PHYCOLOGICAL SOCIETY OF SOUTHERN AFRICA

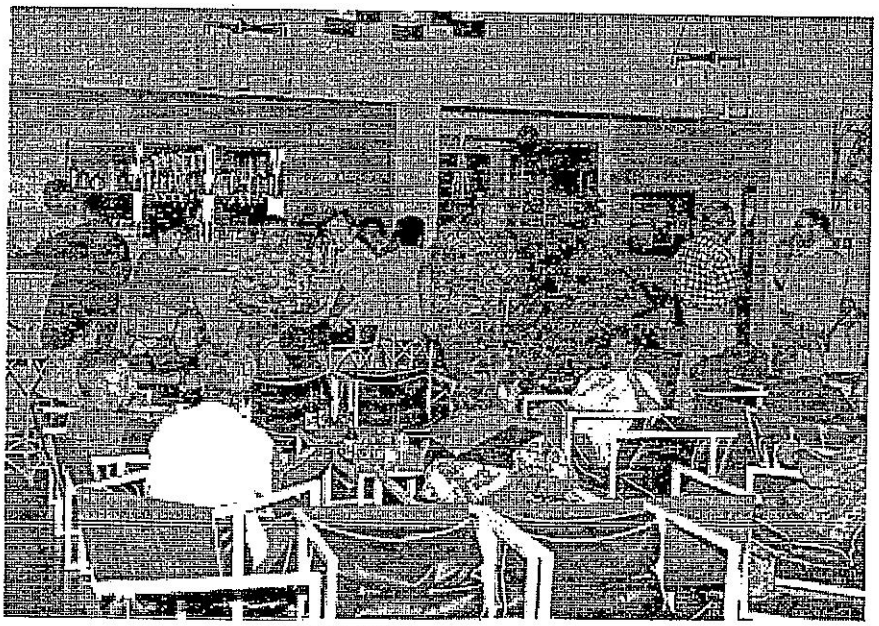
FIKOLOGIESE VERENIGING VAN SUIDELIKE AFRIKA

NEWSLETTER
NUUSBRIEF

No. 40
May 1996

THE BOARD OF THE PHYCOLOGICAL SOCIETY OF SOUTHERN AFRICA

TABLE OF CONTENTS



13TH PSSA CONGRESS

FROM THE EDITOR

Dear PSSA members

I'm sure everyone is well into the new year after a thoroughly enjoyable PSSA congress in January. On behalf of the PSSA members I would like to thank the organizing committee for a great time. This was the 13th Congress but was certainly not an unlucky event for anyone, except maybe the losing Action cricket side. I have included a brief summary from the report back on the field trip to the Bot River estuary (page 4). The UPE crowd is organizing the next congress and a number of different venues are being considered (page 10). Included in this newsletter is the first circular and reply form for the 14 th PSSA congress.

Dr Grant Pitcher and Prof Guy Bate are thanked for their articles. Contributions for the next issue can be sent to the address below.

Regards
Janine

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Minutes of the 13th Annual General Meeting Held at Meerensee, Western Cape, Tuesday 22 January 1996.

1. Welcome: The President, Dr R J Anderson, welcomed everyone present and declared the meeting open at 17h10.

2. Apologies: The meeting was well attended with some 40 delegates being present. Apologies were received from Derek du Preez, Graham J Levitt and Antoinette Vermeulen.

3. Matters Arising from the Minutes of the Previous Meeting:

3.1 Professor Pienaar suggested that the idea of e-mailing the newsletter be adopted and that a hard copy of the newsletter only be sent to those without a listing. Some members were averse to this as they felt that it was often referred to later on and many members did not have good printing facilities. It was generally agreed to that the newsletter in its present form be continued (Action: Dr J Adams).

3.2 Professor Pienaar requested council to pursue the issue of NBI's reticence to give phycology its due recognition as an important component of taxonomic research. The society requested that an official letter from the society expressing its dissatisfaction at the manner in which this issue had been handled be drafted. Dr Campbell further requested that such correspondence be hand delivered (Action: Dr R J Anderson).

3.3 The issue of PSSA field trips designed to produce something more tangible was raised. It was generally agreed that this would foster better ties within the society but that it be linked with the PSSA meeting as those tied to other society meeting (e.g. SASAQS) were not feasible.

These acceptance of these points *en bloc* was proposed by Dr J Adams and seconded by Professor J J Bolton.

4. President's Report: Dr R J Anderson read his report which is included in the next newsletter. Proposed by Professor R N Pienaar and seconded by Professor G C Bate.

5. Secretary/Treasurer's Report: Dr S D Sym reported that the total assets of the society are now at R 9 370.63 and for the most part are being invested in a savings account at 13% p.a. This figure is down R 2 789.18 from that received from the previous Secretary/Treasurer (R 12 159.81). It does not include expenses incurred by the Newsletter Editor during 1995. Details of the report are to be published in the next newsletter.

