



# Australasian Society for Phycology and Aquatic Botany

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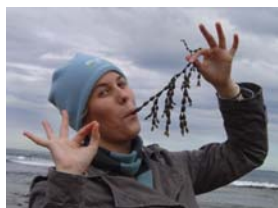
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## Editor's Corner



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**Prue McKenzie**  
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Welcome to the first issue of the ASPAB Newsletter for 2008! My name is Prue McKenzie and I am the editor for the ASPAB newsletter. For those who do not know me, I am a PhD student at Deakin University, Victoria studying the potential for long-distance dispersal in the brown alga, *Hormosira banksii* (Neptune's Necklace).

I hope you all had a lovely Christmas and New Year break and I hope that 2008 has started well for everyone.

The annual ASPAB conference last year in November was a great success. Thank-you to Alecia Bellgrove and her team of organisers for putting together such a successful meet. I'm sure I speak for all delegates that the food and wine was excellent, the art exhibition was amazing and oh yes; the papers presented were of very high standard. Congratulations to the students who were the recipients of the student prizes (details of awards are given in this issue).

The next ASPAB conference is being held with the Vth Asian Pacific Phycological Forum in Wellington, New Zealand from 10<sup>th</sup> – 14<sup>th</sup> November 2008. The website for further information is [www.appf2008.com](http://www.appf2008.com). I have also attached a flyer in this issue.

I have included in this issue applications for students who wish to apply for travel grants to ASPAB meetings or for overseas conferences/workshops. I

encourage student members to take advantage of these grants, especially for the upcoming ASPAB conference in Wellington in November 2008.

The next ASPAB Newsletter will be published in December 2008. If anyone would like to contribute to the newsletter, whether it is news, views, short articles, pictures, cartoons or anything else that may be of interest to the readers, your contributions would be most welcome. Please email me with your material before 30<sup>th</sup> November 2008.

I would like to take this opportunity to thank everyone who contributed to this issue. I look forward to more contributions from other members in the future.

## President's Message

**Lindsey White**  
ASPAB President

Hi, I am Lindsey White (not Zemke-White anymore, I am reverting to my pre-marital name), and the New President of ASPAB. I am pleased to take on this role, and hope I can help to move the Society forward in the coming year.

I am a Senior Lecturer at Auckland University of Technology, where I lead the Programmes in Aquaculture and Environmental Studies. My main research interest lies in seaweed utilisation, by humans in some regards, but I mainly concentrate on utilisation by herbivorous fishes in a field called nutritional ecology.

Rather than give you a big background, I thought I would tell you a little bit about John Steinbeck, my favourite author and his views on science. While on holiday this year I found his complete works in a second-hand bookstore. For those of you who have read "Cannery Row" (or seen

the movie) you will remember the character of “Doc” the eccentric Marine Biologist who runs a laboratory and collects and preserves marine animals to supply to Universities for dissection etc. Well it turns out that “Doc” was real guy, Ed Ricketts, a friend of Steinbeck’s, and Steinbeck ended up being a partner in the laboratory business and a pretty good amateur marine Biologist himself.

Just before the Second World War Ricketts and Steinbeck went on a six week collecting expedition to the Gulf of California (also called the Sea of Cortez) and this trip is chronicled in the book “Sea of Cortez”. The following passage struck me as a good explanation for why we do the strange and arcane experiments and observations that scientists are want to do. Steinbeck and Ricketts were constantly asked by the local Indians why they did what they did?

“A number of times we were asked. Why do you do this thing, this picking up and pickling of little animals? To our own people we could have said any one of a number of meaningless things, which by sanction have been accepted as meaningful. We could have said, “We wish to fill certain gaps in the knowledge of the Gulf fauna.” That would have satisfied our people, for knowledge is a sacred thing, not to be questioned or even inspected. But the Indian might say, “What good is this knowledge? Since you make a duty of it, what is its purpose?” We could have told our people the usual thing about the advancement of science, and again we would not have been questioned further. But the Indian might ask, “Is it advancing, and toward what? Or is it merely becoming more complicated? ? The lies we tell about our duty and purposes, the meaningless words of science and philosophy are walls that topple before a bewildered little “why.” Finally we learned why we did these things. The animals were very

beautiful. Here was life from which we borrowed life and excitement. In other words, we did these things because it was pleasant to do them.”

This sentiment may or may not apply all scientists. In the current climate of competitive funding, we must all make up stories about how important our investigations are, and certainly we would like to have our work progress human knowledge towards “knowing” the truth about the way the world works, but after all, don’t we really do what we do, collect, preserve, experiment etc, because it pleases us to do so?

## **Minutes of the 2007 ASPAB Annual General Meeting**

**Held: 28<sup>th</sup> November 2007, Deakin  
University, Warrnambool**

*Meeting opened: 2pm*

**Apologies:** Philip Orr

### **Minutes of the previous meeting:**

It was accepted that they were an accurate record of the meeting held on 23<sup>rd</sup> January 2007. Proposed by Joe Zuccarello and seconded by Kirsten Heimann.

Business arising from minutes: There was no business arising from the previous meeting’s minutes.

### **President’s report:**

- Website is up and a request was made to send information, job details, conference reports and any other news so that it can be posted.

- Challenges into the future include maintaining our membership level (14 new members joined as a result of the Deakin University conference) and increasing our public profile. We can be

more vocal in our stance on important issues such as climate change.

