

Forum Phycologicum



Newsletter of the
**Phycological Society
of Southern Africa**

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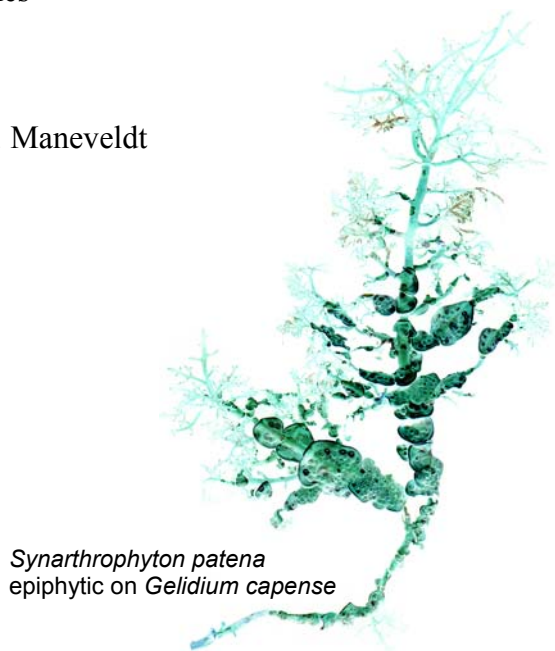
From the Editor

Welcome to another edition of *Forum Phycologicum*. In this edition I would like to draw your attention to some of the issues on *News and Reviews*. Firstly there is an invitation from Salomão Bandeira to join them at the 5th WIOMSA Symposium to be held in Durban later this year. Secondly, as you may well be aware, there has been a proposal to open the Tsitsikamma National Park and its associated marine protected area to shore fishing by local communities. This has no doubt sparked much heated debate (see appendix for a copy of the article that appeared in the Cape Argus on May 5) and the marine fraternity has voiced a call for support. We continue the *World Science* segment with articles of more general interest to the global community with a particularly interesting article on bio-fuels; it appears that bio-fuels may not be as safe as has been previously suggested. The featured article for this edition demonstrates the popularization of seaweeds by the media, with *kelp coming into the mainstream*.

Please don't forget that the next PSSA conference is fast approaching, so keep an eye on the website for updates.

Until the next issue.
Best wishes

Gavin W. Maneveldt



Synarthrophyton patena
epiphytic on *Gelidium capense*

News and Reviews

1. 5th WIOMSA Symposium

The Western Indian Ocean Marine Science Association (WIOMSA) and the Oceanographic Research Institute (ORI) have the pleasure to announce the 5th WIOMSA Scientific Symposium, with the theme “*Science, Policy and Management: pressures and responses in the Western Indian Ocean region*”.

“WIOMSA is probably the largest Western Indian Ocean region organization in marine science and we might find a common ground for promotion of phycological research in both WIOMSA and PSSA for the common benefit of southern Africa and the Western Indian Ocean region” reiterates Salomão Bandeira.

Date & Venue

22 - 26 October 2007
The Holiday Inn,
Durban Elangeni
Conference Centre,
Durban.



Deadlines

Although the deadline for submitting abstracts has passed (30 April 2007), PSSA members in the area should please feel free to contact the organisers and attend the symposium.

Contact Details

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2. Report on the XIX International Seaweed Symposium

The International Seaweed Symposium (ISS) is the foremost international meeting on seaweed research and utilization and provides a forum for scientists, technologists, industry and resource managers to present their latest research results and develop new synergies. The XIX ISS was held from 26-31 March 2007 at the Kobe



International Conference Center in Kobe, Japan and was hosted jointly by the Japan Seaweed Association, the Japanese Society of Phycology and the Japanese Society of Marine Biotechnology. This was the second ISS meeting organized in Japan (the first took place Sapporo in 1971) and attracted some 535 participants from 46 different countries; of this, 90 participants were student delegates.



Some of the South African delegates who attended the conference. Left to right: Mark Rothman (MCM), Deborah Robertson-Andersson (UCT), Karen Whyte (West Coast Abalone) and Gavin W. Maneveldt (UWC).