A suggestion that a nominal amount of the assets be invested in unit trusts did not meet with approval. The drop in the assets during 1995 solicited a recommendation that the society look to increasing its subscriptions. Dr R J Anderson reported that the profits from the current conference would inject substantially more money than that reflected as lost in the Treasurer's report. It was generally agreed that the society not increase their subscriptions and that the FRD be approached for funding to assist in procuring overseas speakers.

The acceptance of the Secretary/Treasurer's report was proposed by Dr J Adams and seconded by Dr D Keats.

6. Membership Secretary's Report: In the absence of Mr G J Levitt, the report was read by Dr R J Anderson. There are a total of 67 members; 38 ordinary, 15 student, 9 overseas, 4 life and 1 corporate. There are 9 new student members, 1 new ordinary member. The death of Professor Stanley Seagrief was noted with sadness. Two members have resigned and 13 members have been removed from the list as they are 2 or more years in arrears in subscription payment.

Professor Pienaar reported that he had extended greetings from the society to delegates present at the recent 'Symposium on the Algae and Seagrasses of the Western Indian Ocean' held in Mauritius. Many of the delegates there had expressed great interest in our Society and Professor Pienaar recommended that the Society contemplate encompassing other African states, maybe even to include a name change more in keeping with Africa as a whole. The delegates there want us to make contact with them and to send them information about the Society. It was suggested that the Society, or individual members thereof, should consider subsidizing a few memberships. Professor Bolton recommended that subsidised newsletters at least be forwarded to relevant institutions. Andre Share had established links with some other phycologists and would follow this up (Action: A Share).

In the vein of extending ties with African states, Dr Campbell reminded those present that AETFAT were to hold their conference next year. Professor Pieterse said that there was some resistance to the inclusion of phycologists at the meeting in Malawi. It was noted that it was probably too late now but that it would provide a good forum. The Society was urged to make contact with AETFAT (Action: Professor A J H Pieterse).

The acceptance of the Membership Secretary's report was proposed by Professor A J H Pieterse and seconded by Mr A Share.

7. Newsletter Editor's Report: Dr J Adams reported that 3 newsletters had been published during 1995. She wished to thank Dr R J Anderson, Dr S D Sym, Professor R N Pienaar, Professor J J Bolton, Mr G Maneveldt for their contributions and assistance. Several members, in particular Dr. D du Preez and Dr. E E Campbell, were also thanked for disseminating information from the internet, like ALGAE-L. Dr Adams stressed that the newsletter was dependent on the members for its success and that despite the information explosion from internet there was still a very real need for more local interaction.

Professor J J Bolton and Dr. D du Preez were thanked for their expertise and facilities in establishing a world-wide web site for the Society. Dr Campbell stressed that members consider this site as communal and feel free to update it personally. The site was to be kept as a quick-loading site, so that it would lack elaborate graphics. Judging by the number of contacts already made, the web site has proved very successful. Members are requested to access the site, to comment, send material, etc. Dr. du Preez is willing to maintain the site. The President thanked Dr. du Preez and Professor Bolton on behalf of council.

The acceptance of the Newsletter Editor's Report was proposed by Professor J J Bolton and seconded by Dr D Keats.

8. Election of New Council: This is due in 1996. Nominations are to be sought towards the latter half of this year. A postal ballot will be forwarded to all members (Action: Dr S D Sym).

9. General:

9.1 Professor Pienaar requested that the tradition of a Presidential Address at the end of his/her term be reinstated. This was generally agreed to. The last President to have honoured this was Professor Bolton. Both Professor Pieterse and Dr Anderson are to present their addresses at the next meeting (January 1997).

9.2 Professor Pienaar made a strong request that people/institutions inform other academic institutions if they manage to get overseas speakers/workers out to this country. Such visitors need not feel compelled to provide an address, but could simply visit these institutions.

9.3 Suggestions for future workshops were called for. Dr D Keats offered to host one, at the forthcoming conference, on the taxonomy of encrusting coralline algae. Further suggestions included one on harmful algae (Professor R N Pienaar) and the possibility of an invited speaker from the forthcoming Applied Algology Conference, although it was recognised that this could be a little late (Dr E E Campbell).

9.4 Mr A Share reported that there was a request from the conference organisers (SAREC) of the recent symposium held at Mauritius for all e-mail addresses and research interests of PSSA members to be sent to them. Mr Share agreed to take up all communication with them. He requested that all research interests be updated.

10. Venue and Date of Next PSSA Congress Dr Keats proposed that the present trend of a venue separate from an established institution be maintained in future. The next SAAB congress was noted as being held at Fort Hare and Professor Bate offered the services of UPE subject to consultation with his department. This is to be confirmed later.

The council were thanked for their efforts during 1995.

There being no further matters to deal with, the meeting was closed at 18h04.

D Sym (Secretary/Treasurer)

Dr R J Anderson (President, PSSA)

PSSA 13th CONGRESS -PRESIDENT'S REPORT

On behalf of the Society, I would like first to thank the other members of council for work which they put in to keep the PSSA healthy and functioning during 1995.

