

The PHYCOLOGIST

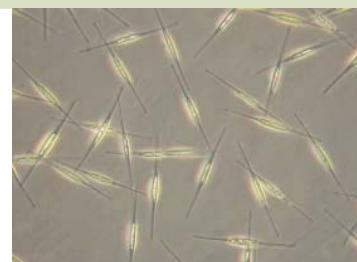


The Newsletter of the British Phycological Society

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Algal Resources



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In This Issue—What's New

One of the areas prioritised in the European Framework 6 funding strategy are Networks of Excellence. Several initiatives that address the need for closer co-ordination of technological and biological resources within the EU have subsequently been funded. This issue of *The Phycologist* therefore presents several articles on algal resources. John Day gives an overview of both the EU-funded Alginet programme and also algal resources in Europe. Christine Campbell and colleagues report from the newly refurbished Culture Collection of Algae and Protozoa at the Scottish Association of Marine Science and Richard Pipe provides a brief history and an update on the marine algal Plymouth Culture Collection at the Marine Biological Association. There are also key projects within the EU that provide algal information resources, a good example is the AlgaeBase project and Mike Guiry gives an insight into the origins and future directions of this database.

Readers who wish to refer to an electronic copy of *The Phycologist* may now obtain a pdf version of the current and archived issues on the British Phycological Society website: <http://www.brphycsoc.org/phycologist.lasso>

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STOP PRESS

It is with great sorrow that the Society notes the deaths of two members. Norman Ingram Hendey died on August 30th, 2004, aged 101 years, at his home in St Agnes, Cornwall. Also Professor Don Boney (former President of the BPS), who died on August 20th 2004. Full obituaries will appear in the next issue of *The Phycologist*.

Cover Image: Clockwise, from top left: *Fucus serratus*, courtesy of Mike Guiry (algaebase.org), *Odontella sinensis* and *Cylindrotheca dosterium* recently isolated off Plymouth and maintained in culture, courtesy of Plymouth Culture Collection; specimens in the Plymouth Algal Culture Collection; laboratory algal culturing, courtesy of John Day.



Important Plant Areas: Update

Juliet Brodie & David John

Following on from the listing of 47 marine sites which have been sent to us for Important Plant Area (IPA) consideration by the British Phycological Society membership, we now have nearly another 40 sites (thanks to Ian Tittley, The Natural History Museum). The addition of these sites now means that there is very good coverage of marine algal sites around Britain. Although only a selection of those sites will be submitted in the first round of IPAs, based on the criteria of this initiative*, we now have the basis of an inventory for sites including those that are maybe species rich, historically important or contain species considered to be rare/threatened.

The number of freshwater sites for consideration has increased from 142 to over 170. In the absence of reliable information on freshwater microalgae, it is difficult to apply the criteria used for designating regional and internationally important IPAs. One of the main criteria used by Nick Stewart to designate 118 putative Important Stonewort Areas (Stewart, N.F. 2004. Important Stonewort Areas of the United Kingdom. Plantlife International, Salisbury, UK) was the number of Red List stoneworts present in threatened sites or areas. We have decided to apply this same criterion to desmids, one of the few algal groups for which there is reasonable body of reliable information on their distribution in Britain. David Williamson is assisting in the task of assessing the status of all UK desmids and preparing a candidate Red List. By comparing our list to European Red Lists for desmids (e.g. Germany, Austria) it should be possible to determine the

international/European importance of our desmid designated UK IPAs. Other criteria used are the same as those adopted for marine algal IPAs.

Progress with the next stage of the UK IPA initiative run by Plantlife is that consultation on the initial draft of UK IPAs will be ready by September. So far, we have submitted all the sites that the BPS membership have sent us and we will add to the list as further information becomes available.

We would like to thank all of you who have sent in sites and details. If you have further sites to add we will be very happy to hear from you. There is no cut off date for adding new sites.

*Criteria for Important Plant Areas

Criterion A

The site holds significant populations of rare algal species which are of European or UK conservation status.

Criterion B

The site has an exceptionally rich and well-recorded algal flora in a UK context.

Criterion C

A site which has an outstanding example of a habitat type of known algal importance.

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A rocky shore in Cornwall.

Algal Resources



Alginet: Microalgae as cell factories for chemical and biochemical products

A European Commission Thematic Network (QLK3-CT-2002-02132)
Quality of Life & Management of Living Resources Programme

Introduction

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Microalgal research worldwide is focused in five main areas, the EU, Israel, USA, Japan and Australia. European research has by far the largest budget, but the results in terms of economic development do not do full justice to the money invested. The development of the Alginet network was stimulated by the many centres of excellence throughout Europe specialising in the various fields of



microalgal research. However, whilst interesting results are often obtained, and much world-class science continues to be published, there have been cases of research being duplicated. Furthermore, the diversity of algal orientated research has inevitably resulted in constraints in, and on occasion poor, communication between workers. For example; much of the microalgal production and product development work in Europe is performed by SMEs, which are not always aware of the cutting-edge research being done elsewhere and do not have access to the latest technologies available. This has undoubtedly harmed competitiveness in the field and one can debate that this has resulted in more progress in algal biotechnology in the USA and Asia than in Europe.

The thematic network was funded because it was felt that the poor level of success in commercialisation of novel algal products could potentially be improved by a body to help co-ordinate European research and to make recommendations for its future direction. The Alginet thematic network proposes to accomplish these aims by bringing together experts from across Europe: academics, industrialists, end-users and SMEs. These experts will discuss various aspects of research and development work in the field. They are surveying the research currently being performed in the field through an in-depth literature and patent search. They will, based on their own experience and the results of this network, select the most promising areas for future development and will produce a report to the European Commission advising on the future direction of European research.

Goals of the project

- . Improve communication between workers in the field of microalgae
- . Focus the direction of European research, to open new markets for microalgal products.
- . To provide a standard reference portal for workers in the field.
- . Enable rapid dissemination of research results, to speed the uptake of new technologies.
- . To attract new interest in the field.
- . To develop an ongoing 'virtual institute' model and lay the groundwork for future RTD projects.

There is a plethora of information available on microalgae, both online and offline. Whilst comprehensive, some of this information is not always very accessible, and it is very dispersed. There are a huge number of culture collections, for example, and finding the strain in which one is interested is often a time-consuming, tedious process. This thematic network will perform a comprehensive survey of European algae collections. This information will be added to an advanced database, either directly or through hyperlinks. This database will be accessible from the network website. The database will create a single portal (or 'one-stop shop') for users and potential users of microalgal

strains.

As with all EU funded projects the work-plan is structured in work packages representing the major areas of activity in the network

WP1 is concerned with network integration and co-ordination, and includes the resources for all network meetings.

WP2 will summarise European algae collections. There are many excellent lists of European algal collections, but no definitive list of all the information available. Members of this work package, led by the curator of the UK Culture Collection of Algae and Protozoa (CCAP), will contact the curators of the various collections and bring together all the information presently available. This will be fed into a specially created on-line database and will provide a 'one-stop shop' for potential users of microalgal technology.

WP3, to determine research and development strategy, is an ongoing part of the project. Its most important activity will be an investigation of the current state of the art, through literature and patent searches. These will allow the partners to assess the current state of the art and to produce a report recommending which areas should be investigated by future research projects (with the assistance of WP4). Further literature and patent searches on an annual basis will maintain the network's knowledge of the latest developments in the field. The second main task of this work package is the preparation of a report detailing the requirements of potential end-users of microalgal technology. It is expected that these two reports will help focus European research into areas of high added value.

WP4 will investigate industrial applications of microalgae. This will study the current uses of microalgae on the global market. From this, a list will be compiled containing useful products that can be obtained from microalgae. This list will be added to the web site as a service to interested potential end-users. The results obtained from this work package will be fed into other work packages to assist with their reports and recommendations. It is closely connected with WP5, which investigates current barriers to the use of microalgal biotechnology and proposes solutions.

In order for these results to achieve maximum impact, an excellent dissemination strategy for the network's results is needed, which is the responsibility of WP6. This work package handles all the dissemination work for the project. Its activities will be accomplished through an enhanced web site and advanced on-line database, but additionally through direct contact with industry at conferences, symposia and similar meetings. The network also promotes technology transfer between members, particularly for SMEs. WP6 will also be responsible for the solidification of the network and for the development of a possible virtual institute for microalgal technology.

For further details visit the Alginet website : www.algi-net.org or contact John Day or Christine Campbell at ccap@sams.ac.uk

Algal culture collections in Europe

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European microbial culture collections have provided a service to the scientific community for over a century, with the first 'service collection' established by Dr Franticek Král in Prague towards the end of the nineteenth century. In the 1920s Professor E.G. Pringsheim developed the first major protistan culture collection in Prague publishing its first catalogue in 1928 (Pringsheim, 1928). This collection has subsequently become the 'parent', or even 'grandparent', of most of the largest algal culture collections worldwide (Day et al., 2004).