- There's a bid to hold the next International Psychological Congress in Australia. Info about IPC is on their website.
  - The next ASPAB conference will be held jointly with the Asia Pacific Psychological forum from 10 – 14 November, 2008.
  - Gratitude to Alecia and the team for hosting this meeting.
  - Also thanks to Jacquie Polkington who has been serving in the public officer position since Karen Kevekordes stepped down.
- Report moved for acceptance. Proposed by Kirsten Heimann; seconded by Nick Paul.

### **Treasurer's Report:**

No student grant was paid from Australian funds during the year. One should have been paid but was delayed until this financial year. The awarding system clearly needs to be streamlined. Again the cost of the Newsletter was nil. Most people now receive it electronically so the cost is low and so far Deakin University have generously absorbed it. The Statement includes two years incorporation fees and a time-extension fee.

In June 2007 the deposit account was reinvested for 8 months at the best rate available, 6.30%.

These accounts have not yet been audited, they are so simple that it seems preferable for them to be done at the same time as next year's.

The Society continues to accrue funds and could clearly afford to support more student travel.

### *Membership*

Paid up members were as follows:

	2002 / 3	2003 / 4	2004 / 5	2005 / 6	2006 / 7
<i>Full</i>	49	40	44	43	44
<i>Student</i>	12	5	7	15	22
<b>Total</b>	<b>61</b>	<b>45</b>	<b>51</b>	<b>58</b>	<b>66</b>

Full membership has remained remarkably static. The boost in student membership occurred at the Hobart meeting where there was a considerable differential between the registration fees for members and non-members so they may not stay with us. Suggested ASPAB funds could support a voluntary levy for carbon credits in future conference registrations. John West made the point that carbon credit contributions should not go to a political party.

Treasurer's report moved for acceptance. Proposed by Nick Paul, seconded by Martina Doblin.

### **Elections for Committee Positions:**

Shauna Murray is unable to continue in her role as a member of the ASPAB committee. We thank her for the years of support she's shown ASPAB.

Di Walker held the elections and the candidates for committee positions were as follows:

<b>Position</b>	<b>Nominee</b>	<b>Proposer</b>	<b>Second</b>
President	Lindsey Zemke-White	John Beardall	Kirsten Heimann
Vice President	Alecia Bellgrove	Joanna Jones	Lindsey Zemke-White
Secretary	Martina Doblin	David Thomas	Judy Broome
Treasurer	Joanna Jones	Di Walker	Wendy Nelson
Committee Member / web master	Philip Orr	John Beardall	Prue McKenzie
Committee member	Joe Zuccarello	Lindsey Zemke-White	John Beardall
Committee member	Prue McKenzie	Jackie Polkington	Peter Ralph
Committee member	Judy Broome	Tracy Farr	Kirsten Heimann

Note: After the meeting, Joanna Jones was concerned we'd made an error and we had a committee member position open. Discussion amongst the executive



determined that at the Sydney conference, we had decided to make one of the committee positions a student representative. Whether a student representative sits on the committee or not, there will always be 4 members plus the president, VP, secretary and treasurer.

#### **General business:**

- a) Next conference to be held in Wellington on 10 – 14 November, 2008.
- b) Setting up an email list equivalent to Algae-L to facilitate quick and easy discussion amongst ASPAB members. AustAlgae is an unmoderated email discussion group which aims to encourage communication between people interested in any aspect of Australian freshwater and marine algae. Glenn McGregor manages this and would be happy to include ASPAB members – seems a better option rather than creating another email list. Judy Broom indicated she would follow this up.
- c) ASPAB sponsored book. Di Walker, Gustaaf Hallegraeff, John Beardall and Joe Zuccarello met to discuss potential chapters and contributors. A draft of the book chapters will be distributed to members for feedback. The focus needs to be on Australia and New Zealand, with the topics being about contemporary issues. A point was made that the authors don't necessarily have to be ASPAB members.
- d) The climate change report recently released by CSIRO contained errors and misinformation. ASPAB would like to draft a response and send around to members for input. In addition, ASPAB would like to comment on the New Scientist article about urea dumping in the ocean to mitigate climate change. Martina will follow up with Michele Burford and work with John Beardall on this.
- e) Mission statement. Committee will draft and circulate to membership.
- f) Directory of expertise in the society so

that enquiries can be directed to appropriate specialists. Some discussion about posting email addresses or a list of current members. No decision made as to whether this would go ahead.

g) The Australian Research Network for Algal Toxins (ARNAT) – Alecia contacted them for links with ASPAB but didn't get a response. Phil Orr may pursue this (Martina to ask).

**Signed: Martina Doblin, 23 January, 2008.**

## **Reflections on ASPAB Conference 2007**

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### **Alecia Bellgrove**

ASPAB met for its 22<sup>nd</sup> annual conference at Deakin University, Warrnambool campus from 26<sup>th</sup> – 29<sup>th</sup> November 2007. Fifty delegates from throughout Australia and New Zealand attended to discuss recent research in phycology and aquatic botany.

A key theme of this year's conference was the *Implications of Climate Change for Marine Plants*. Assoc. Prof. Peter Ralph of the University of Technology, Sydney gave a plenary address on this theme. He cautioned that the key models that are being used to predict the consequences of climate change are primarily physical models with at best only modest data on sea-surface chlorophyll concentrations as the biological component. Assoc. Prof. Ralph emphasised that much of our biological research is relevant to understanding the impacts of climate change but we need to get this research into the models. The challenge he put out was that biologists need to understand and collaborate with the modellers and vice versa in order to achieve a new level of understanding and better predictions of

the potential impacts of climate change. The plenary address was followed by a series of eight presentations presenting research examining potential impacts of climate change on phytoplankton, seagrasses and other aquatic plants.



