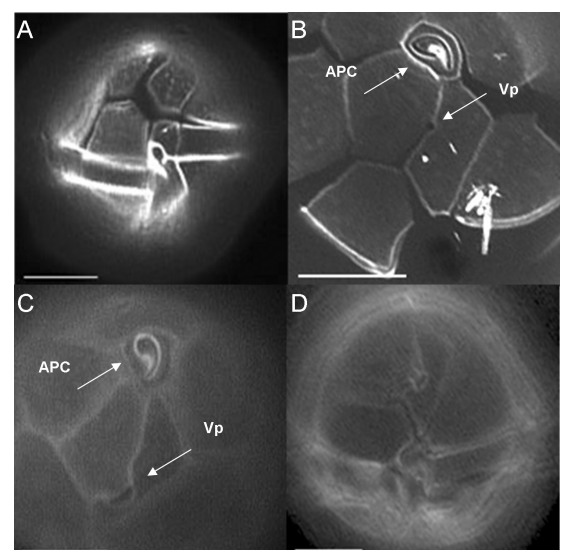
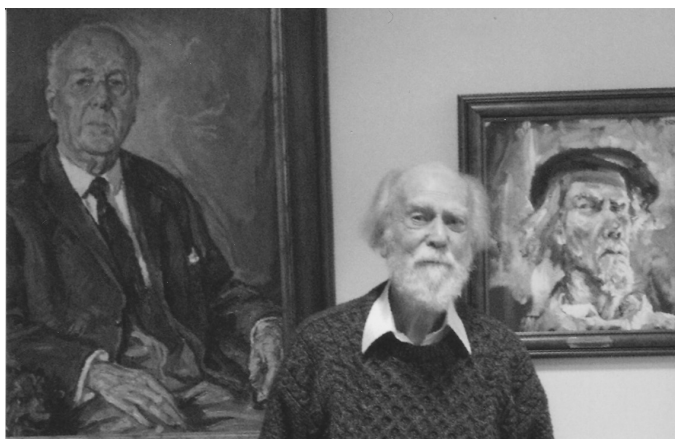


Figure 2. *A. tamarense* (A and B) and *A. ostenfeldii* (C and D) showing the apical pore complex (APC) and ventral pore (Vp). Scale bar 10 µm.

# Pringsheim and Droop reunited at CCAP



**Dr Michael Droop stands between his own portrait and that of Prof. Ernst Pringsheim, the Father of CCAP**

Anyone entering the laboratory of the Culture Collection of Algae and Protozoa at Oban will encounter two striking portraits, those of Professor Ernst G. Pringsheim and Dr Michael R. Droop, both important figures in the history of CCAP and of phycology.

The painting of Pringsheim was commissioned by a group of friends and former colleagues some time after he had returned to Germany and was painted by an acquaintance of Pringsheim's, Gottlieb Stein. In 1970 a purpose-built facility for what was then the Culture Centre of Algae and Protozoa was opened in Storey's way, Cambridge, and Pringsheim's portrait was hung there.

Correspondence relating to the portrait is held in the CCAP archives and makes fascinating reading. The portrait itself cost 1000 Deutschmarks, of which the University of Göttingen contributed half. The balance of £ 52 7s 3d in old money was raised in the U.K. by an appeal, the surplus being more than sufficient to pay for incidental expenses. The list of contributors to the appeal includes many famous names in the annals of phycology, such as Eric George, Tony Fogg, Michael Droop, Maud Godward, Gordon Leedale, Joyce and Ralph Lewin, John Lund, Mary Parke, Luigi Provasoli, Roger Stanier, Richard Starr and Samuel Hutner. The cost of framing the portrait was £65 - a considerable amount of money in those days - and it was paid for by the Natural Environment Research Council. A letter dated February 1970, from a mandarin at NERC HQ, states sternly, "The approval is given exceptionally and I am asked to say that Headquarters should have been consulted before any firm commitment was entered into and that we should probably have insisted that an estimate of £65 for framing was excessive in relation to the cost of the portrait."

Pringsheim's collection of algae, assembled while he was a member of the Botany Department at Cambridge, formed the nucleus of the CCAP collection and he is regarded as the Father of CCAP. His life's work is reviewed in his obituary<sup>(1)</sup> and he is perhaps best remembered nowadays for his classic monograph on techniques of isolation and cultivation entitled *Pure Cultures of Algae*<sup>(2)</sup>, which ran to several editions.