As with other collections of biological materials, algal culture collections have two key functions: they provide consistency and quality, traceable source material and information. They are, *de facto*, sources of biological standards and without these standards comparative taxonomic, physiological, ecotoxicological and *ex situ* ecological studies are impossible or, at best, problematic. The value of collections to the user community is widely recognized, not least in that they provide cultures that are often difficult or virtually impossible to re-isolate from their natural habitats, even when the original source is known and accessible. They provide a store of characterized diversity for research/exploitation, or potentially, particularly in the case of macroalgae, reintroduction to their original habitats. The holdings of algal collections are extremely diverse and it is the aim of the service collections to make available and conserve *ex situ* as much of the great morphological and genetic biodiversity of microalgae as possible. For phylogenetic and taxonomic studies authentic strains, i.e. cultures derived from the material used for the original description and naming of the species, are particularly useful - these and the vast literature published on the algal culture collections' holdings make them irreplaceable and unique international resources.

In Europe today there are debatably more protistan collections than at any time over the past century. The first algal culture collection meeting to be held in Europe 'Culture Collections of Algae: Increasing Accessibility and Exploring Algal Biodiversity', held at the Sammlung von Algenkulturen (SAG) at the University of Göttingen, Germany, September 2-6 2002 highlighted the valuable contributions of culture collections to science (Surek, 2002). This meeting was attended by representatives from 19 European collections, from 14 European countries as well as representatives from algal collections in North America and Asia. It also highlighted the diversity of European collections and the wide range of skills associated with these collections. At this meeting there was a clear

consensus that there was a need to improve accessibility to biological resources at a European level and to increase cross-collection collaboration. At present, as a component of the AlgiNet project, a survey of collections and their holdings is ongoing. To date, this has identified the existence of 9 macro-algal culture collections and 90 micro-algal culture collections (Table 1). These collections vary in size from small personal academic research collections, biotechnological collections to well established service collections including: the Pasteur Culture Collection of Cyanobacteria in Paris (France, PCC), Algobank in Caen (France), Culture Collection at the Botanical Institute in Trebon (CCALA Czech Republic), NIVA Collection in Norway (Edwardsen et al., 2004), ACOI Coimbra Collection of Algae in Portugal (Santos & Santos, 2004), SAG and CCAP. In total the holdings of these collections are in excess of 10,000 algal strains and undoubtedly represent the most comprehensive range of algal cultures in the world. It is planned to improve access to the holdings of these collections via the AlgiNet website and in due course the findings will be made available on-line at <http://www.algi-net.org/>. One aspect of the project is to highlight how the roles of these collections, particularly the larger service collections, has expanded past the traditional curatorial role and include services such as patent deposit facilities and the supply of cultures for quality control. Indeed, service culture collections have evolved into Biological Resource Centres (BRCs) thereby responding to revolutionary developments in areas such as molecular biology and bioinformatics. The current role of BRCs is to provide the scientific world with access to properly maintained culturable material in the case of algal collections with cyanobacterial and protistan cultures and their associated data. As a consequence of these developments BRCs form an invaluable part of the infrastructure that underpins the conservation of biodiversity, developments in microbial technology (including biotechnology), and ecological structures linked to the sustainability of life support systems.

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Table 1. Distribution of European algal culture collections.

Country	Macro	Micro	Country	Macro	Micro
Austria		2	Netherlands	1	1
Belgium		4	Norway	1	2
Bulgaria		1	Portugal	1	5
Czech Republic		5	Romania		1
Denmark		1	Russia		7
Finland		2	Slovakia		2
France	1	12	Spain	1	5
Germany	2	11	Sweden		2
Hungary		2	Greece		3
Ireland	1	1	Ukraine		2
Israel		2	UK	2	10
Italy		5			
Lithuania		1			
Luxembourg		1			



culturecollection
of algae and protozoa

The Culture Collection of Algae and Protozoa – Reunited at Dunstaffnage Marine Laboratory, Scotland

Christine N. Campbell, John G. Day and Frithjof C. Küpper

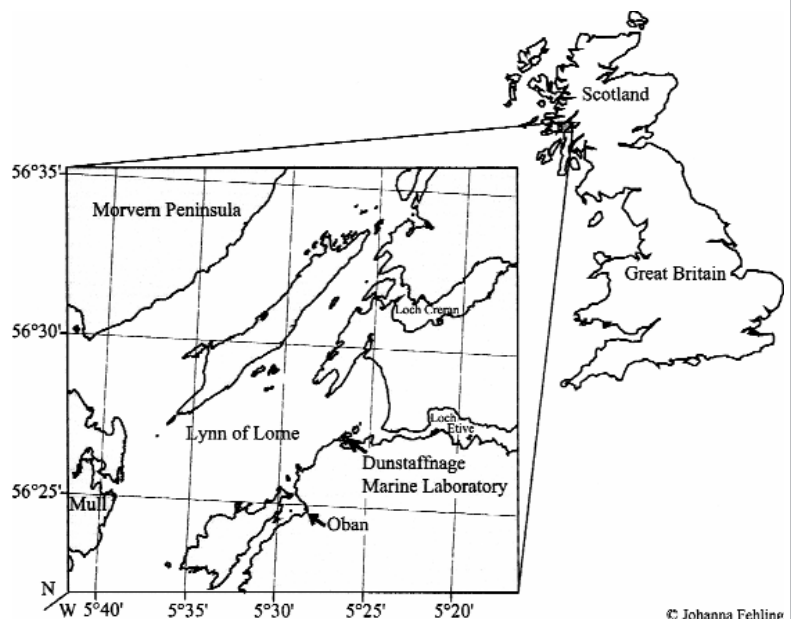
In February this year the freshwater and protozoan part of the Culture Collection of Algae and Protozoa moved from Windermere to be reunited with the marine section at the Scottish Association for Marine Science (SAMS) laboratory at Dunstaffnage near Oban in Argyll on the west coast of Scotland. CCAP now occupies a spacious custom-designed laboratory and office suite in the European Centre for Marine Biotechnology wing of the SAMS site.

Background

The CCAP had been relocated from Cambridge in 1986 to 'sites where relevant research on algae and protozoa was being carried out and the collection could be integrated into the scientific activities of larger laboratories'. Approximately 2/3 of the

collection had been relocated to the FBA (CEH Windermere) and 1/3 to SMBA (SAMS). This arrangement was extremely successful and benefited the CCAP, its 'host' organisations and the UK plc. Mid 2002 NERC's Centre for

Ecology and Hydrology planned the relocation of the Windermere laboratory. For CCAP-F, CEH Dorset was considered and rejected on scientific grounds. Plans were then developed to relocate to CEH Lancaster.



Map to show location of CCAP at Dunstaffnage.

© Johanna Fehling



New laboratory space at SAMS.

Meanwhile the construction of a new SAMS laboratory was underway at Dunstaffnage and in Jan/Feb 2003 the alternative option of recombining both sections of CCAP at SAMS was explored. It became clear on a scientific basis and long-term value for money that relocation to SAMS was a better option. During 2003, the CCAP curators, with SAMS senior management and the architect, planned an integrated laboratory and office suite for the Collection within the SAMS European Centre for Marine Biotechnology facility.

In January 2004 key staff were 'transferred' from CEH to SAMS and recruitment of replacement support staff was carried out in February-March 2004. The relocation of CCAP-F was completed at the beginning of March 2004, having already transferred the 'back-up' algal collection, the main collection of the CCAP-F live cultures and the cryopreserved collection to the SAMS new facility. In July both sections of CCAP migrated to the new purpose built CCAP facility. The united collection has a staff of 8 (including 3 part-time staff) plus Frithjof Küpper, who joined SAMS in November 2003 and will lead CCAP within the Marine Algal Research Group.

Facilities

Within the Collection laboratories is a culturing area with laminar flow cabinets and a range of microscopes, a

Class II cabinet for working with pathogens and a cryopreservation facility with controlled rate cooler and a cryogenic microscope. There are 4 walk-in controlled temperate rooms and 6 individual illuminated incubators which enable culturing at a wide range of temperatures. CCAP also has its own autoclaves and a well-equipped wash-up lab. As part of the CCAP facility there are large liquid nitrogen storage vessels. Elsewhere in the SAMS lab, CCAP has access to a molecular genetics facility, a microscope room with a high specification image analysis capability, the SAMS analytical laboratory, an electron microscope suite with SEM and TEM machines, the SAMS library and the research vessels, the *Calanus* and the *Seol Mara*.

Future plans

CCAP is now in excellent condition to face the future. It is envisaged that the recombined CCAP will continue to be at the forefront of protistan collection development. It is a major Biological Research Centre and the new fit-for-purpose facilities will make it a truly world-class facility. The holdings currently stand at around 2000 strains and accession work is now focussed on widening the diversity in terms of taxonomy and the environmental habitats the cultures are sourced from, in particular with a view to finding cultures with biotechnological applications.

For customers wishing to order cultures the process is now much simplified with all processing now being carried out at the CCAP admin desk at Dunstaffnage (ccap@sams.ac.uk) and invoicing being carried out via SAMS Research Services Ltd.

National and international collaborations, including the on-going COBRA (www.cobra.ac.uk) and Alginet (<http://www.algi-net.org/>) projects, will be further enhanced and there are many other projects planned that will be developed over the next few years including:

- . Technology transfer of the cryopreservation expertise of CCAP-F to initiate a program of cryopreservation of marine algae

- . Studies of low temperature tolerance and stress in polar and non-polar microalgae: applications in fundamental and applied environmental research

- . The collection has a new logo and will soon launch an updated website (www.ccap.ac.uk) with plans to include extended bioinformatics including algal images in addition to the updated strain list.

