# Forum Phycologicum



# Newsletter of the Phycological Society of Southern Africa

Vol. 67 March 2008



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Newsletter of the Phycological Society of Southern Africa

#### **Past President**

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#### From the Editor

Welcome to another edition of *Forum Phycologicum*. After some 18-months, it certainly was good seeing so many of you at the recent PSSA congress held at the Ellingham Resorts, south of Durban in Kwazulu-Natal. Special thanks should go to Wendy Stirk who is proving to be quite proficient at planning such events. Despite the regular blackouts (load shedding) and humidity, I am sure that you will all agree with me that it was a most enjoyable conference.

Continuing with the general format, the first edition of the year is largely devoted to the reports presented at the AGM. These are mostly intended for those who were unable to meet up with us in Durban. Perhaps we'll see you next year down in the Western Cape, where the next conference is being planned. We can certainly promise you some very hot, dry (and possibly windy) weather and very cold seas. At least there will be the regular common denominators: cold refreshments; and warm company.

In addition to the conference reports, there is a very interesting *World Science* article and its follow-up of the *Noah's Ark* seed vault, and an article on the award-winning research helping corals survive climate change and warming oceans by manipulating their symbiotic algae. We have had some new student members join the Society and so I would like to take this opportunity of also introducing them to you in our *Getting to Know* your New Members section.

Until the next issue. Best wishes Sincerely

Gavin



Reports presented at the annual general meeting held at the Ellingham Resort, Rocky Bay, KwaZulu-Natal, South Africa, 17 January 2008

#### 1. President's Report – John J. Bolton

The PSSA is 25 years old, with the first meeting having taken place at the University of the Witwatersrand in January 1983. This is a critical time for the PSSA. All societies have to be continually relevant in order to be successful, and we need a phase of renewal in the PSSA. We have had a very impressive recent history with all the major algal conferences having taken place in South Africa in the last decade or so. We are also starting to carry out the original mandate of being a Southern African society, with our meeting in Maputo in 2006, following previous meetings in Lüderitz and Swakopmund. In addition, we are finally starting to attract more members from around Africa, which is critical to our development in the future. There is an important place for having a group in which all interested in algae can interact. Thanks to Wendy Stirk, the current meeting is a good place to start renewing the society, following the 2005 International Phycological Congress and 2006 meeting with the Society of Aquatic Scientists in Maputo. The latter two meetings were limiting, in that some members (particularly students) found it not possible to attend. We must thus catch up a little. The key to this is membership, and we must all concentrate on a membership drive, particularly among those working with algae who are not members, especially students.

On the positive side, work on algae is spreading. To just quote a couple of examples - seaweeds as abalone feed, diatoms as freshwater quality indicators, use of seaweeds in phylogeography studies by marine molecular biologists – there are many people working with algae in the region who may not primarily think of themselves as phycologists. It is important, I think, for the PSSA to provide a forum for anyone with an interest in algae to interact.

So this is an exciting time in that the number of groups working with algae in South Africa and the



region is increasing. The previous President, Grant Pitcher, used to summarise in this address the recent work of all the groups working with algae. When I tried this for this report, I realized that it is no longer a simple task. There are many more relevant groups working in the region than there were a few short years ago. People who have links with the society are spreading and setting up their own groups, such as AJ Smit (UKZN), Joseph Wakibia (Joma Kenyatta University, Kenya), Lineekela Kandjengo (UNAM, Namibia). The society needs to grow with its members.

All societies are kept going by the interest of their members. The Newsletter has had a high quality of production recently, thanks to Gavin Maneveldt. The rest of us need to do our bit by providing regular contributions. We need to discuss how we can best use Gavin's abilities and enthusiasm to make the Newsletter a more important tool to spread information between phycologists in the region.

Phycologists tend to be generalists. We can't all be experts on everything. This emphasizes to me the need for a strong society where we can discuss all the different aspects of algal science, and interact to produce synergies which can help all our research. The 'synergy motto' of 1+1 = 3 is always worth bearing in mind. It was very evident to me when attending the European Phycological Congress in Oviedo, Spain in July 2007, that more and more papers have many authors. Science is becoming much more of a collaborative exercise than it was 25 years ago. If society members can use the PSSA to help to produce new synergies we can play an even bigger role in the next 25 years as in the first quarter century.