The conference theme was *Seaweeds: Science and technology for Traditional and Modern Utilization*. To accommodate the large number of participants and presenters, the conference was organised daily into 4 parallel sessions of invited speaker mini-symposia, followed by 4 parallel sessions of contributed papers; the surplus papers were presented as poster presentations. All of these were preceded by an opening plenary lecture by a world-renowned specialist. All in all, 4 plenary lectures, 108 Mini-symposia, 79 Contributed papers and 167 Poster presentations were delivered. The opening day of the conference was supplemented by 4 workshops ranging from an *Introduction to Seaweed Industries in Japan* to *Seaweed Cultivation in Asian Countries* to *Functional Components of Seaweeds* to the *Ectocarpus Genome Project and Biology of Ectocarpus Species*. In addition, a special commercial seaweed exhibition was held for much of the duration of the conference.

Did you know?

BMW door parts are made from green tides of *Ulva lactuca* in France and pot plant pots made of *Ulva* produce bigger and healthier plants compared to ones grown in ordinary clay pots?

An experience of the XIX ISS by Deborah Robertson-Andersson

The XIX ISS was held on the man made Port Island in Kobe Bay in the Seto Inland Sea. The island was originally a mountain that had taken 20 years to move into the sea. Kobe – meaning to pay taxes – is the fourth largest city in Japan with a population of over 1.5 million.

This conference was different to the other two I had attended in Cape Town (Jan/Feb 2001) and Bergen (June 2004). The conference has changed from its past history of largely supporting the phycocolloid industry to a much wider range and diversity of research topics, some of which I was unaware.

I was amazed to learn that seaweeds may play an important role in the future of global warming with seaweeds being cultivated not for bio-fuel or for food, but as a sink for excess CO₂. This is particularly being funded in Korea. There were discussions about growing seaweeds and then attaching them to the ocean floor and swapping this production for carbon credits from the Kyoto protocol. I was also interested to learn that a non-spermicidal microbicide called Carraguard, derived from the carrageenan found in certain seaweeds and used in the food industry as a thickener, emulsifier and stabilizer, had finished its phase three clinical trials in South Africa. Carraguard may block the transmission of HIV/AIDS and provide women with opportunities to lower the risks of contracting the disease. This product was first mentioned in the symposium in Bergen and it was great to hear a follow up, particularly as the research and development costs then were estimated to be US\$775 million over five years and the product was deemed non profitable.

I particularly enjoyed the integrated aquaculture (Thierry Chopin has coined the term **Integrated Multi-Trophic Aquaculture** or **IMTA**) mini-symposia, which for the first time ran for an entire day. There were talks by most of the leading researchers in this field and it was fascinating to see the range and diversity of projects that can be considered integrated aquaculture. I was also



Nori gift-packs ranging from simple packed sheets to executive containers.



Mark Rothman purchasing some seaweed sweets (photos: GW Maneveldt).

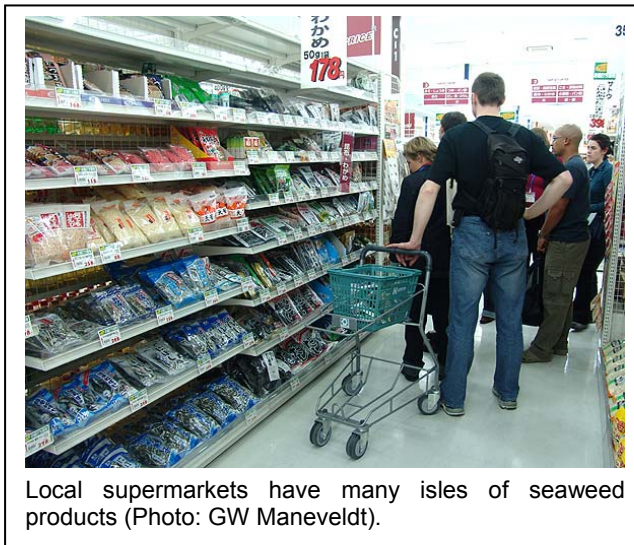


A display of kombu products.

impressed to learn that this type of aquaculture is not just about providing an alternative food source, but also a means of conservation. In Thailand, for example, it is being used to encourage the use of abandoned shrimp ponds and even thought to expand the life and production capacity of existing shrimp ponds. The biggest integrated aquaculture project at the moment is the salmon, mussels and seaweed project in Canada involving 61; the project I have been working on wasn't far behind with 41 people. Most of the studies showed that there was not only a need for integration across trophic levels and the environment, but also with researchers and between researchers and industry. The Canadian project was also interesting in that their biggest problem was changing the existing legislation, which at the time prevented this type of cultivation. In South Africa we are fortunate in that our legislation actually encourages this type of cultivation.