Thanks to electronic mail, it was not necessary for the council to meet during the past year, which I believe has been a successful one for the Society.

In financial terms, the Society is on a strong footing. We are able to sponsor visiting lecturers on a fairly regular basis, support the other functions such as the newsletter, and show steadily increasing capital. Are we fulfilling the first and main aim of the PSSA - to promote phycology in Southern Africa?

Prof. Richard Norris, in his President's report to this Society 10 years ago, stressed the importance of doing, and publishing, good scientific research. The evidence that our members are doing this can be found at this Congress, and in the phycological theses and publications listed in some of the 1995 newsletters. He further remarked that in the USA phycology was under assault, and that any university with more than one phycologist regarded itself as a "centre". If that is the case, we now have centres of phycology all over South Africa.

The newsletter is undoubtedly one of the most important organs of any society, and I think we have been fortunate in having a series of dedicated editors, producing very good newsletters. I would like to thank Janine Adams for the excellent job she has done, and I urge members to make greater use of our newsletter. With electronic mail, sending news, abstracts etc. is dead easy. Maybe the editor should plague us with rapidly-mailed reminders.

Dr. Rob Anderson, President & chairman of the 1996 congress organising committee.

On the down side, the PSSA held several workshops during its early years, but this has not continued. Perhaps we should think of reviving this excellent idea.

An important event that has already had an effect on this Society is the political change that occurred in South Africa in 1995. South Africa is no longer viewed by the world community as untouchable, and all sorts of possibilities are opening up for contact and collaboration with other countries. We should now be looking at learning as much as we can from overseas phycologists, and using their experience to enrich ourselves. Perhaps the best example of our changed status is in the selection of this country as host to the 17th International Seaweed Symposium in 2001. In fact, we have been approached to host the International Phycological Congress in the same year, but have had to regretfully refuse.

This Society has been criticised for being a "splinter group", one split off from the larger body of botanists or aquatic scientists in South Africa. We are further accused of parasitising them when it suits us, for example by holding congresses "on the back" of a larger society. The PSSA is "organism- based" in the sense that we all study algae. This was the intention when the Society was founded, and I believe it remains one of our main strengths. The organismic approach began to fall out of favour a few decades ago, and now phycology as such is not a subject at many universities. The emphasis changed to grander concepts like ecosystems or ecosystem functioning, but more recently the interest in biodiversity is putting the organism back on centre stage.

There is no question that algae remain important on the sub-continent. Most of southern Africa is subject to critical shortages of fresh water, and phycologists will become increasingly useful in our attempts to understand and manage our rivers. We also have a long and ecologically diverse coastline, with enormous potential for phycological research and development, in fields that range from economic seaweeds to phytoplankton. Provided that we continue to do good research, and that we make our findings available to wider audiences, we should play an even bigger role in future.

During 1995 Mr Levitt, our Membership Secretary, tried hard to recruit members in other southern African countries, but with very limited success. The Phycological Society of Southern Africa was founded in 1982. Considering the political situation at the time, the founders showed foresight and no small amount of optimism in calling it the Phycological Society of Southern, rather than South, Africa. I think we can accept that in 1996 this Society is healthy and functioning - probably the greatest challenge that we face is to now make it a truly southern African Society.

Rob Anderson
January 1996

Report on 13TH PSSA congress and field trip.

