



The Phycological Society of Southern Africa

**Newsletter
No. 50
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Table of Contents

	Page No.
From the Editor	3
Attention All:	4-5
1. IPC logo	4
2. Student Submissions and Prizes	4
3. New Website	4-5
4. Contact Details and Research Areas	5
Featured Article:	
<i>South Africa's marine flora depicted: A national initiative</i>	6-8
Popular Student Articles:	9-12
1. <i>A simple and rapid scanning electron microscope preparative technique for delicate dinoflagellates</i> - Lizeth Botes	9-10
2. <i>The Brown Stangler</i> – Deborah Robertson-Andersson	11-12
Conference Countdown	13
Calendar of Events for 2002/3	13-14
New on the PSSA website	14

From the Editor

The second newsletter of the year has two wonderful new additions. Firstly, there are the popular student articles making for some really interesting reading. A special thanks to Lizeth Botes and Debby Robertson-Andersson for taking the plunge and sending their articles. I am confident that theirs signify a wonderful trend. Secondly, a “*New on the PSSA website*” segment which will keep you all informed of any new developments on the website.

As you may well be aware, I am trying to incorporate as many relevant images as possible into the newsletter. Of course, the quality of these images is limited since the newsletter is produced as a black and white photocopied production. However, for those of you who would like to see these images in their original colour, you may download the newsletter from the website.

A special thanks goes to all those who have contributed to this issue of the newsletter; without your contributions it would be impossible to produce anything. Please feel free to forward any submissions (esp. student articles) for future issues of the newsletter directly on to me or to your regional collators (see below).

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Sincerely

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PSSA website URL: <http://www.botany.uwc.ac.za/pssa/>

Attention All

1. IPC logo

The deadline for submissions for logos for the upcoming IPC congress in Durban in 2005 is upon us. Stuart has had only two submissions! If you would still like to contribute, feel free to contact him directly at: stuart@gecko.biol.wits.ac.za (Tel: (+27-11) 717-6431; Fax: (+27-11) 403-1429).

The deadline for submissions is the end July 2002.

2. Student Submissions and Prizes

At the general meeting held earlier this year, it was decided that to promote written submissions for the newsletter, R400 would be awarded for the best student article of the year. This prize will be awarded at the following general meeting to be held at the 2003 conference and will become an annual event.

The response has however been very poor! A special thanks to Lizeth Botes and Debby Robertson-Andersson (and their supervisors) for their submissions. Supervisors, please encourage your students to submit articles for this segment.

Guidelines: See Newsletter No. 49, March 2002.

3. New Website

The new website is up and running. The *URL* is: <http://www.botany.uwc.ac.za/pssa/>. A special thanks goes to all who contributed to its construction and especially those members who responded to the request to update their membership details and research interests. Please check the site regularly for updates and comment on anything you find lacking, incorrect, inappropriate or simply just stale.

There are also a number of segments on the website that you need to keep an eye on regularly. They are all navigational links so should be easy to find. Here they are:

- **The Annual Conference** – For regular updates on the annual PSSA conference.
- **The Newsletter** – For those who wish to have the original colour version, the newsletter will always be available online.
- **Featured and Student articles** – This segment will contain the featured and student articles and will be updated soon after you've received the Newsletter. These will contain colour images if any.
- **Conferences, Symposia and Workshops** – For upcoming meetings of Phycological interest, just follow the "*Calendar of Events*" navigational link.
- **Bursaries, Postdocs, and Employment** – Keep an eye on this section for all "*Notices*" related to money issues.

4. Contact Details and Research Areas

Please check your details on the new website for omissions or incorrect details. Please remember that we would like to know your specific research areas and not that you are just simply interested in *Phycology*.

Featured Article

South Africa's marine flora depicted: A national initiative

The Old Mutual World Environment Day poster project of the Botanical Society, in association with the National Botanical Institute, was brought to a close when the final poster in the series, 'Sea Plants', was successfully launched in Cape Town and Durban during World Environment Week 2002. The acclaimed educational poster / workbook project, depicting the different biomes of South Africa, has seen colourful and highly informative posters with accompanying workbooks launched on World Environment Day for the past 10 years.