### 2. Secretary Treasurer's Report – Mark Rothman

The Society has a Money Market Account that is held at First National Bank. Money Market Accounts have a basic monthly charge, a cash handling fee and have higher interest rates than conventional current accounts. There is a cheque book linked to the account for convenient handling of the account.

With the election of the new committee at the last PSSA congress held in Maputo in 2006 and me taking over as

Secretary/Treasurer from Wendy Stirk, the account had to be transferred to Rondebosch, previously held at Pietermaritzburg. An exercise that was easier said than done. It took about 6 months and three trips to the bank for all the proper documents to be signed and the account to be transferred. As before, two signatories are need (currently John Bolton and Mark Rothman), although withdrawals or cheques only require one of the two's signatures.

The following financial report (see next page) is for the period 4 May 2006 till 4 January 2008. The Society had an opening balance of R15,366.13. The main expenses incurred during this period are printing costs, prize money, and conference costs. Printing and postage costs for the 64-66 issues are not included in this report. All income and expenses are not finalised so here we report on projected figures. Projected capital gain for period 4 May 2006 - 4 January 2008 is R7,534.94. This is largely due to a projected profit of between R6,300.00 and R6,500.00. Taurus gave the Society a sponsorship of R2,500.00, for which we are very grateful. Other significant income streams were the annual subscriptions (R1,400.00) and interest gained on a positive bank balance (R 2,052.24).

Student prizes in the past have been sponsored by the South African Seaweed Concessionaires' Association but this association has been dormant for the last couple of years. However, they (the association) are in the process of being resurrected with the establishment of a seaweed working group which started early in 2007. The new association does not have a name yet, but they are busy drawing up a new constitution. At the last seaweed working group meeting I spoke to the association's secretary (Amanda Begg) who indicated that the association would continue with the support of the PSSA in the form of sponsoring student prize money.

After this meeting John Bolton (Past President) will be handing the reigns over to Eileen Campbell (President-Elect) and we want to thank John for his availability and leadership. Election of the 2009 committee will be preceded by nominations and then an election. Nominations as well as voting will, this time, be done via e-mail and the new committee will be announced at the next PSSA meeting in January 2009. Closer to the end of this year you should receive an e-mail from me calling for nominations.

It has been a pleasure serving as Secretary/Treasurer. Thank you!



# PSSA BALANCE SHEET 4th May 2006 - 4th January 2008 Money Market Account (FNB)

	Credit	Debit	Balance
Balance brought forward			R 15,366.13
Subscriptions (2005-2008)	R 1,400.00		R 16,766.13
Printing (Forum Phycologicum)		R 2,724.53	R 14,041.60
Taurus Sponsership	R 2,500.00		R 16,541.60
SASCA prise money			R 16,541.60
Projected Profit from Conference	R 6,500.00		R 23,041.60
Student Prises		R 1,600.00	R 21,441.60
			R 21,441.60
Interest	R 2,052.24		R 23,493.84
Charges		R 592.77	R 22,901.07
TOTAL ASSETS (04 January 2008)			R 22,901.07
Projected capital gain for period 4 May 2006 - 4 January 2008			R 7,534.94

#### Not included in Report:

1) Printing cost for Forum Phycologicum for issues 64-66

2) Postage cost for Forum Phycologicum issues 64-66

# 3. Membership Secretary's Report – AJ Smit

I report here on figures for 2006 and 2007. The membership database (a Word document) has stagnated for about two years prior to this, but it has recently been revived and reformatted into vcard and Excel formats. A breakdown of the membership fees generated during 2006 and 2007 follows:

*Life members* – PSSA currently has 18 members in this category.

*Corporate members (R500 per annum)* – The Society had one active corporate member in 2007.

Ordinary members (R50 per annum) – The membership database contains 36 ordinary members, eight of whom were active in 2007 (R400), and four in 2006 (R200). 13 members in this category had not paid for > 3 years up until December 2007 and have consequently been excluded from the database.