The self-portrait of Michael Droop was painted in 1984. In 2008 he was persuaded by a friend and former colleague to donate the portrait to CCAP, a gift that was readily accepted. It

was unveiled by the artist at an informal ceremony held shortly after his 90<sup>th</sup> birthday in November 2008. Present were CCAP staff, former colleagues and representatives of the Scottish Association for Marine Science. The picture hangs next to that of Pringsheim and it is appropriate that the two men have been reunited in this way as Pringsheim was Droop's research supervisor in the Botany Department at Cambridge University in the early 1950s.

The existence of the collection of microalgae built up by Michael, which he always regarded as a working collection, was a key factor in the decision to relocate the marine algae in the CCAP collection to the Oban laboratory of what was then the Scottish Marine Biological Association, although Michael had retired by that time. This relocation was the outcome of a strategic decision taken by the NERC in the mid-1980s. It was decided to close the facility in Cambridge and disperse the collection to two centres where there were already small culture collections and where research was actively being undertaken; the collections of freshwater algae and of protozoa went to the Freshwater Biological Association in Cumbria. The various collections were reunited in 2004 at the newly-built European Centre for Marine Biotechnology at Oban. CCAP is now one of the largest and most diverse collections of its type in the world.

Michael Droop is best known for being one of the originators of the Cell Quota model for conserved nutrients and algal growth, similar conclusions being reached independently by John Caperon<sup>(3)</sup>. However, as Michael has pointed out, this quota model was the outcome of a desire to settle a controversy as to the likely ecological importance of vitamin B<sub>12</sub> (cyanocobalamin) to phytoplankton<sup>(5)</sup>. In recent years he has felt moved to respond both eloquently and convincingly to a challenge to the Cell Quota model<sup>(4)</sup> and to the contention that in the natural environment algae acquire vitamin B<sub>12</sub> solely through a symbiotic relationship with bacteria<sup>(6)</sup>. A detailed account of his life and work was published in 2006<sup>(6)</sup>.

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# British Psychological Society 58<sup>th</sup> Winter Meeting, Oban 2010



## First Circular

The 58<sup>th</sup> Winter Meeting of the British Psychological Society will be hosted by the Scottish Association for Marine Science (SAMS). It is planned to hold the BPS Council meeting on the afternoon of Wed 6<sup>th</sup> Jan. The meeting will start with an informal reception on the evening of the 6<sup>th</sup> in Oban. The formal sessions of the meeting will be held at SAMS (Dunbeg) on the 7<sup>th</sup> & 8<sup>th</sup>. The meeting will end with the conference dinner and auction on the evening of Fri 8<sup>th</sup> Jan. (Fuller details of the scientific and social programmes will be included in the second circular and hosted on both the BPS [www.brphycsoc.org/meetings.lasso](http://www.brphycsoc.org/meetings.lasso) and CCAP [www.ccap.ac.uk](http://www.ccap.ac.uk) websites). Delegates should make their travel plans to return home on the 9<sup>th</sup>.

There will be two special sessions during the meeting: "Productivity and photophysiology" organised by Dr Rupert Perkins (Cardiff). Agreed speakers include: Prof John Raven (Dundee), Prof Dieter Hanelt (Hamburg) and Prof Johann Lavaud (Konstanz). The second special session: "Host pathogen interactions" organised by Dr Claire Gachon (SAMS). Agreed speakers include: Prof Gwang Hoon Kim (Chungnam, Korea), Dr William Wilson (Bigelow) and Prof Telesphore Sime-Ngando (Clermont Ferrand). Other special session speakers still to be confirmed (details in 2<sup>nd</sup> circular).

The Overseas vice President, Prof Patrizia Albertano (Rome) will give her vice-presidential address. In addition, there will be a special student lecture on multivariate statistics (tbc) as well as the usual Manton prize presentations.

## Abstracts

In order to finalise the scientific programme, contributors should complete and return the abstract form by 2<sup>nd</sup> October 2009. Please indicate whether you are offering an oral or poster presentation. Students should indicate whether they are entering the Manton prize or student poster sessions. Offered oral presentations should be planned to last 15 min with 5 min for questions. Presenters should bring their presentations on a memory stick (not CD), in a PC compatible form, ensuring that the file is clearly labelled with their name.

Posters should be prepared to fit a maximum size of 85 cm wide, 120 cm high (portrait layout). Larger posters can not be accommodated. Students should clearly indicate if they wish to be entered for the student poster prize.

Please send your abstract electronically as a word document (see BPS website for details).