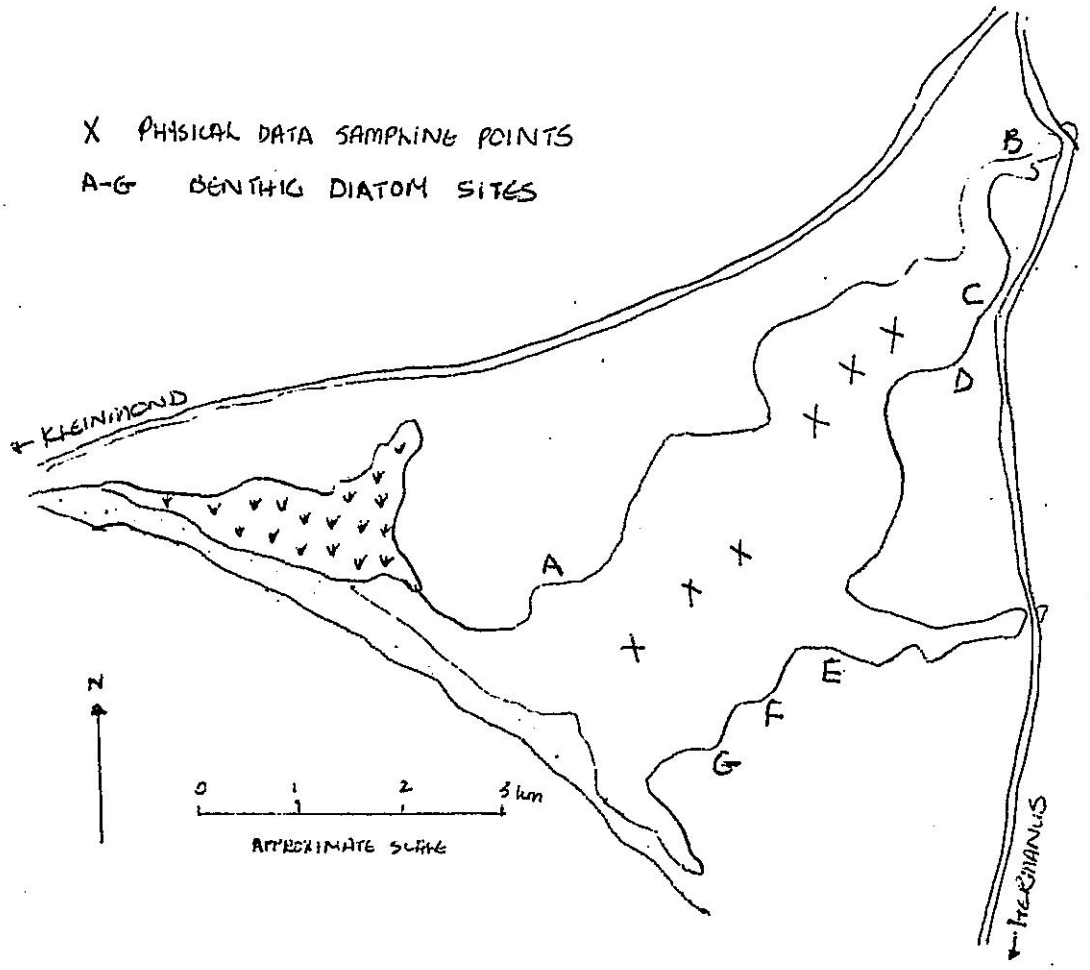
The 1996 Congress was held at Meerensee, Hermanus. The venue was perfect. Delegates were housed in bungalows that were a short walk from the conference and dining hall which overlooked the sea and Bot river. Guest speaker was Dr David John, from the Natural History museum. The title of his paper was "Biodiversity and Conservation: a seaweed perspective." There were 25 other oral presentations on a variety of topics. All papers and posters were of an excellent standard.

The field trip took place at the Bot River estuary. Delegates went their own way to pursue their particular phycology interest and reported back on their findings the next morning. Salinity and temperature was sampled at six stations as indicated on the map. Salinity varied from 34 ppt at the mouth to 31 ppt in the upper reaches. Temperature varied from 21 °C at the the mouth to 24 °C in the upper reaches. The system was shallow with a depth of 1.3 m at the mouth and 2.3 m for the middle stations.

The filamentous green algae, *Enteromorpha*, *Cladophora* and *Chaetomorpha* were common. *Gelidium* and *Ectocarpus* were found on the rocky outcrops. Associated with the reed beds were blue-green algae such as *Nostoc* and *Lyngbya*. *Oedogonium*, *Spirogyra* and *Brachysternum* were found at the site where freshwater enters the estuary. Epipelic diatoms were sampled at the sites indicated on the map. The dominant species were:

Site	Dominant epipelic diatom
A	*Achnanthes delicatula*
B	*Nitzschia* sp
C & D	*Cymbella* sp
E & F	*Navicula gregaria*
G	*Petroneis* sp

In the surf-zone *Chaetoceros* formed part of the brown mucilaginous aggregates. Thirteen dinoflagellate species were found with the dominants *Prorocentrum*, *Peridinium* and *Dinophysis*. *Amphora* was the dominant diatom and fifteen other diatom species were noted.



MAP OF THE BOT RIVER ESTUARY.

Congratulations to the following winners at the 1996 PSSA congress

SASCA (South African Seaweed Concessionaires Association) prize for best paper and best poster relevant to development of commercial seaweed resources in South Africa.

SASCA best paper award:

Dr Wendy Stirk

for her paper entitled:

"Screening seaweeds for Prostaglandin-synthesis inhibitors" by W. Stirk, A. Jager and J. van Staden, Department of Botany, University of Natal, Pietermartizburg.

SASCA best poster award:

Mr A.J. Smit

for his poster entitled:

"Raft cultivation of *Gracilaria gracilis* in Saldanha Bay: The effect of strain and site selection on yield" by A.J. Smit, R. Anderson and J. Bolton. Department of Botany, University of Cape Town.