To date the Botanical Society has published posters on the biodiversity of Cape Dunes (1993), Wetlands (1994), Summer Rain Karoo (1995), Bushveld (1996), Fynbos (1997), Forests (1998), Namaqualand (1999), Grasslands (2000) and Valley Thicket (2001). With all the important land based biomes having been covered, the final poster and workbook on Sea Plants (better known as seaweeds) found in the inter-tidal zone of South Africa's 3000km long coastline was launched on 5 June 2002. This year posters and workbooks have been distributed mainly to schools along the coast of South Africa for use in their environmental education programmes. It is estimated that over six million learners have been reached over the years and teachers have found the material to be a valuable resource for the outcomes based curriculum.

The sponsor of the project, Old Mutual, wanted to complete the series of biome posters and workbooks with the final one recognising the importance of the marine and coastal environment. The Botanical Society commissioned well-known botanical artist Elbe Joubert to paint the poster. It represents a selection of sea plants from the warmer waters of the Indian Ocean on the East Coast (right-hand side of the poster) and those from the cold waters of the Atlantic Ocean on the West Coast (left-hand side of the poster). The final result is a

fascinating collage of sea plants and associated organisms in a natural setting. Over 130 organisms are depicted in the poster and the workbook provides a key to these organisms. In addition the workbook provides a set of lessons for learners in the 'Foundation Phase' of the outcomes based education curriculum.

A number of workshops for educators and learners were held simultaneously with the launch in World Environment Week, notably at the Two Oceans Aquarium in Cape Town and at Sea World in Durban. To date over 500 educators have attended these workshops where they have been instructed in ways to gain optimal value from the Sea Plants posters and workbooks.

A special mention should go to the Phycological Society of Southern Africa whose Western Cape members (Rob Anderson, John Bolton and Gavin Maneveldt) offered their valuable time freely to form part of the education committee for this year's poster project.

Dave J. McDonald
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For those interested, a colour version of the poster can be viewed on the BOTSOC website at <http://www.botanicalsociety.org.za/>. Alternatively, visit the PSSA website ("Newsletter Link") for an A4-size colour copy of the poster. If you are interested in obtaining a free copy of the poster itself, the BOTSOC website has a list of national distribution points.



Popular Student Articles

A simple and rapid scanning electron microscope preparative technique for delicate dinoflagellates

Lizeth Botes

Marine Biological Institute, University of Cape Town

Considerable confusion exists with regard to the identity of many delicate dinoflagellate species. Light microscopy is routinely used to investigate these species but at this level of resolution certain morphological features are difficult, or even impossible, to observe. This can result in the misidentification of dinoflagellates at the genus level, thereby necessitating the use of scanning electron microscopy (SEM). Attention has recently been focused on constructing a more satisfactory taxonomic system for delicate dinoflagellate species by combining results obtained from light microscopy, SEM, well as pigment and phylogenetic analysis. Unfortunately, these species lack thick cellulosic plates within their thecal vesicles, which render them highly susceptible to distortion during standard SEM techniques which involve centrifugation, filtration, fixation, dehydration and critical point drying (CPD). By using poly-L-lysine in combination with hexamethyldisilazane (HMDS), it is possible to overcome the negative effects of centrifugation and filtration. It is also possible to overcome the negative effects of the vigorous solvent exchanges, and temperature and solvent changes during CPD. Poly-L-lysine has already effectively been used to adhere biological material (eg human red blood cells, mouse leukemic cells, dinoflagellates) to glass coverslips. The adhesion of biological material to the surface of poly-L-lysine coated coverslips results from the attraction between the negatively charged surface of the fixed biological material and the positively charged surface of the coverslip. HMDS, which has a reduced surface tension when evaporating, has effectively been used to dry soft insect tissues, rat hepatic endothelial cells and the cilia of rat trachea. The technique (described below) is inexpensive, less time consuming, simple and needs limited expertise.