Student members (R30 per annum) – 21 members are this category. The Society received fees from 9 students in 2007 (R270) and only one person in 2006 (R30). Three students had not paid for > 3 years up until December 2007 and were excluded from the database.

Memberships therefore generated R1400 during the two-year period reported here. One member officially terminated his/her membership in 2006.

#### 4. Newsletter Editor's Report – Gavin W. Maneveldt

Thank you to all of you who have contributed so generously to the success of the PSSA newsletter. Despite regular contributions from only a very small, committed sector of the society, we still have been able to produce three issues per year (March, June/July and December). While general submissions from ordinary members pertaining to News and Reviews are regularly received, contributions from our student members are still sorely lacking. Since the Mozambique conference in June of 2006, we have received only one student contribution compared with two (December 2004 - June 2005) and six (December 2003 – June 2004) for the previous periods.



In my previous report, I highlighted the fact that "we may need to discuss other ways of encouraging students to contribute". One suggestion that came from discussions at the Mozambique conference was to change the name of the newsletter to make it resemble a society journal. The argument was that this may encourage student participation as it would be seen as something more concrete in their CVs. Now that I think of it, either we were aiming too high, or perhaps we are just being too impatient, expecting that things would pick up within the course of only one-and-a-half years. None-the-less, what ever the case may be, I am sure that those of vou who have and will continue to contribute, will appreciate the fact that we've changed the look of the newsletter to that of a society journal.

As in my previous report, I again take this opportunity of reminding you that the newsletters (in pdf format) and all the articles therein are available for download from the society's website (http://www.bcb.uwc.ac.za/pssa/). This is especially useful since all images are visible in their original colour. I would also like to draw your attention to missing and/or inaccurate membership details on the website. Many members have no doubt left to work elsewhere, broadened their research interests, and changed portfolios, and so on. If you are aware of such members (perhaps you are such a member), please have them contact the membership secretary (AJ Smit - smitaj@ukzn.ac.za) so that we can capture your new personal details. I am receiving an increasing number of returns via the post simply because we have outdated membership records. In this regard, I urge you all to visit the website on occasion to check for accuracy and ongoing additions. Once again, thank you to all who have contributed to the success of the newsletter.

# **The Annual Conference**

### **Summary and Prize Winners**

The 23<sup>rd</sup> PSSA Congress was held from 15<sup>th</sup> - 18<sup>th</sup> January 2008 at Ellingham Resorts situated at Rocky Bay on the KwaZulu-Natal south coast. The congress was well attended with 41 delegates of which 21 were students. The congress kicked off with a braai on Tuesday evening and presentations



A view of the Ellingham Resort.



PSSA 2008 participants.



A fieldtrip down to the Ellingham Resort rocky shore was planned for the Wednesday afternoon.

began on Wednesday morning. The guest speaker, Dr Nair Yokoya from the Institute of Botany, Sao



Paulo, Brazil presented a very interesting talk discussing the seaweed resources of Brazil and then presented her own results on the effects of plant hormones on the growth and morphogenesis of certain commercially important Rhodophyta species in laboratory culture. The remainder of the programme was divided into six diverse sessions ranging from Physiology and Ultrastructure, Biodiversity and Microalgal Communities, Diatoms, Taxonomy and two Mariculture sessions as well as a Poster session. In total, 29 talks (15 student talks) and 11 posters (5 student posters) were presented. On Wednesday afternoon, John Bolton and Rob Anderson ran a field trip where many seaweeds were collected and identified from the rocky shore at Rocky Bay. The AGM was held late on Thursday afternoon and the congress closed with a Dinner and Prize-Giving on Thursday evening.

The Society is most grateful to Wendy for organising such a successful event. We would also very much like to thank Taurus Products (Pty) Ltd and the National Research Foundation for funding PSSA 2008.

The quality of all the presentations was very high but the winners were:

### Best student oral paper:

Trevor Bell and co-authors - A cladistic study of Nephroselmis Stein.



Tinus Sonnekus received the SASCA ward for the best poster contribution to the seaweed industry.



Trevor Bell received the prize for the best PSSA student oral presentation.



Sabine Hoppe-Speer received the prize for the best PSSA student poster presentation.



Deborah Robertson-Andersson received the SASCA ward for the best oral contribution to the seaweed industry.