## Registration

Registration forms and on-line payment by credit card will be available from early October. The costs of the meeting will include tea, coffee, lunches, receptions, evening meal/conference-dinner and bus transfer to/from central Oban to SAMS. However, this will not cover the costs of accommodation or breakfast. Advice on accommodation, (including details of discounted reservations in local hotels) and travel from central Scotland to Oban will be provided in the second circular.

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## First notice of the 29<sup>th</sup> Conference of the Polish Psychological Society

The Conference will be held in Kraków and Niedzica in the Pieniny Mts., Poland 19-23 May 2010, we hope that you will be able to attend the conference.

Details of invitations and a first circular are available at:

<http://www.botany.pl/29ConPhyt/29conf.html>

Contact:

Prof. Konrad Wolowski

Chairman of Organizing Committee

## International Phycological Society - Student Grants for Travel or Research

The International Phycological Society (IPS) has initiated a new program of Student Grants, to encourage more students to become members of the society. The IPS will award up to eight IPS Student Grants of US\$500 for travel or research annually. The awards are for

- Travel to meetings including workshops in which the student is presenting work on algae, whether the meeting is phycological or more general (e.g. evolution or ecology).
- Research projects on algae, which must be student-led with support from the supervisor.

### Eligibility of applicants

- Applicants must be graduate students, as verified by their supervisors.
- Applicants must be no more than 4 years from the start of their present studies.
- Applicants must be members of the IPS.
- For conferences and workshops, applicants must participate with a poster, talk or other significant contribution; for research awards, students must make the proposal.
- Only one application can be made per calendar year per student.
- Applicants agree to provide, for the IPS website, a photograph with a paragraph of text on their use of the award.

### Applications

- The application form is available on the IPS website (<http://www.intphycsoc.org/>).
- Closing dates are 30 May and 31 December each year, with up to four grants available for each deadline.

- Applications, on the application form, must be submitted to the Secretary of the IPS (currently Dr A.K.S.K. Prasad; email [Prasad@bio.fsu.edu](mailto:Prasad@bio.fsu.edu)).
- Applications must be accompanied by the following documentation:
  - evidence that the applicant is an IPS member
  - evidence of the venue and dates of the meeting, and costs of attendance, or
  - for research grants, budget for consumables/travel/bench fees.
  - 1-2 page c.v.

### Judging of applications and awarding of grants

- The Past-President of the IPS is responsible for the judging of applications by designating and chairing a judging panel.
- In cases wherein there are more applicants than can be funded, the criteria for ranking applications will include
  - The applicant's contribution to the conference, workshop or research project.
  - The applicant's personal statement in the application.
  - Applicant's c.v.
  - Broad international spread of successful grants.
- Payments will be made by US cheque via the IPS Treasurer.
- Successful applicants will, as soon as feasible, submit to the Past-President a short report on the result of their grant for the IPS website. They will also acknowledge IPS for the grant by including the IPS logo in their slides or poster.

## Wolfram Braune: Meeresalgen. A.R.G. Gabter Verlag K.G., 2009, 596 pp.

This book shows in 1010 coloured, magnificent photographs all major marine macroalgal species of the world. No book like this has appeared before and thus this book appears extremely valuable for phycologists and everybody interested in seaweed species of the world. Travelling throughout the world for 40 years, Prof. Braune brought together this treasure of seaweed pictures from the global coast line. The only disadvantage is that the book is written in German, and so only the algal names and the impressively clear colour photographs are of help to all non-German speaking readers who would certainly be fond to see soon the publication of an English version.

For each genus, the species with their illustrations are arranged in alphabetical order, and it is pleasure, e.g. for *Laminaria* fans, to see in this order the pictures of 9 out of the 40 or so *Laminaria* species of the world. For quite a number of species one finds up to 5-6 single photographs exhibiting details at different magnification or aspects from different seasons of a particular species. There are of course small taxonomic drawbacks like "*Laminaria saccharina*" instead of the modern citing as "*Saccharina latissima*", but such minor things do not appear important in view of the

wealth of information presented in this book. The text passages relating to each species contain information about morphology, thallus colour, thallus dimensions, zonal occurrence, possibilities of mixing up with another species, geographical distribution and, where important, commercial uses.

The book is completed by a taxonomical overview of all treated species, a glossary of scientific terms used in the book, and important literature citations or internet addresses for further reading. In view of increasing interest in worldwide marine macroalgal vegetation as an additional biomass resource to terrestrial plant biomass, this book will inform in detail not only phycologists and seaweed fans about the species composition of underwater vegetation, but also journalists and many other people active in the public domain, whenever they will stumble upon the possible commercial use of the underwater seaweed forests. But to come back to the beginning, the publication of an English translation is urgently required. The published price of the German book is EUR 39.00.