The Brown Strangler

Deborah V. Robertson-Andersson

Botany Department, University of Cape Town

Harvested cells in culture medium are fixed with 2% osmium tetroxide (OsO₄), which is made up with filtered seawater. While the cells are being fixed, glass coverslips (10mm in diameter) should be washed with acetone, placed on a heating block and coated with poly-L-lysine (Molecular Weight 70, 000 – 150, 000). To ensure that the coverslips are well coated, poly-L-lysine should be applied repeatedly. Once the coverslips have cooled, they should be mounted onto SEM stubs with silver paint. The 1% solution of fixed cells and OsO₄ is applied to the coverslips and left for ~ 30 minutes to allow the now negatively charged cells to adhere to the now positively charged coverslips. Cells are washed by submerging the stubs for 10 minutes in a 1:1 solution of distilled water and filtered seawater, followed by a second wash in distilled water (10 min). The stubs are then taken through a graded ethanol series (30%, 50%, 70%, 80%, 90%, 95% and 3X in 100% - 10 min. at each step). Following removal from the 100% ethanol, a few drops of HMDS are immediately dispensed onto the coverslips. If necessary, more HMDS could be added to ensure a well-dried sample. The stubs are then sputter coated with gold-palladium (60:40) and viewed with a SEM. Good micrographs were obtained, using this technique, with features such as the apical groove, cingulum displacement, flagella, thecal plates and scales clearly visible (Figs 1 – 2).

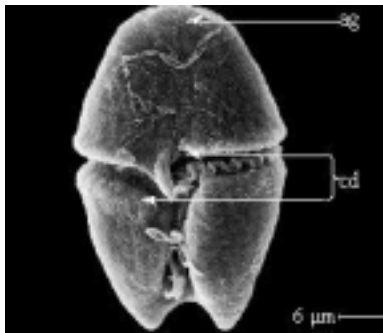


Fig. 1 *Akashiwo sanguinea*
ag: apical groove, cd: cingulum displacement

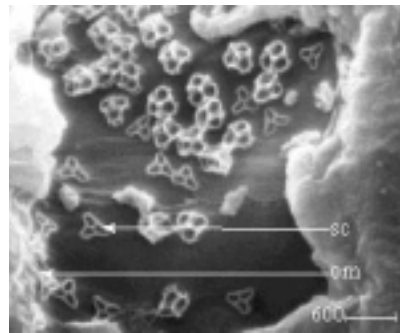


Fig. 2 *Heterocapsa* sp.
sc: scale, om: outer membrane displacement

It's out there. It's every *Ulva* thalli's worst nightmare. Innocently occurring as a few spots on the holdfast section, it waits, patiently. It's the Brown Strangler! It's *Myrionema strangulans*.

Myrionema strangulans occurs naturally in wild populations of *U. lactuca*, in False Bay. Here it persists as spots, numbering between 5 and 10 on the holdfast section. The spots are brown regular discs, 1 – 3 mm in diameter. It was first recorded on an abalone farm in Gansbaai after it had decimated entire *Ulva* culture tanks. This was the first record for South Africa, and was identified by Dr. Herre Stegenga. It appears to persist on *Ulva* throughout the year. There is however a slight seasonal pattern to infection rates. Infestation of *Ulva* in culture was first noted in late spring and by late summer culture populations were decimated. Infestations continued throughout autumn, however the effects of the infection were not as severe.

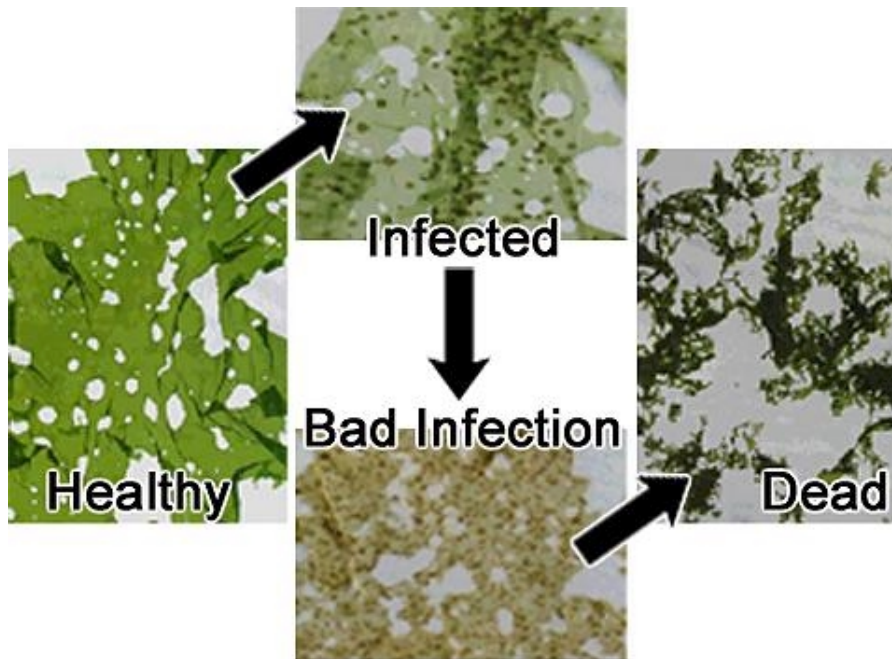
Typical effects on *Ulva* thalli are that the *M. strangulans* spots increase in number and move over the entire thallus surface. The *Ulva* thallus becomes thinner and yellow in colour. Then, due to some unknown process (as *M. strangulans* is an epiphyte with no endophytic filaments), the host thallus breaks up into pieces of between 1 - 3 cm diameter. Once this has happened the culture populations never recover.