- . Further development of CCAP's molecular services. As part of a project funded by the NERC Marine and Freshwater Microbial Biodiversity programme, CCAP will carry out phylogenetic studies on all its new marine accessions.

It is also envisaged that CCAP at SAMS will become the focus of future scientific meetings. A COBRA workshop was held at SAMS this autumn and in addition a CCAP launch event and a future Alginet workshop on algae in aquaculture are under development. CCAP continues to take part in the UK National Culture Collection (UKNCC) organisation.

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Plymouth Algal Culture Collection

Historical Background

The Marine Biological Association (MBA) was formally constituted on 31 March 1884, with T.H. Huxley as the first President. The Plymouth Laboratory was opened in June 1888. The early years were somewhat unsettled and saw several Directors come and go, however, in 1894 Dr E.J. Allen FRS was appointed as Director and he held the position for 41 years until his retirement in 1936. His early research involved rearing marine larvae, and for this he decided that the larvae should be kept in sterile seawater and fed with pure cultures of planktonic diatoms. In March 1905 Dr Allen commenced his experiments to generate pure algal cultures and in the summer of 1907 Mr E.W. Nelson became associated with the investigation, leading to a joint publication (1) on the artificial culture of marine plankton in 1910. The culture methods were based on the observations of several earlier investigators including, Lockwood (2), Houghton Gill (3), and Miquel (4). Of particular interest is a statement in the paper:

"In the case of the diatom we have very largely used for feeding larvae, etc., namely *Nitzschia closterium*, forma *minutissima*, a great number of cultures have been made, all originating from the single drop from which the first persistent culture was obtained. The total amount of growth in all the various cultures has been enormous, and the number of generations must be quite inconceivable. No diminution in size has, however, been appreciable, and no sign of any method of re-establishment of size has been seen, although these cultures have been under constant observation for over two years. This seems to prove that the theory of gradual decrease in size with successive generations cannot be generally applied"

Nearly 100 years later this strain (PLY#100, now *Phaeodactylum tricornutum*) is still in the Collection and is still used as a food source for larval and invertebrate culture.

In 1915 Marie Lebour was appointed as a temporary Naturalist for the period of the First World War, after which she held a permanent appointment until her retirement in 1946. Her early studies were on micro-plankton which she obtained by centrifugation of seawater samples. She wrote two classic volumes on phytoplankton, *The Dinoflagellates of Northern Seas* and *The Planktonic Diatoms of Northern Seas*.

The main development of the Plymouth Algal Culture Collection took place under the guidance of Dr Mary Parke (later FRS), who was transferred to the Plymouth Laboratory in 1941 to work on alginic acid production from kelps and brown rockweeds. She was appointed to the staff as Botanist in April 1947. Dr Parke had already established a number of marine flagellate cultures as part of her work

on the feeding of oyster larvae at the Port Erin Marine Biological Station and she was able to continue with this work after the War. The research resulted in the publication of a number of seminal papers on flagellate systematics, many in collaboration with Professor Irene Manton (later FRS) of the University of Leeds who brought her skills in electron microscopy to the partnership. The 14 co-authored papers of Parke and Manton gave details of new structures and organelles to be found in many of the organisms from the Culture Collection, together with information on their functions within the cell. This led to a revolution in algal systematics and laid the foundations for new ideas on cell structure and function in general and also emphasized the need for readily available material in culture for comparative studies of all kinds. In 1958 Dr Gerald Boalch was appointed as the International Paints Research Fellow and joined the staff on a permanent basis in 1961. Dr Boalch worked closely with Dr Parke and made a substantial contribution to studies of the life history and taxonomy of algae. Although Dr Boalch retired officially in 1993, he still comes to the Laboratory twice a week and continues to contribute to the algal research of the MBA and helps the Collection through advice and identification of new isolates.



Part of the Plymouth Algal Culture Collection of the MBA.

In 1962 an extension to the Plymouth Laboratory was completed and this incorporated botanical laboratories and a temperature-controlled culture room for the Collection. When first used many of the cultures were lost due to fumes from a cupboard in the culture room which had been constructed with a formaldehyde-based adhesive used for veneering. Its replacement with a solid wood cupboard solved the problem and there was no further loss of cultures.

Dr John Green was appointed in 1968 to work with the Culture Collection and he continued the productive collaboration with Professor Manton at Leeds University. Following Dr Parke's retirement in 1973, responsibility for the Culture Collection was assumed by Dr Green. He continued the work on fine structure, with a particular emphasis on the Prymnesiophyceae until his retirement in 1998.

Plymouth clones have been distributed to all the major international algal culture collections; including 46 cultures (37 of which survived the journey) sent in 1962 to the American collection of Type Cultures of algae at Indiana University. The Plymouth Collection, together with the Butcher and Pringsheim Collections, also formed the basis of the marine section of the Culture Collection of Algae and Protozoa when it was originally established in Cambridge before transferring to the Dunstaffnage Marine Laboratory near Oban.

Current holdings and role

The main Plymouth Collection consists of some 250 strains from 70 genera of marine phytoplankton. Many Plymouth strains are not held by any other collection in the world, and of particular importance is the additional collection of some 200 *Emiliania huxleyi* clones. The Collection operates as a research facility, offering specialist help in isolation, culture and maintenance of marine microalgae, not only for Plymouth researchers but also for the wider international marine scientific community. The Collection distributes approximately 300 to 400 culture strains per year: ~50% to Plymouth researchers and the other 50% to national and international academic institutes and commercial users.

Staff from the Collection have isolated and cultured an additional 25 new diatom and dinoflagellate strains from the Plymouth area over the last 2 years, in order to accommodate the specific interests of local researchers at both the MBA and Plymouth Marine Laboratory. The Plymouth Collection maintains close links with the Culture Collection of Algae and Protozoa (CCAP) based in Dunstaffnage and exchanges backup strains as necessary.

As well as underpinning the core research programme of the MBA, the Collection is a specialist facility for the European scientific community as it is an integral part of the EU MARINE GENOMICS Network of Excellence and also the EU MARPLAN (European integration of research expertise in the study of marine microplankton diversity) programme. The Collection will also play a key role in providing diatom cultures for the recently funded EU STREP DIATOMICS programme. The Collection

plays a significant role in the teaching and outreach activities of the MBA, including provision of live cultures for advanced research workshops, the joint MBA University of Plymouth MRes degree in Marine Biology and hosting many summer research students.

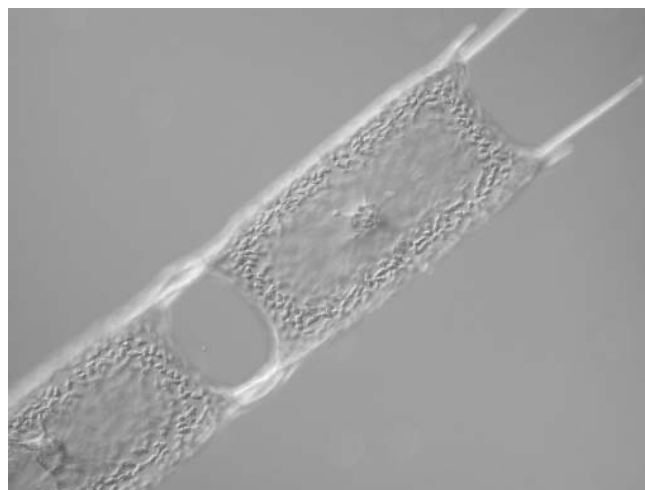
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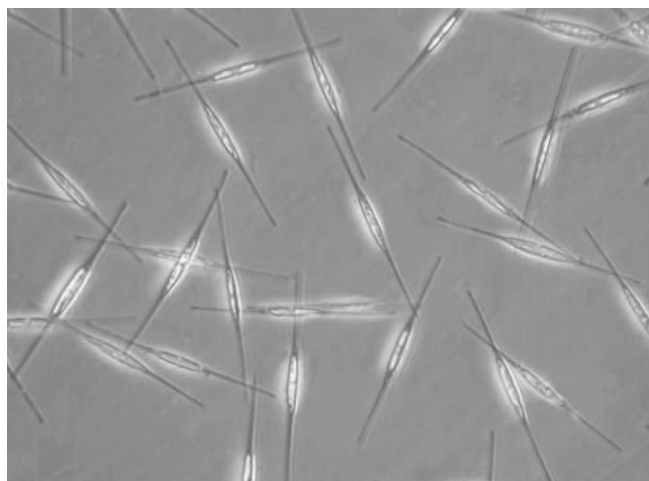
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For further information and ordering strains please see the website:

www.mba.ac.uk/culture-collection



Odontella sinensis isolated off Plymouth.



Cylindrotheca closterium recently isolated off Plymouth and maintained in culture.