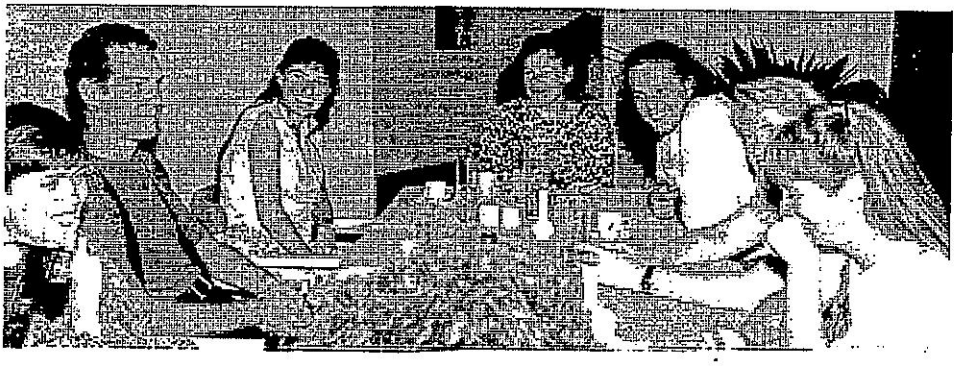
PSSA prize for the best student oral presentation:

Mr G. Maneveldt

for his paper entitled:

"The role of grazing in the control of morphology and ecology of an encrusting coralline alga: a geographical survey" by G. Maneveldt and D. Keats. Department of Botany, University of the Western Cape.

GAVIN & WENDY RECEIVING THEIR PRIZES FROM DR. DAVE JOHN.



DELEGATES ENJOYING THE CONFERENCE DINNER.

Noxious *Gymnodinium* species in South African waters.

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At the height of the 1995-96 summer season, beachgoers and seaside residents in South Africa's largest bay, False Bay (Fig. 1), were overcome by the discomfort of coughing, burning of the nasal passages, difficulty in breathing, stinging eyes and irritation to the skin. Microscopic examination of water samples from the bay, which had turned a dirty olive-green colour, revealed the presence of a *Gymnodinium* first recorded in False Bay in 1988. The noxious gases associated with the plankton bloom were initially reported in the Fish Hoek, St James and Muizenberg areas, but later the effects were also felt at Monwabesi and Koeelbaai on the eastern side of False Bay before spreading to the coastal resort of Hermanus in Walker Bay (Fig. 1). These conditions persisted for several weeks. Although the discomfort experienced was considerable, symptoms were usually relieved on leaving the area, an no long-term effects were noted.

Rapid growth of the human population on and near the margin of False Bay has placed increasing demand on it both as a prime recreational area and as a site of disposal of solid and liquid waste. Media interest in this noxious bloom was therefore intense and the event received considerable exposure. Many unsubstantiated reports attributed the bloom either to the increased discharge of sewage into the bay, or to the introduction of the species through ballast water discharge by damaged oil tankers seeking shelter and undergoing repair in the bay.

In 1988, when the *Gymnodinium* species responsible for this event was first recorded in local waters, surfers, swimmers and fishermen suffered eye, nose and throat irritations. The following year a bloom of the same species was responsible for extensive mortalities of mostly sub- and intertidal fauna, including an estimated 40 tons of abalone in the H.F. Verwoerd marine nature reserve (Fig. 1; Horstman *et al.*, 1991).

Despite this species having bloomed on several occasions since it was first observed, never have the noxious effects to humans been so evident as during the 1995-6 event. However, faunal mortalities were small, with the exception of the larval mortalities experienced by several land-based abalone farmers in the Walker Bay area. Furthermore, mussels collected from Muizenberg and tested by means of mouse bioassay (Delaney, 1985) were found to be toxic, and a warning was issued against the collection of shellfish.

Attempts to identify the *Gymnodinium* species present in False Bay were interesting in that although it possesses characteristics associated with several other toxic marine dinoflagellates, it also has features which distinguish it from these species. For example, the presence of aerosol toxins resulting in respiratory distress in humans has been associated with *Gymnodinium breve* Davis blooms off the west coast of