*L-R: Alecia Bellgrove, Joanna Jones, Di Walker*

Amongst these presentations Prof John Beardall of Monash University and immediate past-president of ASPAB discussed the implications of increased carbon dioxide and UVB radiation on nutrient acquisition of phytoplankton. Prof Beardall explained that phytoplankton species differ in their ability to use carbon which will likely result in shifts in phytoplankton assemblages in a high carbon dioxide environment. In addition, his research shows that other nutrients (such as nitrogen and phosphorous) are also stimulated with increased uptake of carbon, but not equally. Fatty acids of the phytoplankton are also affected. These results suggest that increases in carbon dioxide will result in changes in nutritional value of phytoplankton for higher trophic levels and potential changes in the species composition of phytoplankton, zooplankton and fish communities. The session of presented papers concluded with a fruitful open discussion forum, discussing the broad context of the research presented and the role ASPAB may take in better communicating the importance of our research to modellers, government and policy makers.



*L-R: John Beardall, Gustaaf Hallegraeff, Slobodanka Stojkovic, Kirsten Shelly*

Prof Gerry Kraft, recently retired from the University of Melbourne, gave an entertaining retrospective of his 'career path' and the defining moments that lead him to becoming one of Australia's most well-known and well-respected algal taxonomists. This plenary presentation was followed by a series of papers discussing the recent advances in taxonomy and phylogenetics of marine seaweeds in particular. The power of molecular markers to disentangle cryptic flora and phylogenetic relationships, but the importance of also linking this molecular information with definable morphological features was emphasized by several presenters. Despite a national recognition of the importance of understanding and maintaining our native biodiversity, it is of concern that there also appears to be a trend of declining funding for fundamental taxonomical research. Without a thorough understanding of the diversity of our aquatic flora it will be difficult to assess changes to biodiversity caused by climate change or indeed detect new and potentially invasive species.



*L-R: Alecia Bellgrove, Prue McKenzie, Jacqui Pocklington, Erasmo Macaya*

Toxic microalgae in both marine and freshwaters pose a risk to human health, livestock health and the health of native species such as fish, seabirds and mammals. Dr Lesley Rhodes leads the Seafood Safety programme at the Cawthron Institute in New Zealand and presented an engaging plenary presentation with an over-view of the impacts of harmful algal blooms, the measures for early detection and prevention, and the potential pharmaceutical benefits of some toxic microalgae. Dr Rhodes explained that many toxic macroalgal species are dependent on several trace metals (such as copper, iron, zinc etc) such that very small changes in the availability of these trace metals can cause dramatic changes in the production and abundance of toxins. Changes in land-use and runoff, particularly in an environment of declining water resources, can thus have large impacts on the abundance and severity of harmful algal blooms. Interestingly though, Dr Rhode's research shows that some of the most toxic microalgae may also act as neuroprotectants for patients with neurological disorders. For example, domoic acid, a neurotoxin found in marine diatoms that resulted in the death of 70 dolphins, 200 sea lions and 200 seabirds from a bloom in Monterey Bay in 2002, can also be used to pre-condition patients reducing seizures.

The scientific programme continued with presentations discussing the colonisation processes of marine and freshwater algae and an importance of an understanding of these process to the management of aquatic systems, introduced species, and ecological and chemical interactions between algal and invertebrates.



*L-R: Gerry Kraft, Kyatt Dixon*

An important aspect of any conference is the opportunity to network with colleagues, discuss research and potential collaborations. To achieve these aims and simultaneously showcase the Warrnambool Campus and local produce a number of social events were organised. The conference began with an icebreaker function on Monday night at the Customs House Gallery allowing delegates to also see the *Kaisou - Plants of the Sea* exhibition (see below). This event was generously sponsored by Otway Estate Winery, Wauru Ponds Estate Winery and Timboon Farmhouse Cheese. The remaining social events were held at the SUB bar at Deakin University, Warrnambool Campus. An informal pizza evening was held on Tuesday on the outdoor deck overlooking the Hopkins Estuary. A poster session was held on Wednesday afternoon and a semi-formal sit-down dinner was served on Thursday night as the concluding function. The SUB bar was a fantastic facility for the variety of social functions and many delegates remarked on what a wonderful venue it was. Particularly they liked the collegiality of delegates staying on



residence and also have the social functions on campus with such a spectacular view. With the addition of a kitchen the SUB would allow even more flexibility for a variety of functions.



*SUB bar where ASPAB social functions were held*

To promote an understanding of the amazing biodiversity of seaweeds in our region and their incredible beauty, in conjunction with the annual ASPAB conference we hosted an exhibition at the Customs House Gallery, Gilles St Warrnambool from 22<sup>nd</sup> November – 2<sup>nd</sup> December 2007. Additionally we held a series of community workshops during the same period. The exhibition was a collaboration of three artists presenting their work with aquatic plant themes in three different media:

**Michiyo Noda** was invited from Japan for this exhibition. Michiyo graduated from Joshibi Junior College of Art and Design in 1968. She is the founder of *Algal Design Studio*, a part-time member of staff at Shimoda Marine Research Center of University of Tsukuba, chairperson of the Association of Kaisou Oshiba, and a member of The Japanese Society of Phycology. She has been creating and exhibiting beautiful kaisou-oshiba (pressed algal designs) works for over 20 years. She has participated in 10 major exhibitions and has 3 permanent exhibitions throughout Japan. She has also co-authored two books. Her inspiration first came from working as a research assistant to Professor Yokohama,

past director of the Shimoda Marine Research Centre in Shizuoka prefecture, Japan. Michiyo is active in environmental education throughout Japan. She has been running community workshops and lectures to teach others (from preschoolers to seniors) the art form and to instil an appreciation of the beauty and importance of *kaisou*. She has even run these workshops for the Emperor and Empress of Japan and their family!