Klaus Lüning, Sylter Algenfarm, Germany



# Stefan O'Discus: trouble is his business

**Trouble or taxonomy. On the streets of LA it's sometimes hard to tell the difference. Down on those mean streets a man must go who is not himself mean; who is never tarnished or afraid. And who only occasionally lifts whole sentences from Raymond Chandler.**



The first time I laid eyes on her was on a Friday afternoon on one of the hottest days of the year. Too hot for anyone without a good reason to want to search out the services of a Taxonomic Investigator. But, then again, too hot for any self-respecting Taxonomic Investigator to venture out onto the sidewalk in search of a whiskey sour. So, I thought, better stay where you are, O'Discus, swat a few flies, watch the hands of the clock creep around and look forward to the cool of the evening.

And then she walked in. A brief ring on the buzzer in my outer office, the door opened, and there she was. I recognised her straight away. Anyone would. Anyone who had hung around Los Angeles for as long as I had would have known her. She was one of those upper-class broads, the type that hang around the exclusive oligotrophic habitats up in the hills, away from the eutrophic swamps with their milling hordes of commonplace diatoms. A million miles from the *Naviculas* and *Nitzschias* that made up most of the daily work of a Taxonomic Investigator. She was tall: 70  $\mu\text{m}$  at least, even without her stiletto heels, elegantly curved and with that distinctive unilateral swelling close to her central area.

"*Hannaea*", she said, "*Hannaea arcus*", as if I hadn't read the Hollywood papers for the last ten years. "I'm looking for someone who can help me." I gestured to the office chair and she sat down, more elegantly than I've ever seen anyone encased in a silica frustule sit down before.

I lit a cigarette, pushed back my own chair and asked her to tell me what was on her mind. "It's about my identity," she said, glancing nervously from me to the open window and back again. "I've got absolutely no idea who I am anymore." I nodded, thinking back to the time not so long ago when she was known to everyone in Hollywood as *Ceratoneis arcus*. She was the toast of the town, the diatom everybody wanted to have in their samples, the most memorable diatom on slides filled with unplaceable *Nitzschias*, *Cyclotellas* and *Gomphonemas* and who knows what else.

But then it had all gone wrong. No-one knew for sure, but there were some nasty rumours about the type species of *Ceratoneis*. The type of rumour that hung around a family like a noxious smell. According to the scandal sheets, the type species had walked out one day and wasn't seen again until it turned up calling itself *Nitzschia closterium* and refusing to have anything more to do with *Ceratoneis*. Or so the story went.

*Ceratoneis arcus* had disappeared from the scene for a while. But a year or so later she was back, as if nothing had happened, and calling herself "*Hannaea*". Still hanging out with that same exclusive crowd in the rarefied habitats that most of us could only dream about. Still as beautiful and elegant as she was when she called herself *Ceratoneis*. But, somehow, things were never quite the same.

So what, I wondered aloud, had brought her to seek out the services of a Taxonomic Investigator? She dropped her eyes to her unilaterally swollen central area, as if this was some kind of a clue. It wasn't. So I waited a little longer. It was not easy for her, that was obvious. Finally, she glanced up and said in a low voice, "people are telling me that I'm not really *Hannaea* at all".

I looked up sharply. This was not the first incident of this type that I had encountered. There was a turf war in this town that was leaving a lot of casualties in its wake. A gang of out-of-towners had moved in, exerting their muscle on generic limits. No-one minded, so long as they did it quietly and didn't impose their views. But then another gang had moved in, a gang, calling itself the Mitteleuropeans, that was shaking-up the town in other ways. No-one was safe anymore. First, it was

just the motile diatoms, the epipelagic lowlife. One minute it was *Navicula*, the next it could be *Placoneis*, *Sellaphora* or God knew what. And the next minute, the Mitteleuropeans had moved in, kicked *Placoneis* out and splattered the original binomial into half a dozen varieties.

"So who do they say you are?"

She bit her lip, barely able to suppress the emotion.

"They say," she started, before choking back a tear, "they say that I'm really a *Fragilaria*".

I was on my feet in a second. This was more than any self-respecting diatom could take. The aristocratic, monospecific name of *Hannaea arcus* subsumed into a catch-all genus like *Fragilaria*. The audacity took my breath away. I sank back into my chair.