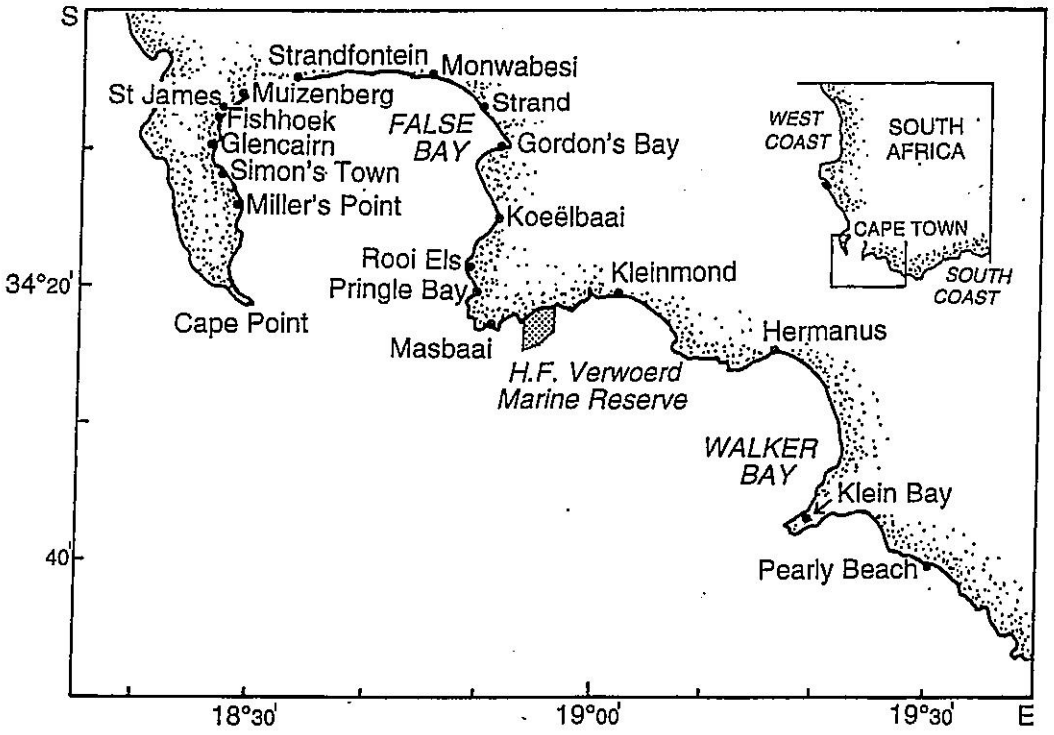


Fig:1. False Bay and Walker Bay.

Florida for many years. The False Bay species is, however, morphologically dissimilar in that it does not possess the apical crest so distinctive of *G. breve*. Instead it bears a greater resemblance to *Gymnodinium mikimotoi* Miyake et Kominami ex Oda (*G. mikimotoi* is conspecific with *G. nagasakiense* Takayama and Adachi and is a senior synonym for the latter, Takayama and Matsuoka, 1991) common in Japanese waters, and to the north European species *Gymnodinium aureolum* Hulburt. Morphologically the resemblance to *G. Mikimotoi* is particularly strong in that the cells are similar in size, are dorso-ventrally flattened, an apical groove is sculptured on the epicone, and girdle displacement and the number and shape of the chloroplasts are essentially identical. The local species, however, differs from *G. mikimotoi* in the shape and positioning of the nucleus. In *G. mikimotoi* an ellipsoidal or reniform nucleus is longitudinally orientated within the left hand side of the cell, whereas the nucleus of the local species is horizontally orientated within the hypocone (Fig. 2). Furthermore, although *G. mikimotoi* and *G. aureolum* have been associated with mortalities of marine fauna, the presence of aerosol toxins as encountered in False Bay he apparently not been associated with these species.

The *Gymnodinium* described here therefore appeared to be unique until 1993, when New Zealand experienced its first problems associated with algal blooms. Initial indications of a toxic alga in New Zealand waters were mortality of marine organisms on reefs, an outbreak of coughing by many people as a result of exposure to sea spray aerosols, and the identification of Breve-like lipid soluble toxins in affected shellfish (Mackensie *et al*, 1995). The responsible *Gymnodinium* species was also found to bear a strong resemblance to *G. mikimotoi* but, s is the case with the False Bay species, the nucleus was horizontally oreintated within the hypocone rather than in the left lobe of the cell as in *G. mikimotoi*. This feature according to Mackensie et al (in press), is a distinctive and invariable characteristic of the species.

Together these observations indicate the presence of a toxic southern hemisphere *Gymnodinium* species, which shares certain features with toxic northern hemisphere *Gymnodinium* species but, has other characteristics which may be sufficient to discriminate it form these species.

References.

Delaney, J.E. 1985 - Bioassay procedure for shellfish toxins: Method for *Ptychodiscus brevis* toxin(s). In: *American Public Heath Association Laboratory Procedures for the examination of sea water and shellfish*, eds, A.E. Greenberg and D.A. Hunt, pp:74-80.

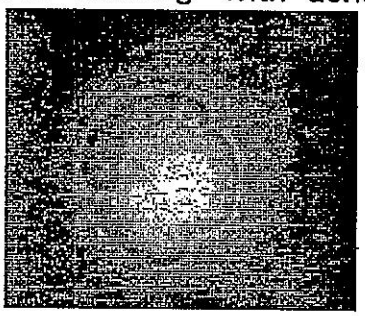
Horstman, D.A., S. McGibbon, G.C. Pitcher, D. Calder, L. Hutchings and P Williams 1991 - Red tides in False bay, 1959 1989, with particular reference to recent blooms of *Gymnodinium sp. Trans Roy. Soc. S. Afr.*, 47(4&5): 611-628.

Mackensie, L., L. Rhodes, D. Till, F.H. Chang, H. Kaspar, A. Haywood, J. Kapa and B. Walker 1995 - A *Gymnodinium* sp. bloom and the contamination of shellfish with lipid soluble toxins in New Zealand, Jan - April 1993. In: *Harmful Marine Algal Blooms*, eds, P. Lassus, G. Arzul, E. Erard, P. Gentin and C. Marcaillou, Techniques et Documentation - Lavoisier, Intercept Ltd, pp: 795-800.