*L-R: Alecia Bellgrove, Michiyo Noda, Chisako Ishikawa*

**Dr Martina Doblin** completed a Bachelor of Science with Honours at Monash University and a PhD at the University of Tasmania. She then worked as a postdoctoral research fellow at Old Dominion University in the USA. Martina is now based at the University of Technology, Sydney. Martina's research focuses on phytoplankton, the microscopic algae and bacteria that live in water. Some species form harmful algal blooms, but all phytoplankton have the potential to be transported in ships' ballast water (a mechanism that disperses them around the world faster than ocean currents). Martina's research has contributed to our understanding and control of both these problems. Inspired by colleague Lisa Drake's vibrant images of marine plankton taken with a digital camera attached to a microscope, Martina initiated a project to increase awareness of Art in Science. Her intent in this work



is to show that these tiny organisms are incredibly diverse and exert a powerful influence over the world around us. The cells featured in her images are examples of microscopic algae, some of which can be harmful to animals and humans. She creates images of phytoplankton using a microscope with prisms and filters to manipulate light, resulting in forms with striking colour and exaggerated 3-dimensional appearance. She has exhibited in both the USA and Australia and has been involved in curriculum development and outreach programmes:

**Prue Addison** completed a Bachelor of Science with Honours at the University of Melbourne and has worked as a research assistant at the Museum of Victoria. Blending her interest in marine life with her passion for jewellery making, she started making jewellery with marine themes. Prue now works part-time as an environmental consultant and part-time creating her beautiful jewellery.

Whilst in Warrnambool Michiyo Noda conducted several sampling trips to collect beach-cast seaweeds from the local area. She then used these local seaweeds in a series of community workshops to promote an environmental awareness of the ecological importance of seaweeds and an appreciation of their beauty. Instructing through an interpreter, Chisako Ishikawa, Ms Noda conveyed her passion to approximately 120 eager participants in the workshops. The following algal design workshops were conducted:

- Florence Collins Kindergarten: 20 participants
- Cudjee Primary School P - 6: 28 participants
- Customs House Gallery: 16 participants including local artists, TAFE students and some international tourists

- Cudjee preschool playgroup: 19 participants
- Warrnambool Primary School Grade 3: 28 participants
- ASPAB delegates: 10 participants

Regretfully, several other groups were interested in the workshops but could not be accommodated in the limited time frame of Ms Noda's visit. For those who participated however, these workshops were received with overwhelming enthusiasm and all thoroughly enjoyed the experience. Parents of children involved in the workshops reported that the children were abuzz with tales of their workshop, their artwork they created and how wonderful seaweeds are – just the sort of impact we were hoping to achieve! Participants in the workshops created their own piece of algal design artwork on postcards or bookmarks. These were pressed, dried and laminated by Michiyo Noda and returned to participants. Some examples of the works created follow this report.



*ASPAB delegates participating in the seaweed art workshops (Di Walker, Joanna Jones, Martina Doblin)*

In planning this conference the local organising committee made the choice to produce as sustainable a conference as possible, whilst also maintaining registration fees at a level acceptable to the ASPAB membership and particularly the student membership.

Our main aims were to:

- Minimise waste through the use of china and glassware for meals and reusable water bottles
- Minimise waste through encouraging caterers to avoid packaging wherever possible
- Minimise waste through careful consideration of what is put in delegates satchels
- Recycle all materials acceptable to municipality
- Using as much organic and fair-trade products as possible
- Using as much local produce as possible to reduce carbon production due to transport
- Purchase carbon credits to offset carbon produced by delegates travelling long distances to the conference

We are please to announce that we have met the first 6 aims through various initiatives and with the assistance of sponsorship of water bottles from Wannon Water. We also registered as a Waste Wise event. The final aim of purchasing carbon credits for all delegates has been difficult to achieve within the tight budget set by keeping registrations low. Remaining funds will be used to purchase carbon credits.

On the eve of a federal election in which environmental issues and particularly climate change finally took centre stage, we were encouraged by the relative ease of meeting our aims of sustainability. There are useful resources available to event organisers and we have found local businesses have been enthusiastic in assisting us through various forms of sponsorship. We would encourage future ASPAB conference organisers to exceed our achievements of sustainability.

## Abstracts of presentations by award recipients

### Best Oral Presentation: David Rivers

#### A test of the seagrass deep edge as an indicator for water clarity

<sup>1</sup>Rivers, David, <sup>2</sup>Frederick T. Short

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Many seagrass meadows are declining due to reduced water clarity associated with coastal development, and detecting changes in water clarity has become an important seagrass management issue. The seagrass deep edge – defined as the deepest occurrence of seagrass in a meadow – is potentially a useful indicator for monitoring changes in water clarity. We tested this indicator by comparing the deep edge response to seasonal vs. long-term changes in light. Deep edges at five eelgrass (*Zostera marina*) meadows in the Great Bay Estuary, New Hampshire, USA, were monitored seasonally by tracking changes in the deep edge location using fixed transects. Light reaching the deep edge plants was compared to an estimated 11% minimum light requirement for seagrasses. The average location of the deep edge was stable seasonally at three meadows. At two meadows, notable eelgrass loss occurred during the second year of monitoring. The deep edge at these sites receded 3 meters upslope, resulting in the meadow edge becoming 0.5 – 0.75 meters shallower depending on site bathymetry. At sites where eelgrass declined, light reaching the deep edge fell consistently below the 11% minimum light requirement. At the remaining sites, light never fell below 11% for more than two

consecutive sampling periods. The deep edge is sensitive and responds specifically to long-term reductions in light, confirming its suitability as an indicator. As a management tool, the deep edge is reliable indicator capable of detecting water clarity problems with as little as 1.3 meters lateral loss of seagrass meadow.