"So what do you want me to do, *Hannaea*?"

She looked at me intently. For a moment the roar of the traffic outside, the sound of half a million people living their city lives, fell away to nothing. She had my complete attention.

"Mr O'Discus," she said, "I want you to prove that I'm not a *Fragilaria* and that I'm monospecific".

So where does a guy start a job like this? Cruising the boulevards of the edgier parts of town, where the epipelagic rub shoulders with cosmopolitan incomers with no clearly-defined ecological niche? That was where I was most likely to find the Mitteleuropean gang. They had caused terror and mayhem there for several years now: splitting genera, describing new species, and generally making all of us wish for the balmy days when Hustedt ruled the town. I got into my Oldsmobile and drove downtown, not entirely sure what I was going to find. In a town like this, however, an eye-catching dame like *Hannaea arcus* doesn't visit a seamy, small-time Taxonomic Investigator like myself without somebody noticing and word getting around. I had an unpleasant feeling that they would find me before I found them.

Waiting on a red light in the eutrophic end of town, I noticed a Mercedes with darkened windows pull up behind me and knew it had not taken them long. I

let them tail me for a few blocks before pulling into a vacant parking lot. The Mercedes purred to a halt beside me. The tinted window rolled down and a gutteral voice sounded from the inside:

"O'Discus." It was a statement, not a question. "Get in: the boss wants to talk to you." I sensed that declining this opportunity was not conducive to my long-term health. The back door of the Mercedes opened, I bent my head and climbed in. No sooner had I done so and the door was closed, than the car purred away. My eyes adjusted to the gloom in the back of the limousine. There was one other passenger; grey haired, moustachioed, dark glasses. I did not have to ask who it was. His accent was unmistakable.

"Mr O'Discus, I understand that you have been visited by a friend of mine?"

I neither confirmed nor denied. For what it was worth. He continued as if he already knew my answer.

"She is misguided. Beautiful but misguided. As are so many diatoms, I'm afraid. She has ideas. But no evidence. OK, so she has this elegant lunate shape, but is that really enough to separate her from a *Fragilaria*?" He put his face close to mine. "What, exactly, is a "genus"?" He spat out the last word in a voice loaded with irony. "Just a human construct. If I say she is not "*Hannaea*", who is she to argue?"

"Perhaps she likes being *Hannaea*," I interjected. "Perhaps she thinks *Fragilaria* is too common for her"

"You forget, Mr O'Discus." I have ways of persuading people. He motioned to the driver. "My people have a certain - how shall we say - reputation. One word from me and there will be another volume of *Bibliographica Diatomologica*. Your beautiful monotypic *Hannaea* will be smashed into so many species, subspecies and varieties that she will wish she had never visited you. Stop the car," he barked. The Mercedes pulled to the side of the street. "Mr O'Discus, I think I've told you all you need to know. Farewell."

It was an order. I climbed out, my hand smarting from the bodywork of the limousine superheated by the Los Angeles sun. I headed for the shade, lit a cigarette, and wondered why I had ever let that *Hannaea* dame seduce me into taking on her lost cause.

I found a cheap diner where I could drink a coffee and eat a sandwich. Then I caught a cab back to where my car was parked, drove back to my office, pulled down the blinds, got a bottle of rye from the office filing cabinet and thought out my next steps. If I had no luck convincing the Mitteleuropeans that *Hannaea* was, indeed, *Hannaea* and not just another *Fragilaria*, perhaps I had better try a different tack. I would have to talk to their rivals. I had two choices: Natural History Museum or Royal Botanic Gardens. I tossed a coin, got into my car and headed to the north side of town where the high-end taxonomists ply their trade amidst the Georgian terraces. These guys must make a lot of bucks from private practice, I thought, as I looked up at the science block. I went in and announced myself to the receptionist. "I'm looking for Professor Male. It's personal business," and sat down to wait. Twenty minutes later, I was ushered into an office where every spare surface was piled with papers and books. I sat down, uninvited, in the only empty chair in the room and lit a cigarette. The scholarly figure opposite looked up from the paper he was reading and scrutinised me. "You wanted to see me about someone called *Hannaea arcus*, I've been told. You do know, Mr O'Discus, that I don't usually concern myself with araphids such as her. I have a predilection for raphids."

Male's predilections were well known in Hollywood. The rumour was that he had a thing about watching diatoms have sex together. Just a rumour. But, in a town like this, rumours stick to a guy's reputation like chewing gum to the sole of your shoe.