AlgaeBase (www.algaebase.org): listing the world's algae

Michael D. Guiry

Martin Ryan Institute, NUI, Galway, Ireland

AlgaeBase is another fine example of obsessive-compulsive behaviour. Not being content with a dark history of stamp-collecting (given up at 14 for outdoor pursuits), reprint hoarding, herbarium-specimen accumulation, I started in 1996 a small, web-enabled database of seaweeds. Initially, this included only those reported from the area popularly known as the British Isles but extended to north-western Europe for 'The Species Directory of the Marine Fauna and Flora of the British Isles and Surrounding Seas' (Guiry, 1997). This, in turn, became further extended to the north-eastern Atlantic and Mediterranean, for the 'European Register of Marine Species' (Guiry, 2001) an EU-funded project led by Dr Mark Costello, then of Trinity College Dublin. AlgaeBase also formed the basis for the 'Check-list and Atlas of the Seaweeds of Britain and Ireland' (Hardy & Guiry, 2003).

Rather like a Triffid (<http://www.triffid.org/whatis.html>), AlgaeBase grew and grew (Nic Dhonncha & Guiry, 2002), and because of overlaps between marine, terrestrial and freshwater habitats and organisms, freshwater and terrestrial algae were added about two years ago. In order to separate the database from its original location, the seaweed site (<http://www.seaweed.ie>), the name AlgaeBase was adopted and registered at this time. Two domains, algaebase.org and algaebase.com, were purchased, but after a year the latter address, due to an administrative error, was stolen by a nasty little company specialising in such things, and now irritatingly leads to a very silly search site.

AlgaeBase now consists of a species module with over 55,000 names of species, subspecies, varieties and forms, with information on types and distribution (in 13 geographical areas and over 200 countries). A genus module includes the names of nearly 5,000 current generic names and 578 current family names, together with information on classification, type species, original sources and references. Thirteen phyla, 43 classes and 182 orders are currently included. A bibliography module has about 35,000 references on algae including all the papers published in the major phycological journals. Other modules include uses, common names, etymology, images, and a number of unimplemented databases. The image modules includes

algae from all over the world in a special optimised format ideal for use in PowerPoint presentations: these only need to be dragged from the site to the presentation page. Most are 600-800 pixels across and are only 50-120 Kb. Some really nice pictures have been provided from places all over the world by Colin Bates, John Huisman, David John, Chris Lane, Diane Littler, Fabio Rindi, Yukihiro Serisawa, Robert Wilkes, and yours truly. Again, it is the seaweeds that are best represented.

At present, AlgaeBase is stored in files in Filemaker (<http://www.filemakerpro.com>) and uses Lasso (<http://www.blueworld.com>) as 'middleware'. Currently, we are about to implement a MySQL version of the database, which is completely independent of Filemaker and is almost 100 times faster. We will continue to use Lasso as middleware mainly because its programming language is simple enough to allow complete fools like me to make changes.

We hope-when the new version becomes available-to recruit taxonomic experts from around the world who would 'tend' particular groups of algae. Such access will be possible via common browsers such as Internet Explorer and Netscape (and on Macs and PCs) but will be restricted by username and password. I should particularly like to hear from people interested in providing this service (mikeguiry@guiry.org). Please bear in mind that AlgaeBase is *pro bono* work and the benefits are just as non-existent as publishing on paper. When I published my first paper, I showed it with great pride to my father, a farmer-businessman who left school at 13, who asked how much I had been paid, and was genuinely horrified when I told him the awful truth.

Sets of data from AlgaeBase are used by Species 2000 and the Catalogue of life (<http://www.species2000.org>), GenBank (<http://www.ncbi.nlm.nih.gov/Taxonomy/taxonomyhome.html>), the Global Biodiversity Information Facility (<http://www.gbif.org>), the Census of Australian Aquatic Biodiversity (<http://www.marine.csiro.au/caab>), the European Register of Marine Species (<http://www.v/12.be/vmdccdata/erms>), and the Seaweed Africa project funded by the European Union via INCO-DEV (<http://www.seaweedafrica.org>).

So, after all that, what is AlgaeBase? Well, it is essentially a free source of taxonomic and distributional infor-

mation on algae. It does NOT pretend to be a nomenclator-a definitive source of nomenclatural information-this function is most ably performed by Index Nominum Algarum (<http://ucjeps.berkeley.edu/INA.html>) and the Index Nominum Genericorum (Plantarum) (<http://ravenel.si.edu/botany/ing.htm>), both of which include Paul Silva's nomenclatural storehouse painstakingly accumulated over many, many years and definitive in its authority. Other projects on nomenclatural and taxonomy of algae have been published, or are planned to publish information on algae on the web, including Micro*scope (<http://microscope.mbl.edu>), and AlgaTerra (<http://www.algaterra.org>).

So, how complete is AlgaeBase? Well, the seaweed information, predictably, is the most complete, somewhere about 95%. The Rhodophyta, again predictably, is the most documented phylum. Overall, the most incomplete coverage is for the diatoms and microscopic green algae. Presently, about 35,000 species names are regarded as current but the final outcome is likely to be about 50,000 species of algae, but this figure presumes that the diatoms will only be about 10,000 species, which is currently assumed to be an underestimate. Compare this with 1.6 million organisms described to data, most of which appear to belong to the Insecta.

Of course, dear reader, I hear you darkly muttering, what are algae anyhow? The only answer to this should be: "If they're in AlgaeBase, they're algae."

Finally, despite the fact that AlgaeBase is an electronic source, relying on ephemeral arrangements and transportation of subatomic particles to provide instant gratification of your desire for immediacy, it remains based on paper, a similar, if less ephemeral arrangement of particles. Every bit and byte in AlgaeBase has been entered from a piece of paper, and it is your business, dear surfer, to verify this information before you accept it.

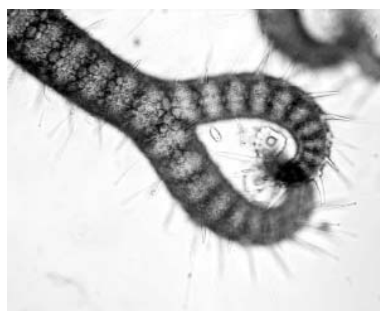
Acknowledgements. Some truly wonderful people have been involved in this project, prime amongst them has been Eilís Nic Dhonncha, whose blend of enthusiasm and decisiveness has sustained me over the last 8 years. Olivia Fitzgerald, Wendy Guiry, Sandy Lawson, Elizabeth Moran, Fabio Rindi, Andy Taylor, and Robert Wilkes all bore (or bear) the burden of data entry with fortitude, but with the certain knowledge that breaking rocks might be more satisfying. My most grateful thanks to all of them on behalf of myself and you, the erstwhile user. I am also very grateful to all the people who gave us data, wrote in with suggestions, sent in literature, and many other things too numerous to mention. AlgaeBase has been fortunate to date to receive support from: NUI, Galway and the Martin Ryan Institute; the Priority Research in Third Level Institutions (PRTL) scheme run by the Higher Education Authority, Department of Science and Education, Dublin for the Environmental Change Institute (1999-2002) and the Marine Science Research programme (2002-2005); and the European Union via INCO-DEV (ICA4-CT-2001-10030) for the SeaweedAfrica project.

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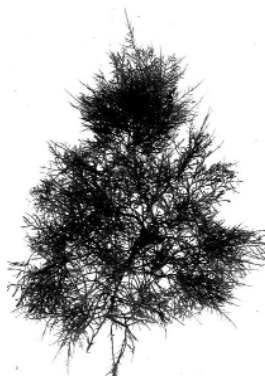
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Antithamnion densum (Suhr) M.A. Howe



Ceramium echionotum J. Agardh



Gelidium pulchellum (Turner) Kützing

Pictures: courtesy of M.D. Guiry



Field Course and Meeting reports

Collecting & Identifying Seaweeds 19-21 April 2004

This 3-day course was the first field meeting of the British Phycological Society for 30 years and a new joint venture between the BPS and MBA. The course was led and organised by Dr Christine Maggs (Queen's University of Belfast) and Francis Bunker (a consultant running MarineSeen, based in west Wales). Valuable local knowledge was supplied by Dr Gerald Boalch (now officially retired from the MBA) and Dr Francisco (Paco) Arenas.

The course was held in the new Resource Centre in the MBA. The excellent facilities included an interconnecting lecture room and laboratory space with ample computing facilities. A total of 25 participants attended including undergraduates, postgraduates, professionals and interested amateurs who came from all corners of the British Isles (and there was even one 'student' from the USA). Martin Wilkinson, a veteran of BPS field meetings, brought four of his students from Heriot-Watt University.

On the first day, Francis gave a presentation on habitats where seaweeds can be found and Chris spoke about seaweed taxonomy. Gerald Boalch led the first field trip to Church Rocks, Wembury (by arrangement of the Marine Conservation Officer). Students formed teams with the aim of sampling as many different seaweeds as possible from different zones of the shore (in a mildly competitive way!). The sun shone and the local ice cream was good. Back at the MBA, we sorted through masses of seaweeds, and tried to identify them using various keys and the Seaweeds of the British Isles series including Brodie and Irvine's new bangiophyte volume. The suite of computers with internet access meant that participants could explore the new British Isles Seaweed Images web site www.weedseen.co.uk. This was created by Francis Bunker and James Perrins with input from Chris Maggs and some funding from the BPS. This enabled course participants to check their identifications, get information about each species, and give feedback to Francis.