#### **Best Oral Presentation: Peter Martin**

##### **The phylogeny of *Lessonia* and phylogeography of *Lessonia variegata* (Laminariales) in NZ**

Peter Martin, Joe Zuccarello  
School of Biological Sciences, Victoria University  
of Wellington, New Zealand  
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The genus *Lessonia* is solely distributed in the southern hemisphere, with several species found in South America and Australasia respectively. As five species are described in each region we have to consider two possible centres of origin. Further, the New Zealand endemic *Lessonia variegata* is widely distributed throughout the rocky reefs of the three main islands. Our goal was: a) to determine the relationships between *Lessonia* species from the southern hemisphere; b) to determine the phylogeography of *L. variegata*, and to assess the degree of differentiation within known bioregions and c) to test the assumption that the distribution of the *L. variegata* lineages matches known patterns of species distribution based on contemporary current patterns. To resolve the southern Hemisphere relationships we combined mitochondrial, chloroplast, and nuclear markers in a comprehensive dataset. To investigate the phylogeography of *L. variegata* we used SSCP to screen mitochondrial atp8-spacer haplotypes in populations across the species range. The generic relationships reveal that the South American *Lessonia* species are a sister group to the monophyletic Australasian *Lessonia*'s suggesting a single dispersal

event (east to west) across the Pacific Ocean. *Lessonia variegata* shows unexpected high level of genetic differentiation with 4 well-supported lineages, justifying a split into four species. The distribution of the different *L. variegata* lineages is shown to be restricted with sharp genetic breaks, e.g. at East Cape. Despite a similar break at Cape Campbell that separates North Island lineages from South Island lineages specimen from the Wellington lineage were found as far south as Curio Bay indicating potential contemporary dispersal.

#### **Best Poster Presentation: Lee Hudek**

##### **Molecular basis for zinc uptake and efflux by *Nostoc punctiforme*: Towards the development of a potential phytoremediation tool**

Lee Hudek, Agnus Michalczyk, David Freestone, Maria Gibson, and M. Leigh Ackland  
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Heavy metals have been established as having significant detrimental impacts on the environment. While zinc has been identified as a problem in the environment, there is a lack of economical and effective treatment methods for zinc-contaminated waters. One method that could be applied for treating zinc-contaminated waters is phytoremediation. Cyanobacteria are established as suitable for bioremediation use and indicate a potential for use in phytoremediation. In vivo determination of the potential of *Nostoc punctiforme* in phytoremediation applications was predicted by analysing the viability and genomic response to ZnCl<sub>2</sub>. *Nostoc punctiforme* was found to tolerate ZnCl<sub>2</sub> concentrations as high as 3.5 mg/L before toxicosis occurs. Three identified zinc-uptake genes and one identified zinc-efflux gene, showed significant up-



regulation in response to 3 mg/L ZnCl<sub>2</sub>, for 3 hours of exposure. At 24 hours of exposure both zinc uptake and efflux genes demonstrated significant down regulation, and by 72 hours further down regulation of zinc uptake and efflux genes occurred. Fluorescent localisation experiments illustrated that intracellular zinc concentrations were low in live cells and that zinc has a higher affinity for binding to dead cells. Quantification of intracellular and extracellular zinc confirmed that intracellular zinc concentrations were low, and that significant levels of zinc bound to the cell wall. These results suggest that *N. punctiforme* would not be suited for all phytoremediation applications as the live cells do not have a large capacity to remove zinc from contaminated waters. These findings indicate that *N. punctiforme* would be best suited for phytoextraction applications as zinc has a high affinity for adsorbing to *N. punctiforme* cells, particularly dead cells.

## Research News



### New ASPAB email list

An email list (ASPAB-list) has been set up for ASPAB members. All current members should receive an invitation to subscribe to the list, and new members will be invited to subscribe as they join the society. If you have not received an invitation, you can subscribe to the list over the web at <http://lists.otago.ac.nz/listinfo/aspab-list>. We hope that members will use the list to raise any topics of general interest, and to let one another know about events and opportunities. From time to time the Committee will use the list to communicate with members. We don't anticipate this being a high volume list, and we encourage all members to try it out. You can unsubscribe easily from the

same webpage, if you decide it is not something you want to be a part of. If you have any questions about the list or difficulties subscribing, please contact the list manager, Judy Broom ([judy.broom@otago.ac.nz](mailto:judy.broom@otago.ac.nz))

### Stewart Island, New Zealand

#### Dr Lindsey White

Last December I went on an expedition to Stewart Island, off the South island of New Zealand. I call it an expedition, rather than a research trip for a couple of reasons. First and foremost, it sounds more romantic and adventurous. But mainly, its because it felt like an expedition. We flew down to Invercargill; myself, Dr. David Raubenheimer, Dr. Kendall Clements, Liz Laman Trip and Jethro Johnson (Ph students of David and Kendall respectively), and Murray Birch (skipper of the University of Auckland's research vessel). There waiting for us were many pallets of scientific supplies that had been sent on ahead. It was during the unpacking, checking, repacking, filling of liquid nitrogen dewars, and getting all of this gear stowed on the charter boat that it began to feel like an expedition.