"She's a client of mine," I explained. "Comes from a good family. She's worried that she may not be monotypic." I could see that I had his attention now. "I wondered if you had a view on this."

"In my opinion, Mr O'Discus, many diatoms think that they are monotypic but when we assemble all the evidence, we find that very few really are. Of course, in a town like this, you can get away with saying you are monotypic. All it needs, however, is an expedition to Lake Baikal and almost any monotypic genus can be shown to be a sham. "How well do you know this *Hannaea*



*arcus*?" He looked at me intently. "Not for very long, I would imagine. In your trade, I would imagine you rarely have a chance to develop an - how can I put this - intimate relationship with your clients. Are you sure that you are not actually dealing with *Hannaea arcus* agg.?"

He had caught me wrong-footed and knew it. His tone softened. "But perhaps you should bring her in so that I can meet her. We have, ahem, facilities. I could extract her DNA. She won't feel a thing." I let out a bitter laugh.

"Doc. I gotta hand it to you. The whole town knows about that *Sellaphora pupula* dame and the way you treated her. One minute she was *Navicula pupula*, next you told everyone that henceforth she was to be called *Sellaphora*. And then you start getting bold and say she's not plain *Sellaphora pupula* anymore but *Sellaphora pupula* agg. and she just fell apart. No thanks, Doc: I'm not going to let you do the same to *Hannaea arcus*. She's a high class dame. She's monotypic and I'm not going to let you or the Mitteleuropeans do anything to change that.

I rang *Hannaea* and suggested we meet at Victor's so I could tell her how I had got on. She was late, as these snooty oligotrophic dames think they have an obligation to be. She walked in when I was on my second gimlet, and slid into the booth beside me. It was as hot as ever outside and, inside, the ceiling fan moved the hot air from one place to another but didn't really make us any cooler. She, however, looked as fresh and lovely as the first day I had seen her. She took an age pulling off her white gloves and whispered an order to the old waiter who hurried off, bending forward. There was a guy who really had a mission in life.

I took another sip of my drink and looked straight at her. There wasn't an easy way for me to say this. I had failed. There were two gangs in town and both seemed determined to bend *Hannaea* to their will. I'm a small-time taxonomic investigator, a shyster. I duck and dive, do my best for a client but sometimes, sometimes the forces I'm up against are just too much for one guy to deal with. I told her so, as tactfully as I could. Her drink arrived, and she looked down at it, stirring it thoughtfully with a cocktail stick.

"So, I guess I'm finished." It was a low whisper, more for her own benefit than mine. "Washed up. Perhaps I should just accept I'm *Fragilaria arcus* from now on?" Already lots of people call me that, some to my face even.

"Don't think like that," I interjected. "Things might not be so bad." This Male character is not such a bad prospect. You could give him a second chance. His DNA approach probably offer you the best chance of proving your monospecificity. He'll put together a molecular tree and there is a good chance that the Euclidean distance between you and the *Fragilaria* clan is sufficient to blow the Mitteleuropean gang's ideas out of the water. Of course, there is a risk attached." I paused, signalled to the waiter for another gimlet, and continued; "but I still think this might be your best shot."

She finished her drink and drew patterns aimlessly with her finger. "Life used to be so easy back when all we had was Hustedt. Then everyone knew who I was and no-one doubted my monospecific status. Now, it all just seems so complicated." Her voice trailed away.

"No use dwelling on the past, *Hannaea*. We've gotta look forward. Even if you ignore this offer, there are other gangs waiting in the shadows. I've heard rumour that the Philadelphia gang are poised to move in." She started, as well she should. The Philadelphia gang, its leader known only by the epithet "Don", was notorious and rumoured to be growing in size and influence. He had brought Russians and Latin Americans into his gang and had gradually overrun the East coast diatom scene. I had probably been too blunt in the way I'd told her, but facts were facts.

"You're probably right, Mr O'Discus. I guess I've got a lot to think over." She pulled her gloves back on. Maybe going to Male's laboratory is the best thing for me. At least I'll get to know the truth, however unpalatable." With that she got up, and walked slowly out of the bar. Everyone's eyes swivelled to follow her. They always did. *Ceratoneis*, *Hannaea* or *Fragilaria arcus*, call her what you will, everyone loved her.

No-one loves a Taxonomic Investigator. We walk the mean streets of taxonomy, making enemies

wherever we go. We earn \$25 a day plus expenses and wonder whether it is all worth it. But watching *Hannaea* glide out of Victor's on that Friday afternoon back in late July, I knew it was. She was the most beautiful diatom in Los Angeles and no-one's nomenclatural racket was going to change that.