On the second day, Gerald Boalch took course members to see the valuable MBA herbarium as well as his collection of classic and valuable seaweed texts. The herbarium includes many historically important specimens such as those of Alison Westbrook (Mrs D.P. Wilson). Francis presented his 'tips for seaweed identifications', and then we went out to a nearby sheltered shore, Mount Batten, to collect a different group of seaweeds.

Demonstrations of seaweeds of particular interest, and named examples of typical species, were set out, and added to by all participants. The teams all added their identifications to a copy of the 1952 Flora of Devon algal checklist, supplied by Dr Boalch. A total of over 100 species were identified by the class and verified. The 'winning' team was Heriot-Watt, with the most identifica-



Polysiphonia simulans. Courtesy of Christine Maggs.

tions. Key specimens were donated to the MBA herbarium. An interesting find was provided by Keith Hiscock (*MarLIN*), who had made a subtidal collection including the (probable) alien *Cryptonemia hibernica* which was recently discovered at Plymouth. Chris thought she had found *Polysiphonia ceramiaeformis*, an extreme rarity, but it turned out to be *P. simulans* instead. The pain this caused was shortly eased because Francis Bunker and Lin Baldock kindly went to Chapman's Pool, Dorset, the only known site for this species in the British Isles, and collected some exactly where it was last found over 10 years ago.

Practical aspects of the course were: how to make a herbarium; how to set up cultures; how to dry seaweed for DNA extraction; and making microscope slide preparations. Numerous sets of pressed specimens were taken home by students. Feedback was good - students seem to feel that the course was about the right length, with a good mix of different activities.

The course leaders would like to thank the staff of the MBA including Drs Gerald Boalch and Paco Arenas, and Keith Hiscock (*MarLIN*). We are grateful to Dr Richard Pipe for seeing to the laboratory needs of the course, Alexandra Angevi for administration assistance, Nick Bloomer for IT support and last but not least the catering staff. Due to both the success of the event and popular demand, it is hoped to repeat the course in April 2005.

Christine Maggs c.maggs@qub.ac.uk



Francis Bunker with students on the shore at Wembury.

Introductory Algal Identification Course (July 2004) - A Wet Algae Week in Durham!

The picturesque if unseasonably wet city of Durham played host to the Introductory Algal Identification course this year led by Professor B.A. Whitton and Dr D.M. John. The course catered for those with a limited knowledge of freshwater algae and introduced the topic with expertise and unsurpassed enthusiasm.

Those in attendance hailed from a wide variety of backgrounds, ranging from the Environment Agency and environmental consultancies to postgraduate researchers such as myself. The fifteen participants travelled from across Britain, the Republic of Ireland and as far as Turkey for the week-long course. Which, though intense, was well worth the trip!

To commence the week, Professor Whitton focused on the *Cyanophyta*, instilling interest in the blue-greens response to phosphorous stress and later the subject of algal blooms. Dr John gave several interesting lectures on the *Chlorophyta* and introduced the other major groups of sub-aerial algae. Dr Gordon Beakes advised on how to make the most of a microscope for algal identification. Midweek, Dr Martin Kelly of Bowburn consultancy spent a day illuminating the ins and outs of the Diatom key and



Participants enjoying the course dinner.

the applications of the Trophic Diatom Index.

During practical sessions an updated UK Freshwater Algae Database (NHM), soon to be available online, was introduced to the group by Peter York. Dr Alan Donaldson (consultancy) introduced the latest technological advances in algal identification with the newest versions of LUCID CD-ROM interactive keys for Blue-Green and Green Algae. A field visit on the Tuesday to Cassop Vale National Nature Reserve giving an excellent introduction to sampling and collection techniques.

The week ended with a celebratory formal dinner on Thursday evening including a surprise birthday celebration for one of the course's participants. Later, a slide show quiz on Friday afternoon gave everyone an opportunity to test their new found identification skills. Finally, an optional field visit on Friday afternoon for the enthusiastic followed the River Wear from Upper Weardale to Durham and ended the week on a high note.

This introductory course opened a door to phycology for the uninitiated with inspirational fervour. Even coffee breaks were opportunities for fascinating discussions. The keenness and gusto of the course leaders was passed on to the participants making the week a thoroughly worthwhile and rewarding experience.

My sincere thanks to Professor Whitton and Dr John for a memorable week. I am confident that the time in Durham has been an invaluable aid to my own studies of macroinvertebrate responses to riverine biofilm composition. I would also like to express my gratitude to the British Phycological Society for the financial support I received which enabled me to attend the course.

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Societas Internationalis Limnologiae (SIL) XXIX Congress, Lahti, Finland, 8-14 August 2004

The generous contribution of the BPS to the very high registration fees enabled me to participate at this large, international meeting in Lahti, Finland. Nearly 1000 limnologists from 70 different countries met in the cultural centre of the city to present over 400 posters and about 450 talks in up to 11 parallel sessions. Through the excellent work of the organising committee under Timo Kairesalo everything ran very smoothly and the time allocated to presentations and time for breaks and networking was balanced very well. The registration in the impressive City Theatre started on Sunday morning and then there was time to study the extensive conference programme and arrange a personal programme, meet and catch up with new and old friends and colleagues and enjoy some ice cream in wonderful sunny weather. In the evening the

official opening ceremony took place in Sibilius Hall next to Lake Vesijärvi, which was followed by the City Reception where we were served traditional Finnish food and plenty to drink.

Monday morning started with the first general assembly, which included the presidential address by Gene E. Likens who spoke about 'Providing Limnological Leadership in Tomorrow's World' where he raised concerns about the decline in membership in some of the traditionally strong countries such as UK, while yet limnology has an important role in this time where we are facing major challenges in providing water for a rapidly growing population. He also mentioned the newly introduced 'future committee', which, under the leadership of Professor Brian Moss, will hopefully provide new ideas for the future role of SIL in freshwater science. It was followed by the Baldi Lecture presented by Professor Wolfgang Junk on 'Flood pulsing and our understanding of links between terrestrial, aquatic and wetland systems'



View of Lahti, Finland.

highlighting the Flood Pulse Concept. Oral and poster sessions filled the rest of the day. The topics covered were wide ranging from single water bodies to the catchment scale, from molecular biology to communities and food-webs, from the study of abiotic factors to biological processes. Amongst the presentation of research results, of which several addressed the topic limnology and climate change, there were also talks on the progress made in the implementation of the Water Framework Directive in various European countries and critical accounts e.g. by Peter Laevitt on seeing 'the variability of ecosystems' as a property.

After the presentation of my poster 'Organic inclusions in lacustrine diatom frustules as a host for carbon and nitrogen isotopes?', which generated lots of interest, the 'informal reception' in the SIL tent on Tuesday night was a great social event with plenty of nice food. It was difficult to decide which plenary lecture to visit on Tuesday and Thursday morning as they were run in parallel session. On Tuesday I attended the Kilham lecture presented by Dag O. Hessen on 'Aquatic Food Webs; stoichiometric regulation of carbon flux and population dynamic', which progressed from the cellular to the global level and stressed that many lakes are net heterotrophic. This was followed by the plenary lecture of Z. Maciej Gliwicz who spoke about 'Food web interactions: Why are they reluctant to be manipulated?'. The parallel plenary lectures were by Kaarina Sivonen et al. covering 'Development of molecular tools for toxic cyanobacteria' and by Hans Paerl et al. on 'The structure and function of aquatic microbial communities: Is what you see what you get?'.
After two intensive days, the mid-congress excursions provided a welcome break and an opportunity to visit one of the many limnologically interesting places including the Biological Stations at Lammi and the Zoological Station at Tvärminne (see report by Anne Powell and Roger Sweeting in FBA newsletter from Sept. 2004), many lakes and waterways around Lahti or one of the interesting towns and cities of southern Finland. Thursday started again with parallel plenary sessions given by Erik Jeppesen on 'Lake responses to reduced nutrient loading' stressing the importance of diffuse pollution in times where point sources have often been eliminated. This was followed by Roger Jones on 'Limnology of humic waters', who concluded that 'All lakes are humic, but some are more humic than others'. During the parallel session Ellen van Donk was speaking on 'Planktonic interactions: Developments and perspectives' followed by Jack Stanford on 'Floodplain biocomplexity: Dynamic controls on emergent properties of river ecosystems'. More oral and poster sessions and workshops followed until Saturday lunchtime when the congress finished with the second general assembly.

It was a most stimulating and interesting week where I learned a lot about current research projects in many theoretical and applied aspects of limnology and a good opportunity for networking. Thank you very much for the support BPS.

Dr Lydia King
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l.king@lancaster.ac.uk

The 53rd Annual Meeting of the BPS – January 5th–7th 2004

The 53rd Annual Meeting of the BPS will be hosted by Drs Barry Leadbeater and Maureen Callow at Birmingham University in 2005 (<http://www.about.bham.ac.uk>). The meeting will begin at lunchtime on Wednesday January 5th and end at 4.30pm on Friday January 7th 2005. Two special topics are included in the programme: 'Pole to Pole Phycology' (organisers Johanna Laybourn-Parry and John Anderson) and 'Biomonitoring and Conservation' (organiser Jan Krokowski) (see below).