To back up a minute, I should explain that this trip was funded by a Marsden Grant to Kendall and David. The grant is to look at latitudinal differences in fish herbivory, hence the visit to the southern reaches of New Zealand. I was invited along as a token Phycologist. That and Kendall was my PhD supervisor ? it never hurts to have friends.



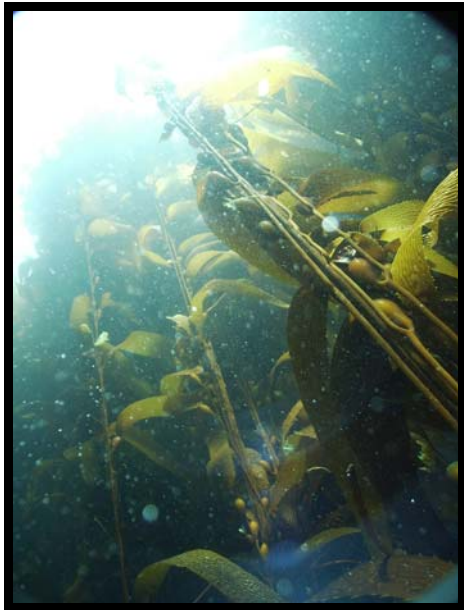
The Charter was the “Jewel” an ex crayfishing boat with a big long open back deck, perfect for working on. We left from Bluff and made the crossing to Stewart Island in good weather. Cell phone reception ran out soon after leaving Bluff, to the consternation of some and the joy of others. We were very lucky with the weather for almost the entire trip ? blue skies, balmy, very little rain.



The main aim of the trip was to collect (I say collect, I mean hunt with a speargun) two types of fish; *Odax pullus* (the butterfish, so called I believe for its lovely taste) and *Notolabrus fuscicola* (the banded wrasse, a non-herbivore for comparison - eaten only by the truly desperate). David and Kendall did most of the shooting, Murray ran the tender, while Jethro and Liz processed the fish. Each fish was truly well used. Jethro excised the gut, striped off and kept any fat on the intestinal tract, and kept the contents of the GI tract as well. Liz took the brain, otoliths, fin clippings for DNA

work, and gonads. Fillets were taken from the butterfish for later gustatory research.

I assisted were needed and carried out some work that complements David and Kendall’s project. The Butterfish eat a lot of *Macrocystis pyrifera*. I am interested in the variation of nutrients both with depth, and along each lamina, and whether the fish are targeting nutrient rich plants or parts of plants. It quickly became apparent by general observations that Butterfish seems to prefer the basal part of the *Macrocystis* lamina, and it would be interesting if they were targeting this area for nutritional reasons. I collected a number of lamina, subdivided them into five segments (basal inside, basal outside, middle inside, middle outside, distal portion). These were frozen in liquid nitrogen for later analysis. Then I collected 100 lamina that showed evidence of butterfish feeding. They leave quite distinctive semicircular or circular bite holes, so these are easy to select. This lamina were frozen, brought back to the lab and there we subdivided them into the five segments and recorded bites from each segment. The graph below shows that the fish do indeed target the basal outside part of the lamina. Now comes the really hard work. Doing the nutritional analysis on the hundreds of samples stored in liquid nitrogen!



So anyway, that is the science part of the trip. As we all know the best parts of these trips are not always just the science. The food was at times somewhat rustic. For those of you who have never travelled to the deep south of New Zealand, you may not be aware of the culinary delights of the region's fisherman. The pizza sandwich is a great treat, topped only by the meat pie sandwich. However, while these more rustic elements were peppered throughout the week, the seafood we enjoyed was truly lovely. We had scallops with the largest adductor muscles I have ever seen, crayfish, smoked Blue Moki and Trumpter, Blue Cod, the odd Butterfish here and there, and Paua (abalone for you Aussies) that was so big that when the skipper made them into steaks they had to be sliced into three great slabs.



But as with all expeditions, the best part is the people. The conversations about science and the new ideas that spring from these discussions. What the funding types do not appreciate is that many a great idea for future research has come from this kind of relaxed, easy, familiar, session. It takes time for thought, time for these ideas to percolate through the brain, to distill. It takes some argument with colleagues to beat the ideas into shape. This is one of the main benefits of research trips and conferences. They provide time to confer with colleagues and friends, time to make new colleagues and friends, time to think.



So the trip was a great success. We shot many a fish, collected many algae, came up with new ideas for future grant proposals, new plans for other



expeditions. I can't think of how many times when I have told people that I am a marine Biologist, they say "wow that must be great, I always wanted to do that". You know, they are right, it is great.

## Phycology in the Antarctic Sea Ice

Katherina Petrou (PhD Candidate,  
University of Technology, Sydney)  
Assoc. Prof. Peter Ralph & Dr Martina  
Doblin (supervisors)



*Microphotographs of various diatoms from the bottom sea ice communities*

In September and October of this year, Katherina Petrou was amongst a select group of scientists on board the *R.V. Aurora Australis*, taking part in the Sea Ice Physics and Ecosystem eXperiment (SIPEX). SIPEX was a six-week expedition designed to explore the sea-ice zone around East Antarctica, investigating the relationship between the physical sea ice environment and Southern Ocean ecosystem. As one of Australia's contributions to International Polar Year (IPY), SIPEX included scientists from 8 different countries working on specific projects to contribute to the greater understanding of the Antarctic sea ice ecosystem.