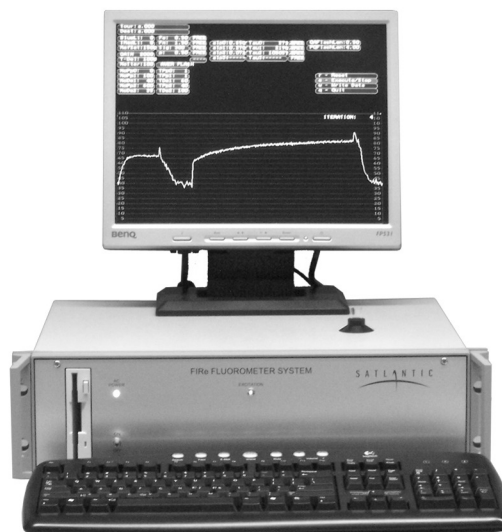
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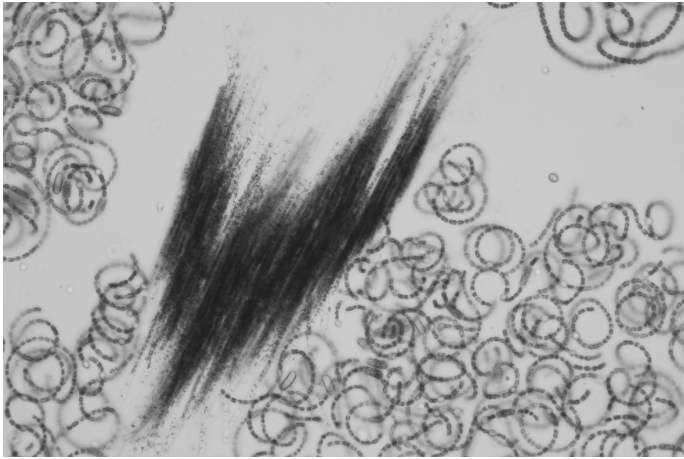


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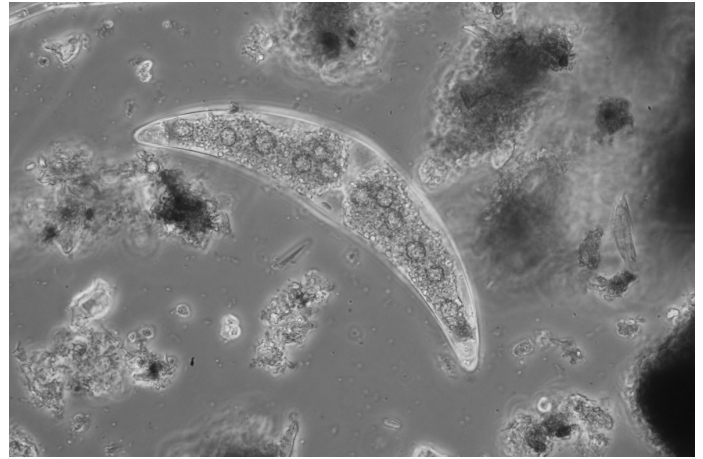
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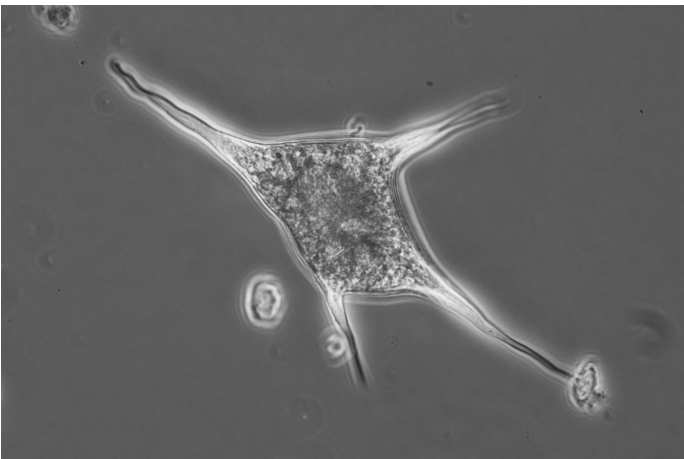