I spent an afternoon in the seaweed exhibition centre and was amazed by the variety of products, both food and otherwise, that were available from seaweeds. I was asked to taste test some new seaweed cup-a-soups and I must say, one of them

was by far the best I had ever tasted. In South Africa we can typically buy nori sheets in only one size. At the exhibition one company sold nori from China, Japan, Korea and Vietnam, and marketed each of these as different products, and in different sizes. To my untrained eye and also because I can't read Japanese they all looked the same. This was reinforced when we later went around to a supermarket in which I counted five isles of seaweed products. At the exhibition I was even able to get seaweed shampoo, a seaweed facial, seaweed soup, seaweed noodles, a light shaved kombu snack, some jelly made from seaweeds, seaweed sweets and even ice-cream.



Local supermarkets have many isles of seaweed products (Photo: GW Maneveldt).

For the mid symposium tour I chose to visit a fisherman's co-operative nori processing plant. The co-operative consisted of 1250 people with about 360 families growing nori. This co-operative handles about 50% of Japan's total nori sheet production (roughly 100 billion sheets). The seaweed production and quality in this area had decreased due to an increased environmental effort to reduce fertilizers and nutrients in peoples' gardens which then leached into the bay, and this meant that in 2006, Japan had to import about 25



billion sheets from China. Although all the seaweeds were produced here during one season, they were sold at 4 auctions during the year, during which about 60 different companies came to assess and buy the nori sheets. While one sheet of nori cost 80¥ (\pm R5.20) in 2005, it now sells for only 10¥ (\pm R0.65) in 2007; currently, a sheet of Chinese nori sells for only 6¥ (\pm R0.39). The Japanese nori is, however, supposedly of a better quality and about 10% of the Chinese population eats the Japanese nori.



Harvesting of Nori nets (photo: D Robertson-Andersson)

From the plant we were taken out by boat to the nori farms and were shown the nets, which stretched out to sea as far as the eye could see. We were also shown how the nets are harvested and how they are washed to remove epiphytes. I was struck by how seemingly clean the water was even though the bay was exceptionally calm and we had not had any wind for the whole time I had been in Kobe. From there we were taken to a nori (The Awaji Nori Centre) and a wakami (*Undaria*) seeding facilities.

My lasting impression of Kobe was a city that has rebuilt itself twice in the last 50 years, from complete destruction through man-made and natural events, to a modern and vibrant city owned by the people. Visiting Japan showed me what could be possible in South Africa.

Awards received by PSSA members

Japan Seaweed Association – First Prize in Applied Seaweed Research

Hurtado AQ, Trespoey A, Bleicher-Lhonneur G and Critchley AT. Effects of epiphytes on the growth and carrageenan quality of *Kappaphycus striatum* var. *sacol* at different stocking densities, days and depths (presented by Alan Critchley).

The University of British Columbia Award for the best student oral paper – Second Prize

Robertson-Andersson DV, Bolton JJ, Troell M, Anderson RJ, Maneveldt G, Halling C, Smit AJ, Probyn T and Peall S. The Evolution of Integrated Seaweed cultivation in temperate Southern Africa.

3. Department of Trade and Industry – Aquaculture Development

May 28, 2007

The Department of Trade and Industry (DTI) has contracted Enviro-Fish Africa (Pty) Ltd (an independent company operating under the auspices of Rhodes University) to review the current status of aquaculture production in South Africa, and to recommend strategies that the DTI could implement to promote sector development. The DTI is a key government player responsible for promoting trade and sector development, and aquaculture, being a very young industry, has special development needs, which fall within the DTI mandate. The DTI initiated its SMEDP Aquaculture Policy in 2003, has co-funded the establishment of a shellfish sanitation programme to enable shellfish producers to export to the EU, and provided support for SEDA to promote aquaculture projects. While these interventions have been welcomed by industry, their impact on sector development has perhaps not always met expectations, and it is clear that much more can be done by the DTI to support aquaculture sector development. The DTI now wishes to develop customized, sector specific interventions to promote the development of the aquaculture



sector. The project thus presents an important opportunity for stakeholders to make inputs and suggestions, which will shape the DTI's response to the sectors needs.

Over the coming months, the Enviro-Fish Africa team will be contacting key stakeholders to obtain information and elicit views that will be used to assist in the development of the Department's sector strategy. If you would like your views to be included in the study, or would like to discuss the study, please contact Peter Britz (p.britz@ru.ac.za) or Tom Shipton (t.shipton@envirofishafrica.co.za).