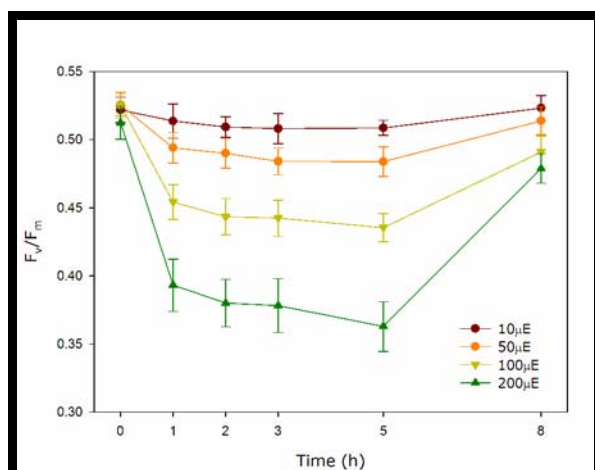


*Aurora Australis on the ice*

Katherina's involvement in SIPEX formed part of her PhD, which investigates the photophysiology of Antarctic phytoplankton under the threats of climate change. Her principle objective during SIPEX was to investigate the photosynthetic health and plasticity of bottom sea-ice algae under a future scenario of sea-ice thinning. Katherina tested the photosynthetic response of sea-ice algae to different light intensities and examined their ability to adapt to different irradiances, measuring their recovery following exposure.



*Katherina sectioning an ice core*



Maximum quantum yield of Photosystem II ( $F_v/F_m$ ) for 10, 50, 100 and 200  $\mu\text{mol photons m}^2 \text{s}^{-1}$  during 5 hours of exposure and after a 3-hour of recovery ( $T=8$ ) at 10  $\mu\text{mol photons m}^2 \text{s}^{-1}$  (control).  $n=5 \pm$  standard error of mean (unpublished data).

For more information go to:

[www.sipex.aq](http://www.sipex.aq)

[http://www.science.uts.edu.au/des/StaffPages/PeterRalph/katherina\\_petrou.html](http://www.science.uts.edu.au/des/StaffPages/PeterRalph/katherina_petrou.html)

<http://www.aqob.com.au> (radio interview 2SER)

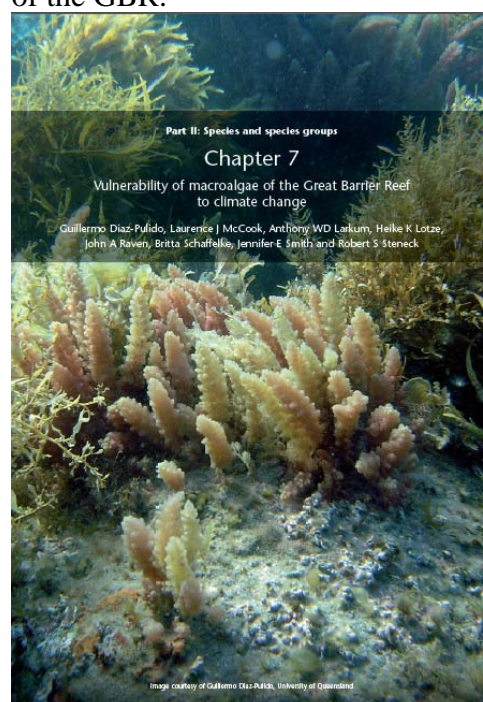
## Book Review

### Vulnerability of macroalgae of the Great Barrier Reef to climate change

Guillermo Diaz-Pulido

The Great Barrier Reef Marine Park Authority and the Australian Greenhouse Office have recently published a book of the Great Barrier Reef's vulnerability to climate change. One of its chapters is dedicated to macroalgae, Diaz-Pulido G, McCook LJ, Larkum AWD, Lotze HK, Raven JA, Schaffelke B, Smith JE, Steneck RS (2007) *Vulnerability of macroalgae of the Great Barrier Reef to climate change*. In: Johnson JE, Marshall PA (Ed) *Climate change and the Great Barrier Reef*. Great Barrier Reef Marine Park Authority & Australian Greenhouse

Office, Townsville, pp 153-192 [ISBN 9781876945619]. The chapter provides the most comprehensive review of the vulnerabilities of the different functional groups of coral reef benthic macroalgae (including algal turfs, calcified and fleshy upright macroalgae and crustose calcareous algae) to climate change drivers. Changes in ocean circulation, water temperature, ocean acidification, ultraviolet radiation, sea level rise, tropical storms, river flood plumes, and changes in substrate availability due to coral mortality will have important consequences for the physiological and ecological processes of reef algae. The authors suggest that ocean acidification due to rising atmospheric  $\text{CO}_2$  and increasing sea temperature are perhaps the most critical factors that will drive changes in the benthic algal communities of the GBR.



The book is available from: Great Barrier Reef Marine Park Authority, 2-68 Flinders St, PO Box 1379, Townsville, QLD 4810. Inquiries about the macroalgal chapter at [g.diazpulido@uq.edu.au](mailto:g.diazpulido@uq.edu.au).

The diagram illustrates the process of crustose calcareous algae (CCA) recruitment and growth on a coral reef substrate. The main illustration shows a cross-section of a reef with various components:

- Crustose calcareous algae:** Shown as green, yellow, and brown patches on the substrate.
- CO<sub>2</sub> and HCO<sub>3</sub><sup>-</sup>:** A cycle showing CO<sub>2</sub> entering the water and forming HCO<sub>3</sub><sup>-</sup>, which then releases H<sup>+</sup> ions.
- H<sup>+</sup> ions:** Shown as small blue dots, indicating increased acidity.
- Sediments:** Shown as a layer of brown material at the base of the reef.
- Nutrients:** Shown as a layer of brown material at the base of the reef.
- Temperature:** Indicated by a thermometer icon with an upward arrow, showing increased temperature.
- Recruitment:** A circular arrow indicates the removal of coral and fleshy macroalgae by storms, leading to the recruitment of CCA.