Registration

Registration forms will be on this website (<http://www.brphycsoc.org/>) from October and should be submitted by December 1st. A hard copy of the registration form may also be obtained from Barry Leadbeater:

Dr Barry Leadbeater
BPS Conference
Department of Biosciences
The University of Birmingham
Birmingham B15 2TT – UK

Preliminary Scientific Programme:

Wednesday 5th January

11.00 Registration

12.30-1.55 Buffet Lunch

Pole to Pole Phycology

Organisers: Johanna Laybourn-Parry and N. John Anderson

1.55 Introduction

Johanna Laybourn-Parry

2.00 Is global climate change driving a change in Antarctic marine protistan community composition?

Harvey Marchant

2.45 What can recent changes in diatoms from Arctic lakes tell us about global climate change?

Viv J. Jones and Nadia Solovieva

3.05 Relative importance of climate and lake ontogeny in regulating lake primary production and community structure in two Arctic lakes

Suzanne McGowan, Rene K. Juhler and N. John Anderson

3.25 Environmental factors correlated with chrysophyte cyst assemblages in low Arctic lakes south-west Greenland, and their potential for climate reconstruction.

Sergi Pla Rabes and N. John Anderson

3.45 Abundance and composition of phytoplankton communities in 300+ arctic, subarctic and cold temperate lakes

Kirsten Christoffersen, Bjørn Faafeng, Paal Brettum, Torben Lauridsen, Frank Landkildehus, Erik Jeppesen, Jens Peder Jensen and Susanne Amsinck

4.05-4.40 Refreshments

4.40 Are there latitudinal trends in inorganic carbon acquisition mechanisms in marine algae?

John A. Raven and John Beardall

5.00 Pacific-atlantic connections: a re-evaluation of the trans-arctic exchange

Jeanine L. Olsen and Wytze T. Stam

5.20 Environmental controls on diatom distribution in low arctic lakes of south-west greenland

E-mail: B.S.C.Leadbeater@bham.ac.uk
Tel: (+00 44) (0)121 414 5567. Fax: (+00 44) (0)121 414 5925

Please note: that accommodation for Friday evening is limited and preference will be given to those delegates travelling from overseas.

Students, please complete an application form for financial support (<http://www.brphycsoc.org/funding.lasso>) and submit it to Dr Eileen Cox by NOVEMBER 1st. You will then be notified of the contribution made to you by the Society before completing your registration form and submitting any outstanding payment.

Getting there

Birmingham is easily reached by car, plane, rail or coach and further details can be found here (<http://www.location.bham.ac.uk/directions.htm>).

Bianca Perrin and N. John Anderson

5.40 Community composition and seasonal succession of dinoflagellates in Antarctic lakes

Karin Rengefors, Johanna Laybourn-Parry and Gertrud Cronberg

7.00 Dinner

7.45 Meeting of the BPS Council

8.00 Wine reception and poster viewing

Thursday 6th January

8.30 Registration

Conservation and Biomonitoring

Organiser: Jan Krokowski

8.55 Introduction

Jan Krokowski

9.00 The Water Framework Directive And The Bureaucratic Mangle

Brian Moss

9.30 Can diatoms be used as a surrogate for phytobenthos?

Lydia King, Martyn Kelly, Roger I. Jones and Phil A. Barker

9.50 Using diatoms to assess 'reference conditions' in UK streams and rivers

Martyn G. Kelly, B. Jane Jamieson, Marian L. Yallop, Steve Juggins, Heike Hirst, Brian Rippey and Robin Guthrie

10.10 Selective real-time toxicity monitoring by an array chip biosensor employing diverse microalgae

Björn Podola and Michael Melkonian

10.30 Refreshments

11.00 Anthropogenic changes in algal communities: palaeoecological perspectives

N. John Anderson

11.20 Effects of climate change on current and future biomonitoring and conservation

Stephen C. Maberly and J. Alex Elliott



11.40 Process-based modelling as a tool for understanding water quality issues

Stephen J. Thackeray and J. Alex Elliott

12.00 The genetic structure of phytoplankton populations

Paul Hayes

12.20-1.30 Lunch

1.30 Marine and freshwater algae - a conservation perspective

Catherine Duigan, Gabrielle Wyn, Paul Brazier and Bill Sanderson

1.50 Important plant areas for marine and freshwater algae in the UK

Juliet Brodie, David M. John, Ian Tittley, Mary J. Holmes and David B. Williamson

2.10 Seaweeds and the European Water Framework Directive

Martin Wilkinson, Emma Wells, Paul Wood, Clare Scanlan, Jo Foden, and Mike Best

2.30 Opportunistic macroalgal blooms and the water framework directive

Jo Foden, Clare Scanlan, Emma Wells, Paul Wood, Martin Wilkinson and Michael Best

2.50-3.30 Refreshments

3.30-4.30 **The Presidential Lecture**

A lifetime with flagellates: living by the rules

Barry Leadbeater

4.30-6.00 BPS 53rd AGM

6.00 Committee meetings of A&T, B&C and C&E

7.30 Society Dinner

Friday 7th January

Session 1: The Manton Prize

8.55 Introduction

Barry Leadbeater

9.00 Establishing optimum conditions for the cultivation of *Palmaria palmata* in the sea

Maevae Edwards and Matthew Dring

9.20 The impact of seawater salinity on photosynthesis by the marine alga *Fucus vesiculosus*

Charlotta A. Nygård, Matthew J. Dring and Nils G.A. Ekelund

9.40 Variability in *Fucus spiralis* L.

Jane Pottas, Graham Scott and Sue Hull

10.00 Towards a revision of the taxonomy of the green algal genus *Acrochaete* (Chlorophyta)

Barbara Rinkel, Juliet Brodie and Paul Hayes

10.20 Community composition and dynamics of macroalgae in bedrock streams of the southern highlands, NSW, Australia

Lucy Nairn, Tim Entwisle and Barbara Downes

Session 2: Contributed Papers

9.00 Early warning of cyanobacterial blooms and toxins: aims and approaches

James S. Metcalf and Geoffrey A. Codd

9.20 Analysis of microcystin toxins in sediments and overlying water in Scottish and Thai waterbodies

Rattapoom Prommana, Louise F. Morrison, Marianne Reilly, James S. Metcalf and Geoffrey A. Codd

9.40 Eat poison to breed: how algal toxins increase the reproductive potential of *Daphnia pulex*.

Gary S. Caldwell, Loeki Janzen, Maria F. Mejia, Matthew G. Bentley and Susan B. Watson

10.00 Growth of planktonic diatoms under the ice in Lake Baikal

Chris Gibson and Tammi Richardson

10.20 Reassessing diatom cell ultrastructure: unlike many raphid diatoms *Craspedostaurax* (bacillariophyta) has a well-defined diatopium

Eileen J. Cox and Gabrielle M. Kennaway

10.40-11.10 Refreshments

Session 1: The Manton Prize cont...

11.10 Diatom motility in response to light

Deirdre McLachlan, Richard Geider, Colin Brownlee, Alison Taylor and Graham Underwood

11.30 Acute-toxicity effects of the diatom-derived toxin, decadienal, on the brine shrimp *Artemia salina* in the presence of sub-lethal concentrations of dissolved copper

Rebecca L. Taylor, Gary S. Caldwell and Matthew G. Bentley

11.50 Unicellular algae and cyanobacteria associated with epiphytic coatings on ornamental house plants in greenhouses

Efstathios P. Christeas, Andreas E. Voloudakis, Hans Sluiman and Panayota E. Kyriakopoulou

12.10 Immuno-gold localisation of microcystins in cyanobacterial cells, colonies and filaments

Fiona M. Young, Sabine U. Gerbersdorf, Calum Thomson, James S. Metcalf, and Geoffrey A. Codd

12.30 The 96-well membrane-microtiter plate system: a novel approach in the cultivation of microalgae

Eva C.M. Nowack and Michael Melkonian

Session 2: Contributed papers cont...

11.10 Halocarbons, anthropogenic and biogenic sources: an integrated review

Stephen M. Mudge, Claudio Bravo-Linares, Jorge Muñoz and Rodrigo Loyola

11.30 Volatile organic halocarbonated compounds produced by *Dunaliella tertiolecta* (butcher) at different stages of culture period

Jorge Muñoz, Stephen Mudge, Rodrigo Loyola, Claudio Bravo-Linares and German Hernández

11.50 Natural production of volatile organic halocarbonated compounds released by *Ulva rigida*, *Mazzaella laminariodes* and *Lesonia nigrescens*

Jorge Muñoz, Stephen Mudge, Rodrigo Loyola, Claudio Bravo-Linares and Marcelo Peralta

12.10 The oxidative burst in marine algae - multiple functions in disease resistance, biofilm control and halogen metabolism

Frithjof C. Küpper

12.30 Plasma membrane electron transport and reactive oxygen production in three marine *Thalassiosira* species

Margaret Davey, Angie Milne, Richard Geider and Alison Taylor

12.50 Lunch

1.30 Presentation of the Manton Prize and Poster Prize

1.45 Meeting of the BPS Council

Obituaries

Dr A.H.L. Chamberlain Botanist, Phycologist, Applied Biologist

In a conversation just a few weeks before his death, Tony said he was 'sorting out lectures for next term!' A stoic to the end, despite suffering a great deal of pain, his mind and memory as sharp as ever, and his spirit undaunted by the insidious cancer he was battling against.