Peter Britz

*Department of Ichthyology and Fisheries Science
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Website: <http://www.envirofishafrica.co.za>

4. Tsitsikamma – Statement of Concern

Recently there has been debate around the proposed opening of the Tsitsikamma Marine Protected Area to shore fishing by local communities. This has already met with much resistance from the scientific community who under the leadership of Bruce Mann has compiled a "statement of concern". Bruce attempted to do this on behalf of SANCOR but when the issue was discussed at the last forum meeting on the 23rd May in Durban, the NRF stated that they could not be seen to be associated with the statement. It was then decided that the statement would still be sent to the Minister, but on behalf of the "marine science community of South Africa" and individuals could put their names on the statement in their private capacities or as representatives of their respective institutes (and not under the banner of SANCOR). What follows is the "statement of concern" circulated to the SANCOR community. Although it may be too late to add your names to the document, this piece has been included as way of informing you all. Attached is a copy of a balanced newspaper article (Appendix I) giving more detail on the issue.

June 5, 2007

STATEMENT OF CONCERN

To: The Minister of the Department of Environmental Affairs and Tourism
From: The Marine Science Community of South Africa
Re: Allowing fishing in the Tsitsikamma National Park.

We, the marine science community of South Africa, represented by our affiliation to various universities, research institutes, museums, conservation bodies and other organizations, or in our personal capacities, do hereby offer our learned advice that the Tsitsikamma National Park should remain closed to any form of fishing.

This issue has been debated amongst top marine scientists in South Africa and it is our unanimous opinion that under no circumstances should the Tsitsikamma National Park be opened to any form of fishing whatsoever. The reasons for this decision are based primarily on biological and economic reasons as follows:

1. South Africa is signatory to international agreements and protocols to establish and maintain marine protected areas (MPAs), *inter alia* the Convention on Biological Diversity, the World Summit on Sustainable Development and the Resolutions of the World Parks Congress.
2. The Tsitsikamma National Park is our oldest (proclaimed in 1964) and largest "no-take" MPA and makes a substantial contribution to marine biodiversity protection in the Agulhas Bioregion.
3. The marine biodiversity protected within the Tsitsikamma MPA is of immense value to the nation as a whole and its protected status should not be compromised by the needs of a few. In this regard it provides us with an invaluable benchmark against which changes in adjacent exploited areas can be measured.
4. The precedent set by opening a national park, which is zoned as a "no-take" MPA, to harvesting, could jeopardize the status of other protected areas (both marine and terrestrial) in South Africa.



5. According to the recent Agulhas Bioregion Systematic Conservation Plan, the marine biodiversity protected within the Tsitsikamma MPA is “**irreplaceable**” and if compromised by societal needs, would have to be replaced elsewhere along the coast to achieve effective marine biodiversity protection targets.
6. There are many species of linefish (particularly resident, reef-associated species) protected within the Tsitsikamma MPA. Many of these species have been severely over-fished (i.e. to below 25% of their pristine biomass) in exploited areas outside the MPA.
7. Most of these species are slow-growing, late-maturing and resident for at least part of their lives, making them exceptionally vulnerable to exploitation. It will thus take very little fishing effort to deplete the linefish stocks in Tsitsikamma.
8. Research has shown that the abundance and size of many of these resident fish species, and of inter and subtidal invertebrates, is considerably greater within the MPA compared to adjacent exploited areas. Furthermore, it has been shown that these protected stocks are able to “seed” adjacent exploited areas by export of eggs and larvae and that there is also “spillover” of juveniles and adults into adjacent exploited areas.
9. The greater size and age of fish protected within the MPA ensures that they can produce a considerably greater number of more viable offspring which are genetically “fitter” than those produced by smaller fish in exploited areas.
10. Opening of the MPA to fishing would thus result in the rapid depletion of healthy stocks to the detriment of the local fishery and, more importantly, to the detriment of the commercial and recreational fisheries operating in areas adjacent to the MPA. The short-term benefits accrued by communities given access to fish in the MPA would therefore result in a net loss to both marine biodiversity and linefishing industry as a whole, as evidenced by recent economic surveys and analyses.
11. As scientists we need “evidence based” arguments and we have very valuable economic and social research on the issue commissioned by WWF and carried out by Anchor

Environmental Consultants (see report on WWF website). This report shows that the total economic value of the Tsitsikamma MPA (including Robberg and Goukamma MPAs) is estimated to be in the order of R 33 million per annum (this includes export of fish which adds value to recreational and commercial fisheries in surrounding areas).