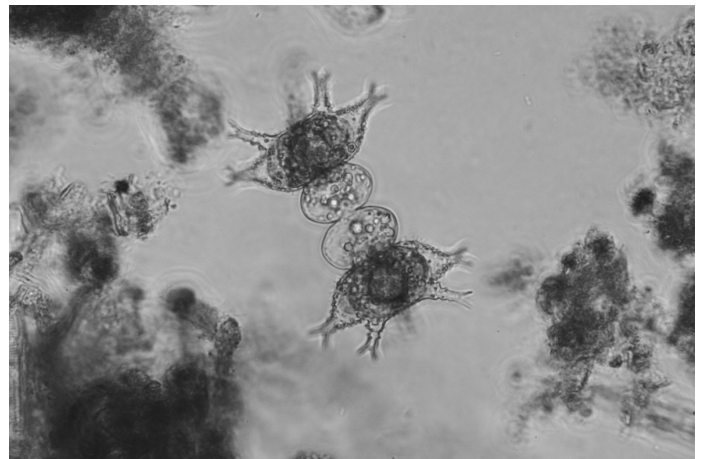
*Anabaena* coils and *Aphanizomenon* flakes.



*Closterium*.



*Ceratium* cyst.



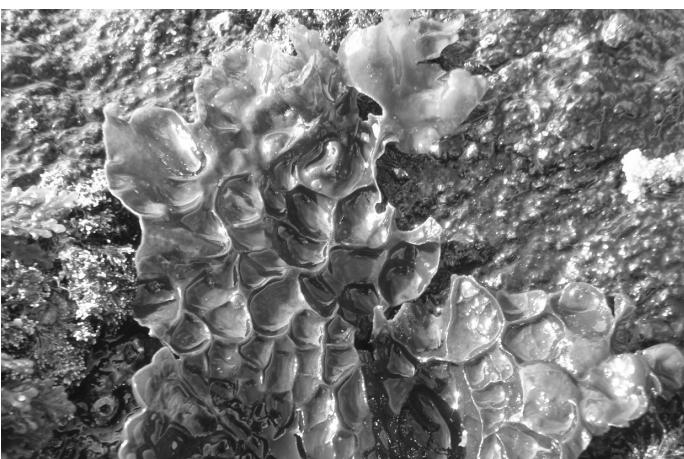
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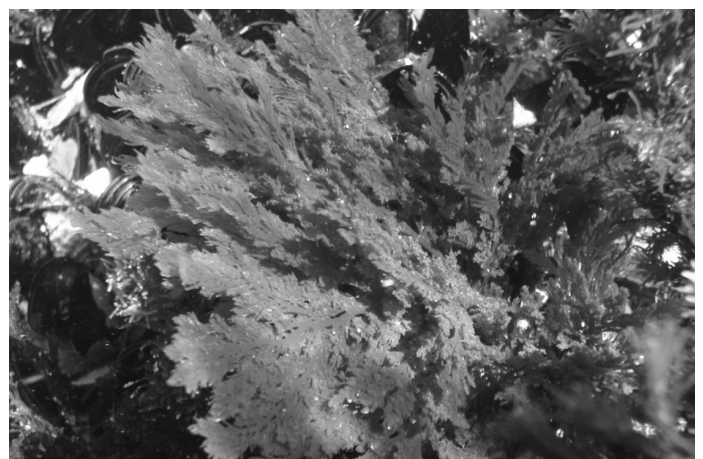
*Chondria coerulescens*. Image: Mário Cunha.



*Gelidium sesquipedale*. Image: Mário Cunha.



*Grateloupia turuturu*. Image: Mário Cunha.



*Plocamium cartilagineum*. Image: Mário Cunha.

# Instructions for Contributors

Copy which is submitted for publication in *The Phycologist* should be concise and informative. Articles should be scientifically sound, as jargon free as possible and written in a readable scientific magazine style. Unless absolutely essential, references should not be included. All types of relevant material will be considered, these include job advertisements, scientific reports, book reviews, news items of topical interest, meeting announcements, grant awards, promotions, appointments, profiles of eminent phycologists and obituaries. If you are interested in submitting material that does not fall within any of these broad categories, or you are unsure of the appropriateness of a potential article, then contact the editor. Suggestions for future articles or a series of articles are welcomed.

Copy should be submitted, preferably as attachments to email or on disc (MS Word for Windows or Rich Text Format). **Illustrations and photos to accompany copy are welcomed and should be supplied in JPEG or TIFF file-format no less than 600 dpi resolution.** The editor reserves the right to edit the material before final publication.

## Submission of Copy and Deadlines

Copy should be submitted to:

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