Infestation is particularly prevalent in culture tanks that are carbon limited due to low water exchange rates or in tanks that have a high pH. Pulse fertilization and improved water exchange rates (12 - 20 volume exchanges per day) appear to control or minimize the infections.

Myrionema strangulans can be easily identified. It is discoid and is

epiphytic on *Ulva* and *Enteromorpha* (according to international literature). According to descriptions, its disc colour varies from light greenish brown to medium brown to dark brown, although I have only seen the latter coloured discs epiphytic on our *Ulva* specimens. It consists of a monostromatic basal layer, with adjacent subdichotomous radiating filaments. The older cells have short attachment pegs that adhere to the host surface. The inner cells are between 8 - 14 µm long, 5 - 8 µm broad and 4 - 8 µm high while the marginal cells are more elongate. Erect assimilatory filaments form a shallow even dome.

It is listed as being widespread in temperate seas. Its infection and subsequent decimation of *Ulva* in culture means that anyone cultivating *Ulva* needs to be able to recognize and treat infestations rapidly before they become too severe. It's out there, so beware!



Conference Countdown

PSSA 2003 will be hosted by the Department of Botany at the University of Port Elizabeth. Please keep an eye on the new website for the conference updates.

- <http://www.botany.uwc.ac.za/pssa/conference/> -

Calendar of Events for 2002

A. Upcoming Conferences

1. 56th Annual meeting of the Phycological Society of America, 3-8 August 2002. Website: <http://www.botany2002.org/>.
2. 15th International Conference on Electron Microscopy, 1-6 September 2002. Website: <http://www.icem15.com/>.
3. 6th Conference of the Aquaculture Association of Southern Africa, 11 & 12 September 2002. Website: <http://www.sun.sc.za/aasa/>.
4. Effects of Fishing Activities on Benthic Habitats: Linking Geology, Biology, Socioeconomics, and Management, 12-14 November 2002. Website: <http://walrus.wr.usgs.gov/bh2002/>.
5. The Colour of Ocean Data: an international symposium on oceanographic data management, 25-27 November 2002. Website: <http://www.vliz.be/En/Activ/Cod/cod.htm>.
6. The Pacem in Maribus Conference (XXX) 2002 (*Peace in the Ocean*), 8-14 December. Website: <http://www.ioi.uwc.ac.za/PIM2002/>.
7. Marine Science and Technology for Environmental Sustainability, 17-18 December 2002. Website: <http://www.ncl.ac.uk/ensus/>.
8. Sixth International Temperate Reef Symposium, 13-17 January 2003. Website: <http://www.zool.canterbury.ac.nz/conference/>.
9. Oceanology International 2003, 4-6 June 2003. Website: <http://www.oiamericas.com/english.asp>.

B. Upcoming Workshops

1. International Workshop and Training Course on Microalgal Biotechnology, 23-29 September 2002. Websites:


<http://www.scsio.ac.cn/news/algae/index.html>

<http://algae.126.com>

<http://algae.onchina.com>

New on the PSSA Website

The following segments are either new or exciting additions to the website. If you haven't noticed them already, here they are.

1. *The PSSA History* – follow the “About” navigational link.
2. *Newsletter* – in MS Word format with all its colour images
3. *Featured Articles* – current news and popular articles from outside and within the Society.
4. *Fun Stuff* – Great games for kids and adults alike. Our very own play zone. When you have some time, go on, test your skill.
5. Look out for the  image. It is your indication of what's new on the “Links” page. There are lots of great new sites of interest to phycologists here!