After graduating with honours in Botany from the University of Leeds in 1969 Tony continued as a postgraduate student at the Leeds Botany Department and was awarded his PhD in 1974 for his thesis entitled 'Adhesive production and spore settlement in the red alga *Ceramium*'. During this time he gained practical skills as a light- and electron microscopist and these underpinned much of his earlier subsequent research on marine macro- and microalgal ultrastructure and cytochemistry whilst he worked as a Postgraduate Fellow at the University of Portsmouth.

Although much of his earlier work focussed on the mechanisms of attachment of algae, his spectrum of research gradually widened to fundamental studies on the structure and taxonomy of thraustochytrids and coccolithophorids as well as further applied studies, notably on attachment mechanisms of microorganisms in the context of fouling and contamination of food preparation surfaces and medical equipment. A firm believer in the value of the interdisciplinary approach in research, he regularly sought collaboration with physical chemists, spectroscopists and engineers in attempts to resolve fundamental problems.

Appointed Lecturer in Microbiology at the University of Surrey in 1977, Tony quickly made his mark as a teacher as well as a researcher, with special responsibilities for undergraduate courses in microbial ecology, cell biology, protozoology and environmental microbiology. The value he placed on the

practical side of biology teaching was evidenced by his enthusiasm for taking students on field trips and on visits to water works, sewage works and sites associated with his advanced courses on biodegradation and biodeterioration, especially the Mary Rose at Portsmouth. He was promoted to Senior Lecturer at Surrey in 1989.

During his 27 years at Surrey he worked diligently and conscientiously, and many of his undergraduate and postgraduate students will recall his academic rigour and patience. Tony also had administrative skills and as well as serving as Examination Officer for Microbiology degree programmes for many years he chaired a number of committees within and outside the University. He was Chairman of the University Board of Studies, the Level 1 Examinations Board and the University Sports Committee, as well as the Education Committee of the Surrey Wildlife Trust. He was also Convenor of the Bioengineering Group of the Society of Applied Biology and a long-standing member of the British Phycological Society, serving on Council from 1982 to 1985, and was Symposium organiser in 1988.

Erudite and eclectic, Tony had a deep love and knowledge of plants, and time with nature was his joy. He possessed a whiplash wit and was meticulously honest and straight, so that you always knew exactly where you were with him. A man of firm views, who was usually (but not always!) right, Tony was a good, steady friend and colleague, as well as a truly dedicated professional, who is sadly missed by all.

He is survived by his wife Helen, and their two daughters, Jo and Claire.

I am indebted to Dr Maurice Moss of the University of Surrey for his invaluable help.



A selection from some of the sixty peer-reviewed papers authored or co-authored by Tony:

- Barnes, L.-M., Zhdan, P., Watts, J., Adams, M.R. & Chamberlain, A.H.L., 2001. Correlated XPS, AFM and bacterial adhesion studies on milk and milk proteins to stainless steel. *Biofouling*, 17, 1-22.
- Chamberlain, A.H.L., 1997. Matrix polymers: the key to biofilm processes. In *Biofilms: Community Interactions and Control* (ed. J. Wimpenny, P. Handley, P. Gilbert, H. Lappin-Scott & M. Jones), pp. 41-46. Bioline: Cardiff.
- Daniel, G.R., Chamberlain, A.H.L. and Jones, E.B.G., 1988. Cytochemical and electron microscopical observations on the adhesive materials of marine fouling diatoms. *British Phycological Journal*, 22, 101-118.
- Hart, T.D., Chamberlain, A.H.L., Lynch, J.M., Newling, B. & McDonald, P.J., 1999. A stray field magnetic resonance study of water diffusion in bacterial polysaccharides. *Enzyme & Microbial Technology*, 24, 339-347.
- Kleijne, A., Jordan, R.W., Heimdal, B.R., Samtleben, C., Chamberlain, A.H.L. & Cros L., 2001. Five new species of the coccolithophorid genus *Alisphaera* (Haptophyta), with notes on their distribution, coccolith structure and taxonomy. *Phycologia*, 40, 583-601.

Dr Anthony Harold Lewis Chamberlain was born on 20 March 1947. He died on 5 March 2004, aged 56.

Len Evans



Dr William Eifion Jones (1925-2004)

William Eifion Jones died in a road accident on 29th March 2004. He was born and brought up in Aberystwyth and studied Botany there in the University of Wales after service in the army in India had toughened him up to weather the tutelage of the formidable Professor Lily Newton. He moved to Bangor in 1953 to join its newly founded Marine Biology Station as a lecturer with Dr Dennis Crisp, also formidable, as Director. He completed his PhD in 1957. He married Marian, secretary to the Station, and stayed in Menai Bridge for the rest of his life. He retired early, in 1986, but went on to teach in Kuwait, returning to do part-time lecturing in both Ocean and Biological Sciences in the University of Wales, Bangor.

His principal work was teaching and research on algae. His early studies were, amongst other things, growth and development of *Gracilaria verrucosa* but his interests turned more and more to ecology and field work. This is evident in his great success in leading field courses - to Sneem and Sherkin Island in Ireland so long as the College funds permitted, to Anglesey itself, of course, and to Harlech to study salt marshes in his last year of life. His chapter on 'Field Teaching Methods in Shore Ecology' (in *The Shore Environment* (ed. J.H.Price, D.E.G. Irvine and W.F. Farnham), vol. 1. Methods, 1980, Academic Press) is invaluable - his comments on safety on the shore ought to get more notice in these days of complicated and strict official instructions. His most important piece of work was on intertidal surveillance, aided by a team of five assistants. Followed up by statistical analysis this showed amongst other important information that the range of local variation, even between shores separated by short distances, makes the extrapolation of results from one



Eifion with field course students.

site to another a very risky procedure (in *Monitoring of the Marine Environment*, (ed. David Nichols), 1979, Institute of Biology).

With all this he was as well devotedly involved in many societies and trusts. He had joined the British Phycological Society in 1955 and served it as a Member of Council (1959 and 1974-77), as Assistant Secretary (1959) and Hon. Treasurer (1964-68). At the Eighth International Seaweed Symposium, held in Bangor in 1974 he was a member of the organizing committee and a hard-working local secretary. Outside phycology Eifion was editor of the *Natural History of Anglesey* published by the Anglesey Antiquarian Society in 1968. He was also a President of both the North Wales Wildlife Trust and the Bardsey Bird and Field Observatory, Chairman of the Menai Bridge Civic Society, a stalwart mem-

ber of the North Wales Branch of the Institute of Biology and of the Friends of the Treborth Botanic Garden.

Eifion was a well known and liked personality to many folks in North Wales in addition to his widely spread students and colleagues. In Menai Bridge he was well known for his lugubrious sense of humour and his appearance in shorts to mark what he decided to be the beginning of summer. His New Year Day 'At Home', supported hospitably by his family and reinforced by his own special brew of punch was always a popular and crowded event. Members of our own Society, as well as many others, will miss him greatly and join in sending deep sympathy to his wife and family.

Tony Fogg

Minutes of the 52nd Annual General Meeting Lancaster University 5.15pm on 6th January 2004

Present: 38 members were present.

Apologies: Maureen Callow, Jeanine Olsen, Wytze Stam, Thomas Wiedemann.

1. Minutes of the 51st AGM held 4th January 2003

The minutes were approved: proposed by Graham Underwood and seconded by Alison Taylor.

2. Matters arising

There were none.

3. Presidential Report

a) BSCL reported that most of the points he wished to discuss with members were included in the agenda but that a major issue to consider in the future would be that of membership to the Society.

b) The BPS publication *Out of the Past* was given to all BPS members attending EPC3. Remaining members will receive their copy by post. The book costs £10 to purchase. BSCL thanked Trevor Norton and Chris Maggs for their efforts. 500 BPS mouse-mats had also been manufactured and every delegate at EPC3 received one in their registration pack. The mats cost £5.00 to purchase.

c) BSCL suggested that the inclusion of a special session within the Winter meeting programme gave a focus to the meeting. BSCL suggested a special session on the 'Evolution and Systematics of Algae' but the membership preferred 'Post Genomic Phycology', proposed by Jim Callow. This would be discussed at the next BPS Council meeting.

Action: Discuss special sessions at next council meeting.

4. Reports from Officers

a) Honorary Secretary

JDP reported that 96 delegates had attended the Winter meeting and 39 papers and 21 posters had been presented. She gave thanks to all authors, particularly Rick Wetherbee and Chris Bowler, and all those who chaired the session. Thanks went to Maureen Callow and Alison Taylor for organising the cell-signalling session and the judges of the

Manton and Poster prizes. Finally, she thanked her research team for all their help in ensuring the smooth running of the meeting.

b) Honorary Treasurer

LES reported for his third and final time as Hon Treasurer and spoke to his annual report. He stressed that the financial health of the Society was very positive but that the Society should be doing more for the student membership. No applications had been received this year for summer bursaries. Supervisors should encourage their students to apply for funding. The journal had continued to perform well financially with the surplus for volume 37 standing at ca. £15K. In addition the new publisher, Taylor and Francis, guaranteed an income of £20K per annum. There had been an overspend on the Greenwich Winter meeting (2002) totalling £2883.23 which was just under the £3K overspend approved by council.