#### Best student poster paper:

Sabine Hoppe-Speer and co-authors - *Diatom* community structure within a temporarily openclosed estuary within the Tsitsikamma Estuary.

### SASCA award for the best oral paper:

Debborah Robertson-Andersson and co-authors - A pilot scale integrated seaweed (<u>Ulva lactuca</u>) and abalone (<u>Haliotis midae</u>) recirculation system.

### SASCA award for the best poster:

Tinus Sonnekus and co-authors - *Culturing of* <u>Hypnea rosea</u> as a food source for commercially grown abalone, <u>Haliotis midae</u>, on the Eastern Cape coast.

I will remember the congress for the many power blackouts, extremely hot and humid weather and the stimulating conversations that were not necessarily all about Phycology.

#### Wendy Stirk

Res. Centre for Plant Growth and Development, University of KwaZulu-Natal, Pietermaritzburg

### **World Science**

### 1. Plans for "Noah's Ark" seed vault unveiled

### Feb. 9, 2007

Courtesy: Burness Communications and World Science

## Source: <u>http://www.world-</u> science.net/othernews/070209\_seed-vault.htm

Architectural plans for a "Doomsday" seed vault, to protect the world's seeds for posterity, have been revealed. The **Svalbard International Seed Vault**, to be located on the remote Arctic archipelago of Svalbard, would house in perpetuity seed samples of every major food crop, said officials of the Global Crop Diversity Trust (GCDT), a Romebased foundation devoted to protecting crop genetic diversity.

The designers plan the vault as a safeguard against the slow devastation of global warming and loss of biodiversity, which is killing off less common strains of food crops and leaving others vulnerable. The "fail-safe" vault will "gleam like a gem in the midnight sun," a statement from the foundation said. That glint would signal priceless treasure within. The design will accommodate even worstcase scenarios of global warming in two main ways, according to the foundation. For one, the vault will be high above any possible rise in sea level caused by global warming: 130m (142 yards) above current sea level, ensuring it won't be flooded. This puts it well above even a 61m rise that could accompany an unlikely total meltdown of Antarctica.

But it will also be deep enough to guard against temperature changes, officials said. "Even climate change over the next 200 years will not



An artist's impression of the Svalbard Global Seed Vault (Courtesy GCDT).



significantly affect" the temperature in the frozen ground, said project manager Magnus Bredeli Tveiten of Statsbygg, the Norwegian government's Directorate of Public Construction and Property. A 120m entry tunnel will penetrate through the ground, opening to two large chambers capable of holding three million seed samples.

Construction is slated to begin in March 2007 and to be completed in September 2007. The vault is to open in late winter (Northern Hemisphere) 2008. Officials of the Trust said they're finalizing an agreement with the Royal Ministry of Agriculture and Food of Norway and the Nordic Gene Bank to provide for the long-term funding, management and operation.

# 2. "Noah's Ark" seed vault opens

### Feb. 26, 2008

Courtesy: Global Crop Diversity Trust and World Science Source: <u>http://www.world-</u> science.net/othernews/080226 vault

A vault designed to protect vanishing seed varieties for future generations opened Feb. 26 on a remote Arctic island. The Svalbard Global Seed Vault, a project of the Norwegian government, received inaugural shipments of 100 million seeds that originated in over 100 countries. With deposits ranging from unique varieties of African and Asian food staples such as maize, rice, wheat, cowpea, and sorghum to European and South Amercan varieties of eggplant, lettuce, barley, and potato, the first deposits represent what officials called the most comprehensive and diverse collection of food crop seeds held anywhere.

At the opening ceremony, Norwegian Prime Minister Jens Stoltenberg unlocked the chamber and, with African Nobel Peace Prize-winning environmentalist Wangari Maathai, placed the first seeds inside. European Commission President José Manuel Barroso along with dignitaries and agriculture experts from around the globe deposited additional seeds. Built near the village of Longyearbyen on the island of Spitsbergen, Norway, the vault at its inception contains 268,000 distinct seed samples – each from a different farm or field. Each sample may contain hundreds of seeds or more. In all, the day's shipments weighed some 10 tonnes.