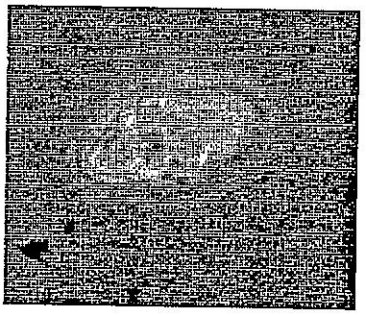
Mackensie, L., A. Haywood, J. Adamsom, P. Truman, D. Till, M. Satake and T. Yasumoto *In press* - Gymnodimine contamination of shellfish in New Zealand. In: *Proceedings of Seventh International Conference on Toxic Phytoplankton.*

Takayama, H. and K. matsuoka 1991 - *Gymnodinium mikimotoi* Miyake et Kominami ex Oda and *Gymnodinium nagasakiense* Takayama et Adachi. *Bull.Plankton Soc. Japan*, 3891):-53-68.

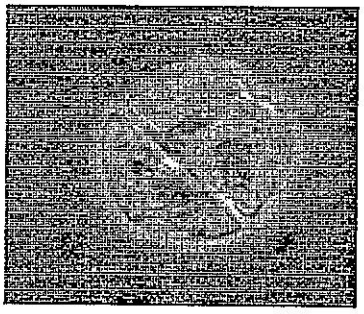
(c) Visualization of the nucleus under UV fluorescence after staining with acridine orange



to show the shape and location of the nucleus.



(b) Lateral view



(a) Dorsal view

Fig:2. Light micrographs of the *Gymnodinium* species from False Bay

AN IDENTIFICATION KEY FOR ESTUARINE DIATOMS

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INTRODUCTION

A great number of texts are available on the genera of diatoms, some having been written as long ago as 1853 (Smith 1853). From the point of view of water ecology, such texts are not helpful to the pure ecologist because they are too voluminous, they may not be easily available, or they lack a systems approach to establishing the name of a particular taxon. In addition, many of the early taxa have been renamed in recent times (Round *et al.* 1990).

A computerised key for the identification of estuarine diatoms was developed. The principle behind the key is that only the dominant species are important. This greatly reduces the total number of species which require to be identified. When a "new" species is found it can easily be added to the system. This work is a collaborative effort with Professor Frank Round, Bristol University, U.K. He provided the basis of the identification scheme by correlating the most important feature on which the taxonomy of each genus is based.

DEVELOPMENT OF THE DIATOM IDENTIFICATION KEY

Using a computer the names of the 78 diatom genera, already identified in our studies in Cape estuaries, were entered into a Lotus 1-2-3 spreadsheet. Forty-six diagnostic features were selected from Barber and Haworth (1981) and entered as a single word descriptor as the top row in the spreadsheet. From Round *et al.* (1990), between 2 and 13 diagnostic characters were provided for each genus.

HOW TO USE THE IDENTIFICATION KEY

Once the 1-2-3 database was complete, it was taken into a Lotus Approach DBase IV file which is used in Forms mode. Using "Find", characteristics of the unknown diatoms are entered into the blank form. When all recognisable attributes have been entered, "Find" is activated. The Lotus Approach program matches the attributes entered into the "Find" form and compares them with the database. It then produces an output indicating the number of "hits" in which all the characteristics entered match the database.

EXAMPLE

The diatom shown in the Figure is used as an example. We were only able to recognise that the specimen was lanceolate and sigmoid. These attributes were entered. "OK" was pressed and two "hits" were registered. The first was *Gyrosigma*. The form showed that further information on the genus could be found on page 586 of Round *et al.* (1990). Visual examination showed that the specimen in question could well be *Gyrosigma*. The second possiblity was *Pleurosigma* which could be found on page 580 of Round *et al.* 1990. An examination of the differences between these two genera showed that the striae in Pleurosigma run at an angle of > 90° to each other whereas in Gyrosigma they run at an angle of 90° to each other. With this information we were able to choose *Gyrosigma* as the most likely genus.

DISCUSSION

An important feature of the method devised is that it provides a system which can be used by an amateur, but, more importantly, it provides the basis of a teaching tool so that the user quickly becomes reasonably proficient at recognising details of diatom morphology. We recommend the system to students and to researchers who wish to embark on a programme of water research.

Within this identification system, only data which is relevant to a particular system need be included. It is possible to include the data for all known taxa, but if marine systems are the focus of the research effort, it may be possible to exclude all freshwater taxa. Likewise, if rivers are being studied all the marine taxa may be excluded. The key developed for identification of estuarine diatoms has great potential if further developed for use as a water management tool. This is because diatoms respond rapidly to changes in water chemistry.

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Round, F.E., R.M. Crawford and D.G. Mann. 1990. The Diatoms. Biology and Morphology of the Genera. Cambridge University Press, Cambridge. 747 pp.

Smith, W. 1853. A synopsis of the British Diatomaceae, with remarks etc. London Volume 1.