LES addressed questions from the floor and clarified that (i) the Honoraria were paid late and two years worth of payments would appear on the next statement, (ii) from now on, a yearly comparison of the accounts would be made (iii) even though the editorial office of other societies receive funding of ca. £20K per annum, the BPS is a charity and cannot extend to such funding. There are currently two editors, each paid an Honorarium of £1K and the office receives £3K per annum. Chris Maggs suggested the charity rules should be revisited to see how much support can be extended to the editorial office.

Action: JDP to revisit Charity rules

The Hon Treasurer's report was accepted: proposed by Chris Gibson and seconded by Graham Scott.

b) Honorary Membership Secretary

1) Graham Scott thanked the membership for their patience while the membership database was being re-designed from scratch. He urged members to update their email addresses on the upcoming membership renewal forms as a number of email addresses were incorrect and this prevented Society



information from being disseminated to these members via BPS-L.

2) As of the 1st December 2003 the Society had a total of 549 active members. During 2003 the Society gained 59 new members, mainly through active recruitment at EPC3. This proactive recruitment worked well and should be continued. John Anderson suggested that the Society should fund post-graduate students to attend International meetings and recruit members whilst there. The membership agreed.

3) Chris Gibson acknowledged that the position of Hon Membership Secretary was an extremely important role now, and in future, and gave a vote of thanks to Graham for all his efforts.

The Hon Membership Secretary's report was accepted: proposed by Mike Guiry and seconded by Stephen Maberly.

c) Honorary Editors of the Journal & EJPMC

1) Chris Maggs reported that her resignation was effective from this meeting and that Matt Dring was the new Editor-in-Chief for three years and Eileen Cox was the new Chief Editor in waiting, also for a period of three years.

2) The Impact Factor of the journal was perfectly respectable but she stressed to members that every citation counted and encouraged them to update their references. She informed the membership that she had also written to ISI to get the Journal listed with them. She thanked the associate editors and all those involved in the production of the journal. The EJPMC will address the issue of bringing in an on-line version of the journal to members.

3) Juliet Brodie acknowledged that Chris Maggs had done a wonderful job as Chief Editor of the Journal and this was reiterated by Barry Leadbeater who expressed deep gratitude to Chris for the phenomenal role she had played with regards to the journal and the general running of the Society.

The Hon Editor's report was accepted: proposed by Graham Underwood and seconded by John Raven.

d) Honorary Editor of *The Phycologist*

Alison Taylor reported that Issues 64 and 65 of *The Phycologist* were published and distributed in April and November 2003. She apologised for the late arrival of Issue 65 to some members. She was awaiting the results of the Communication & Education Committee Questionnaire, regarding possible changes to the current format of the magazine, but welcomed any suggestions from members

in the meantime. One suggestion was that the magazine should be available on the web.

The Hon Editor's report was accepted: proposed by Elliot Shubert and seconded by Eileen Cox.

e) Awards and Training Committee

Eileen Cox reported that some bursaries for student attendance at training courses and at the Lancaster meeting had been awarded. There had been a general lack of interest in the funding schemes this year and she appealed to supervisors to encourage their post-graduate students to apply for funding e.g. attendance at International conferences. Details of the application process are on the BPS website and the forms are very straightforward. BPS-L will be used in the future to send out reminders of funding opportunities.

The report was accepted: proposed by Chris Maggs and seconded by Elizabeth Howarth.

f) Biodiversity and Conservation

1) Juliet Brodie reported that the committee had been very active and had met three times during 2003. The committee had circulated a questionnaire via BPS-L and *The Phycologist* asking members to propose areas they considered important for algae. Over 150 sites were proposed and these had been taken to the IPA workshop hosted by Plant Life, in Manchester in October 2003. More areas were required to yield a comparable data set to that of the mycologists, and she encouraged members to submit more areas to the committee. Other information that was required from the membership was a list of potential species to include in a Red Data Book the committee were producing.

2) Juliet expressed thanks to Mike Guiry and Graham Scott for circulating all the committee's requests via BPS-L. She also expressed thanks to Dave John and all those involved with the production of the Freshwater Flora volumes. Chris Maggs thanked Juliet for her excellent work on the project. Juliet informed the membership that she was disappointed with the quality of the plates in Volume 1 3B and had asked Barry Leadbeater to write a letter of complaint to the publishers.

Action: BSCL to write a letter of complain to the publishers

The report was accepted: proposed by John Raven and seconded by Graham Scott.

g) Communication and Education

Jackie Parry reported that a questionnaire had been devised by herself, Graham Scott and Charmaine Blake which was circulated to the mem-

bership via BPS-L. There were also copies available at the Lancaster meeting which should be completed by those who had not already done so. The data have yet to be analysed. A specific wine reception for students and young post-docs had taken place on the second evening of the Lancaster meeting. This was hosted by Graham Scott and Charmaine Blake. Student comments would be discussed at the next Council meeting.

Discuss questionnaire results and student comments at the Summer Council meeting

The report was accepted: proposed by Elliot Shubert and seconded by Alison Taylor.

5. Archive Update

Barry Leadbeater reported that the BPS archive had been based at the Marine Biological Association (MBA) since 1st December 2003. It is to be a closed archive, only open by prior appointment with the archivist, Dr John Green.

6. Future meetings

Barry Leadbeater informed members that the next Winter meeting would be held at Nottingham University, hosted by Johanna Laybourn-Parry. No details or dates had been received to date but it was envisaged that the meeting would begin on the 4th January 2005.

7. Nominations for Officers/Ordinary members

Barry Leadbeater informed members that the terms of office of Paul Hayes, Maureen Callow and Thomas Weidemann (ordinary members) and Elliot Shubert (Treasurer) ended in January 2004. He thanked all council officers for their contribution to the running of the Society over the past 3 years, particularly Elliot for his important role as Hon Treasurer. Four nominations had been received by Jackie Parry. For the position of Hon Treasurer, Michelle Tobin had been proposed by Graham Scott and seconded by Jackie Parry. For the three ordinary membership positions, Geoffrey Codd (nominated by Elliot Shubert and seconded by Jackie Parry), Frithjof Küpper (nominated by Matt Dring and seconded by Chris Maggs) and Jan Krokowski (nominated by Jackie Parry and seconded by Barry Leadbeater). The membership accepted these nominations.

8. Any Other Business

Elliot Shubert reported that the auction held on the second night of the Winter meeting had raised around £500.

The meeting ended at 18.30h

Jackie Parry

Awards and Training – How to apply for BPS funding

The BPS council offers support for research students to attend BPS meetings and overseas meetings as well as student summer research bursaries. There is also funding available to assist participation in field courses. From time to time Council considers requests to support special projects, for example a contribution to support a meeting or symposium, support for collections, public understanding of science and special publications. An application form with details of how to apply is available in electronic format on the BPS website: <http://www.brphycsoc.org>

Alison Taylor

Call for nominations for BPS Council Officers

The term of office of our student representative and three ordinary members have been completed and the BPS Council therefore welcomes nominations for these posts to start in January 2005. Nominations in writing along with confirmation from the nominee that they are willing to stand should be sent to the Council Secretary, Jackie Parry, Department of Biological Science, Lancaster University, Lancaster, LA1 4YQ, UK, email: j.parry@lancaster.ac.uk by December 1st 2004.

Annual General Meeting

The Annual General Meeting of the British Phycological Society will take place at 4.30pm on Thursday 6th of January at Birmingham University.



2004

British Psychological Society

Council Officers (January to January)

President

Dr Barry S.C. Leadbeater (2003-2005)

President Elect

Professor Mike D. Guiry (2003-2005)

Immediate Past President

Dr Eileen J. Cox (2003-2005)

Vice Presidents

Professor Mike D. Guiry (2003-2005)

Dr Jeanine L. Olsen (overseas; 2003-2005)

Hon Secretary¹

Dr Jackie D. Parry (2003-2006)

Hon Treasurer²

Dr Michelle Tobin (2004-2007)

Hon Membership Secretary³

Dr Graham Scott (2003-2006)

Editor of the Psychologist⁴

Dr Alison R. Taylor (2002-2006)

Webmaster

Professor Mike D. Guiry

Editors of the European Journal of Psychology

Dr Eileen Cox (2004-)/Professor Matt J. Dring (2000-)

Ordinary Members of Council (3-year term of office)

Dr Frithjof Küpper (2004-)
Dr Rod Forster (2002-)
Dr Steven C. Maberly (2003-)

Professor Geoffrey A. Codd (2004-)
Dr Graham Underwood (2002-)
Dr David John (2003-)

Dr Jan Krokowski (2004-)
Dr Dagmar Stengel (2003-)
Miss Charmaine Blake⁵ (Student Rep. 2004-)

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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 is welcomed and should be supplied as JPEG or TIFF file 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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