The vault is part of what its proponents call an unprecedented effort to protect the planet's rapidly diminishing biodiversity. The genetic diversity of crops is essential for food production, yet scientists say it's being lost. The vault, dug deep into the frozen rock of an Arctic mountain, is meant to secure for centuries, or longer, hundreds of millions of seeds representing every important crop variety available in the world today. As well as protecting against the daily loss of diversity, the vault is also seen as a last-resort bulwark for restarting agricultural production at the regional or global level in the wake of a natural or man-made disaster. Contingencies for climate change have been worked into the plan. Even in the worst-case scenarios of global warming, the vault rooms will remain naturally frozen for up to 200 years.

"With climate change and other forces threatening the diversity of life that sustains our planet, Norway is proud to be playing a central role in creating a facility capable of protecting what are not just seeds, but the fundamental building blocks of human civilization," said Norway's Prime Minister Jens Stolten-berg.



The seed vault's entrance juts out from a mountainside (Credit: Mari Tefre - Global Crop Diversity Trust).



### **Featured Article**

Five marine experts based in the United States, China, France, Australia and Canada are recipients of the 2008 Pew Fellowship in Marine Conservation, the preeminent fellowship in support of ocean conservation awarded by the Pew Institute for Ocean Science. One of these recipients is Associate Professor Andrew Baker from the Rosenstiel School of Marine & Atmospheric Science at the University of Miami in Florida, USA.

# Helping corals survive climate change and warming oceans by manipulating their symbiotic algae

Feb. 5, 2008

Courtesy: Pew Institute for Ocean Science (http://www.pewoceanscience.org/fellows/2008/)



Corals are simple animals that live within a narrow temperature range. They depend on partnerships with microscopic algae (called "zooxanthellae") belonging to the Dinophyta to help them thrive

http://cookislands.bishopmuseum.org/).



On October 25, 2005 NOAA reported that a major coral bleaching event was underway in the Caribbean that eventually resulted in significant coral death in much of the region. The bleaching was centered in the waters adjacent to the U.S. Virgin Islands. Above is the NOAA satellite image of the regions of high thermal stress for that period, taken from NOAA's Degree Heating Week (DHW) satellite-based product that accumulates high temperature events. Each DHW represents one week of temperatures that are 1°C above the maximum highest monthly average. Accumulated over three months, DHWs above 4 are virtually always accompanied by considerable bleaching. Levels above 8 are now known to present increased coral mortality and inability to recover (Courtesy: NOAA – <a href="http://www.noaa.gov/">http://www.noaa.gov/</a>).



and build reefs in shallow tropical seas. These symbiotic algae live inside the corals and provide them with energy from photosynthesis, allowing corals to build their slow-growing limestone skeletons. However, rising temperatures caused by global warming disrupts this partnership, resulting in mass "bleaching" events, in which corals lose their colourful algae and often die.

Dr. Andrew Baker's interests focus on these algal partners, which genetic studies have shown to be very diverse. His research has found that many important coral species are flexible in the types of algae they host, and that some of these algae are more heat-tolerant than others. Corals with heattolerant types of algae are more resistant to bleaching caused by rising temperatures. However, although many coral species are able to form partnerships with these heat-tolerant algae, relatively few have enough at any one time to prevent them from bleaching and dying when temperatures rise.

With his Pew Fellowship, Andrew Baker plans to develop practical techniques to boost the natural abundance of heat-tolerant algae inside reef corals maintained in the laboratory. He will apply these methods to the field, with the aim of building an internal "safety net" inside select corals that will prevent their death in the event of bleaching. His emphasis will be on trying to protecting the largest and oldest colonies on reefs, since these colonies are responsible for most of the sexual reproduction on reefs, and also provide most of the threedimensional habitat. By applying these techniques to corals in the field, Andrew Baker hopes to produce local populations of heat tolerant corals ("species survivorship networks") that will help prevent complete loss of coral cover during a major bleaching event. In addition, Dr. Baker plans to use these methods to help coral nurseries raise local stocks of heat-tolerant corals that can be used to reseed reefs devastated by coral bleaching.