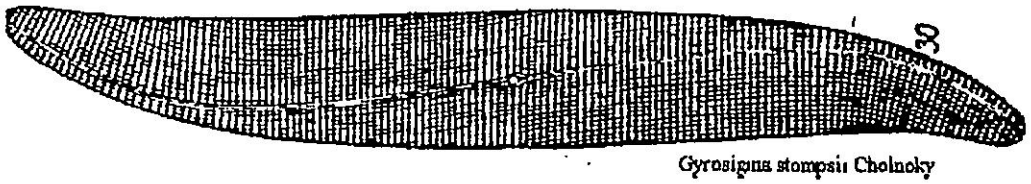

FIGURE .: Example of the *Gyrosigma stompsii* diatom taken from Cholnoky (1962) to illustrate the type of information that a researcher might have available for use in the identification of a species.

Forthcoming Conferences

50 TH ANNIVERSARY MEETING OF THE PHYCOLOGICAL SOCIETY OF AMERICA, UNIVERSITY OF CALIFORNIA, SANTA CRUZ
JULY 14-19, 1996

CONTACT:
Prof Paul Kugrens
e-mail: pkugrens@lamar.colostate.edu

FIRST ASIAN PACIFIC PHYCOLOGICAL FORUM, UNIVERSITY OF NEW SOUTH WALES, SYDNEY, AUSTRALIA. JULY 22-26, 1996

CONTACT:
The Secretariat
e-mail: j.vivas@unsw.edu.au

1ST EUROPEAN PHYCOLOGICAL CONGRESS, COLOGNE, GERMANY. AUGUST 11-18, 1996

CONTACT:
Prof Michael Melkonian
e-mail: mmelkon@novell.biolan.uni-koeln.de

14 TH INTERNATIONAL DIATOM SYMPOSIUM, NATIONAL OLYMPIC MEMORIAL YOUTH CENTER, TOKYO. SEPTEMBER 2-8, 1996

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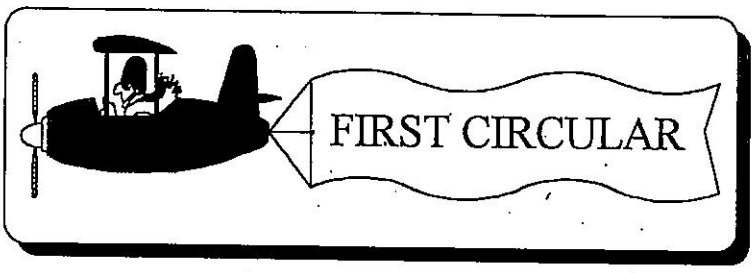
THE SCOTTISH ASSOCIATION FOR MARINE SCIENCE: ALGAL BLOOMS AND TOXINS IN ESTUARINE AND COASTAL WATERS. UNIVERSITY OF DUNDEE, SCOTLAND
SEPTEMBER 16-18, 1996

CONTACT:
Dr S.G. Bell
e-mail: s.g. bell@dundee.ac:uk

VIII INTERNATIONAL CONFERENCE ON HARMFUL ALGAE, VIGO, SPAIN
JUNE 25-29, 1997

CONTACT:
Tim Wyatt
e-mail: twyatt@IIM.CSIC.E



14 TH CONGRESS OF THE PHYCOLOGICAL SOCIETY OF SOUTHERN AFRICA

We hereby announce the 14th congress of PSSA. The congress will be held on 20-22 January 1997 (Monday to Wednesday after SAAB). We are investigating several venues including Jeffrey's Bay and Tsitsikamma. If you are planning to attend and would like to receive subsequent circulars please E-Mail the following information or fill in this form and return it to us by 15 June 1996. Information about the congress will be updated periodically on the WorldWideWeb at http:///www.upe.ac.za/botany/pssa/conf97.htm.

We are planning to have both Golf shirts and shorts (baggies) on sale. Please indicate whether you would be interested in purchasing one or both of these items.

Name:

Address:

E-mail address:

Telephone number: Fax number:

I would be interested in buying a Golf shirt: yes/no
a pair of baggies yes/no

Our E-mail address is: **PSSA@upe.ac.za**

Snail-mail is PSSA Congress, Department of Botany, PO Box 1600, Port Elizabeth, 6000.

You can expect the second circular (preferably on E-Mail) by July.

Thank-you

Eileen Campbell
Secretary, LOC

Application for PSSA membership.

Name:.....

Address:.....

.....

Tel:.....

Fax:.....

E-mail:.....

The Phycological Society of Southern Africa aims to promote an interest in phycology and establish and maintain communication between persons interested in the algae of Southern Africa and, by way of the newsletter, to collate and disseminate information concerning the Society, it's members and matters of mutual interest.

Signature:.....

Date:.....

Indicate category of membership required (fees in SA Rand):

Student membership	R 20
Ordinary membership	R 30
Ordinary membership (overseas)	R 40
Corporate membership	R 240
Life membership	R 300

Please send to:

Membership Secretary
PSSA
Department of Botany
University of Cape Town
Private Bag
Rondebosch
7700
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