Below the main illustration, three smaller diagrams illustrate the effects of environmental changes on CCA recruitment and growth:

- Coral bleaching increases substrate availability:** A diagram showing a thermometer with an upward arrow and a coral skeleton, indicating that bleaching removes the coral cover, making the substrate available for CCA.
- Increased temperature causes changes in species composition and distribution:** A diagram showing a thermometer with an upward arrow and a coral skeleton, indicating that increased temperature leads to coral bleaching and changes in the reef's species composition.
- Removal of coral and fleshy macroalgae by storms increases substrate availability:** A diagram showing a circular arrow and a coral skeleton, indicating that storms remove coral and macroalgae, making the substrate available for CCA.
- More acidic waters can cause dissolution of carbonate and reduced calcification:** A diagram showing a thermometer with an upward arrow and a coral skeleton, indicating that increased temperature leads to more acidic waters, which can dissolve carbonate and reduce calcification.
- Sediments can bury CCA and increased nutrient availability can promote competition with fleshy macroalgae and turf algae:** A diagram showing a thermometer with an upward arrow and a coral skeleton, indicating that sediments can bury CCA and increased nutrient availability can promote competition with fleshy macroalgae and turf algae.

*ASPAB Newsletter*



# V<sup>th</sup> Asian Pacific Phycological Forum

Wellington, New Zealand  
November 10-14, 2008

V<sup>th</sup> Asian Pacific  
Phycological Forum

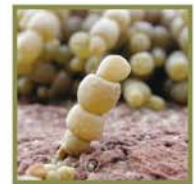
Wellington, New Zealand  
2008



The V<sup>th</sup> APPF will be held in Wellington, New Zealand in November 2008. Wellington is the capital city of New Zealand and home to National Institute of Water and Atmospheric Research (NIWA), Victoria University of Wellington (VUW), and the Museum of New Zealand Te Papa Tongarewa (Te Papa). The APPF in Wellington is being organised through ASPAB (the Australasian Society for Phycology and Aquatic Botany) with both New Zealand and Australian members assisting, and jointly hosted by NIWA and VUW.

## Scheduled mini-symposia:

- Freshwater algae
- Acidification/global climate change
- Invasive/introduced algae
- Algal biogeography and systematics
- Bioactives
- Antarctic/Arctic algae
- Macroalgal ecology
- Applied phycology



## Proposed workshops:

- Algal culture collections
- Consortium of marine algae taxonomy for the South-east Asia region
- Bangiales Group meeting



more information:

<http://www.appf2008.com>

Design: Erasmo Macaya - VUW

# ASPAB Committee

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# **AUSTRALASIAN SOCIETY FOR PHYCOLOGY AND AQUATIC BOTANY**

## **APPLICATION FOR STUDENT TRAVEL GRANT TO ASPAB CONFERENCE**

Student name:

Are you a financial member of ASPAB?

Student Supervisor:

I \_\_\_\_\_ declare that the

\_\_\_\_\_ is a student at

\_\_\_\_\_

Student Address:

Title of presentation:

Cost for attending conference (please attach photocopy of receipt):

(send this form to the ASPAB Conference organizing committee)



# **AUSTRALASIAN SOCIETY FOR PHYCOLOGY AND AQUATIC BOTANY**

## **APPLICATION FOR STUDENT OVERSEAS TRAVEL GRANT**

**Conference, Workshop, Herbarium, Laboratory**

**Student name:**

**Are you a financial member of ASPAB?**

**Student Supervisor:**

I \_\_\_\_\_ declare that the  
\_\_\_\_\_ is a student at  
\_\_\_\_\_

**Signed:**

**Date:**

**Student Address:**

**Outline reasons why this travel grant is being requested (at least 250 words)**

**Title of presentations (Conference, Workshop):**

**Herbarium/Laboratory to be visited:**

**Dates of Conference, Workshop, Visit:**

**Cost of travel** (please attach photocopy of receipt):

Return to, with all accompanying documentation, ASPAB secretary

## MEMBERSHIP and RENEWAL

(For all members and applicants. Please return with membership application or renewal)

**Renewals are due 1 July**

This is a RENEWAL/NEW MEMBERSHIP

*(delete whichever does not apply)*

**Name:** Dr / Ms / Mrs / Mr \_\_\_\_\_

**Affiliation:** \_\_\_\_\_

**Postal Address:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Country:** \_\_\_\_\_ **Postal Code:** \_\_\_\_\_

**Preferred email address:** \_\_\_\_\_

**Tel.:** \_\_\_\_\_ **Fax.:** \_\_\_\_\_

For members from New Zealand, "I agree that my contact details may be used by the Australasian Society for Phycology and Aquatic Botany Committee and New Zealand convener for the purposes of communication with the Australasian Society for Phycology and Aquatic Botany Incorporated".

Signature of Applicant \_\_\_\_\_

Date \_\_\_\_\_

Current membership Fees:

|                | AUSTRALIA<br>(includes GST)<br><b>ABN 86 508 002 420</b> | NEW ZEALAND |
|----------------|----------------------------------------------------------|-------------|
| Full Member    | A\$33                                                    | NZ\$30      |
| Student Member | A\$11                                                    | NZ\$10      |

NZ Members, please send renewals to the NZ Convener, Dr Wendy Nelson.  
All other renewals should be sent to the ASPAB Treasurer, Dr Joanna Jones