By strengthening a natural adaptive mechanism that helps corals survive environmental change, this project represents a unique attempt to directly alleviate the impacts of climate change on reefs, while also producing genetically native stocks of resilient corals that can be used for local restoration attempts.

Andrew Baker's breakthrough discovery that coral bleaching might help corals survive climate change by enabling them to rapidly swap out their algae was hailed by Discover magazine as one of the "Top 100 Science Stories of 2001". His follow-up work, testing how corals respond to climate change around the world, has resulted in an archived collection of more than 12,000 samples. From these archives, Andrew Baker and his team of graduate student researchers extract and purify DNA in a quest to pinpoint the specific genetic factors that enable certain corals to be more bleaching-resistant. In addition, Andrew Baker's team runs controlled climate change experiments on live corals in an outdoor laboratory to understand the physiological responses resulting from different genetics. Dr Baker's Pew Fellowship builds on these findings and takes the logical next step towards applying this research and taking direct action to mitigate the effects of climate change.

# **Getting to Know Your New Members**

### New Members as of 2007

Elizabeth van der Merwe (2538521@uwc.ac.za)



Elizabeth is completing an MSc degree in the Dept. **Biodiversity** and of Conservation Biology under the supervision of Dr. Gavin W. Maneveldt from the University of the Western Cape. Her research focus is on best management practices for improved growth of the abalone Haliotis midae

Linnaeus on a South African abalone farm that utilizes mostly wild seaweed as feed for their abalone. Elizabeth's hobbies are broad-ranging and include "people, animals, plants and books". Everything new and unknown attracts her attention.



#### **Trevor Bell**

(bell@gecko.biol.wits.ac.za)

Trevor is completing an MSc degree in the School Animal, Plant & of Environmental Sciences under the joint supervision of Dr Stuart Sym and Dr Glynis Goodman-Cron from University the of the Witwatersrand. His research on molecular focus is phycology. Trevor's hob-



Trevor Bell

bies include listening to classical and early music and watching art films. He especially loves reading works of non-fiction.

### **Tamson Francis**

(2204509@uwc.ac.za / tamsonfrancis@yahoo.com)

Tamson has just graduated with an MSc degree from the Dept. of Biodiversity and Conservation Biology at the University of the Western Cape, under the supervision of Dr. Gavin W. Maneveldt. Her research focus is on the effects of different kelp feeding regimes and of export protocols on the growth of the



abalone *Haliotis midae* Linnaeus. Tamson loves the marine science field and especially enjoys field trips to the beach. Her other hobbies include camping, fishing, swimming and hiking.

# **Conference Countdown**

PSSA 2009 will be hosted by the University of the Western Cape and is planned for the Western Cape Province, South Africa. Updates on the conference will follow in future editions of the newsletter and on the website.

# **Calendar of Events**

### **Upcoming Conferences**

- Spring meeting of the Society for General Microbiology (UK) "Cyanobacteria: who they are and what they do?", Edinburgh, Scotland, 2-3 April 2008. <u>http://www.sgm.ac.uk/</u> meetings/MTGPAGES/Edi08Se.cfm
- Ectocarpus 2008. Dunstaffnage Marine Laboratory, Oban, Scotland, 4-8 June 2008. <u>http://www.ccap.ac.uk/Conferences2008.htm</u>
- 3<sup>rd</sup> Congress of the International Society for Applied Phycology and the 11<sup>th</sup> International Conference on Applied Phycology. Galway, Ireland, 21-27 June 2008. <u>http://www.conference.ie/Conferences/index.a</u> <u>sp?Conference=41</u>
- South African Marine Science Symposium (SAMSS) 2008. Cape Town, RSA, 30 June - 3 July 2008. <u>http://www.samss2008.uct.ac.za/</u>
- 5. 20<sup>th</sup> International Diatom Symposium, Dubrovnik, Croatia, 7-13 September 2008. <u>http://www.imp-du.com/ids2008</u>
- 5<sup>th</sup> Asian Pacific Phycological Forum (APPF). Wellington, New Zealand, 10-14 November 2008. <u>http://www.appf2008.com</u>
- International Phycological Congress (IPC) 2009. Tokyo, Japan, 2-8 August 2009. See -<u>http://www.intphycsoc.org/</u>