12. Opening of the Tsitsikamma MPA to fishing, even if only in small areas along the shore for coastal communities living directly inland of the MPA, is thus contrary to all scientific advice provided by both government and independent scientists.
13. We are certain that an alternative solution could be found to provide adjacent communities with benefits from the MPA rather than by allowing direct access by fishing. For example, the tourist trade associated with the park could support much expanded community based enterprise if the community is empowered to participate.

The marine science community of South Africa thus appeals to you not to allow any fishing in the Tsitsikamma MPA and that other means are found to compensate any communities claiming restitution. Should you require more information we would be most willing to assist you.

Bruce Mann

Oceanographic Research Institute

Email: bruce@ori.org.za

World Science

1. Ethanol vehicles do pose a health risk

April 18, 2007

Courtesy: Stanford University and World Science

(<http://www.world-science.net/>)

Ethanol is widely touted as an eco-friendly, clean-burning fuel; its production has soared in recent years. But if every vehicle in the United States ran on fuel made mainly from ethanol instead of gasoline, it would likely lead to more respiratory-related deaths and hospitalizations, a new study indicates.



The work, by atmospheric scientist Mark Z. Jacobson of Stanford University in Stanford, Calif., appears in the April 18 online edition of the research journal *Environmental Science & Technology*. “Ethanol is being promoted as a clean and renewable fuel that will reduce global warming and air pollution,” said Jacobson. “But our results show that a high blend of ethanol poses an equal or greater risk to public health than gasoline, which already causes significant health damage.”

Jacobson used a computer model to simulate air quality in the year 2020, when ethanol-fueled vehicles are expected to be widely available in the United States. He simulated atmospheric conditions nationwide, but focused on Los Angeles because it “has historically been the most polluted airshed in the U.S., the testbed for nearly all U.S. air pollution regulation and home to about 6 percent of the U.S. population,” he wrote. He compared the effects of gasoline-fueled vehicles to those fueled by E85, a popular blend of 85 percent ethanol and 15 percent gasoline. “We found that E85 vehicles reduce atmospheric levels of two carcinogens, benzene and butadiene, but increase two others – formaldehyde and acetaldehyde,” Jacobson said. “As a result, cancer rates for E85 are likely to be similar to those for gasoline. However, in some parts of the country, E85 significantly increased ozone, a prime ingredient of smog.”

Inhaling ozone can decrease lung capacity, inflame the lungs, worsen asthma and impair the immune system, according to the U.S. Environmental Protection Agency. The World Health Organization estimates that 800,000 people die yearly from ozone and other chemicals in smog. “In our study, E85 increased ozone-related mortalities in the United States by about 200 deaths per year compared to gasoline, with about 120 of those deaths occurring in Los Angeles,” Jacobson said. “These mortality rates represent an increase of about 4 percent in the U.S. and 9 percent in Los Angeles above the projected ozone-related death rates for gasoline-fueled

vehicles.” Ozone increases in Los Angeles and the northeastern United States will be partially offset by decreases in the southeast, the study found. But “nationwide, E85 is likely to increase the annual number of asthma-related emergency room visits by 770 and the number of respiratory-related hospitalizations by 990,” Jacobson said. “Los Angeles can expect 650 more hospitalizations in 2020, along with 1,200 additional asthma-related emergency visits.”

“There are alternatives, such as battery-electric, plug-in-hybrid and hydrogen-fuel cell vehicles, whose energy can be derived from wind or solar power,” he added. “These vehicles produce virtually no toxic emissions or greenhouse gases and cause very little disruption to the land.”

2. Global warming could shorten day

May 7, 2007

Special to World Science

Source: (<http://www.world-science.net/>)



An ethanol plant converts corn to ethanol, a form of alcohol that has been proposed as a clean alternative to gasoline. (Image courtesy: U.S. Nat'l Renewable Energy Laboratory).

Earth's familiar 24-hour day may become about 12 hundred-thousandths of a second shorter due to the long-term trend of global warming, a new report contends.

Alongside various environmental disasters that scientist predict will ensue from global warming – believed to be caused by emissions of heat-trapping gases due to human activities – another effect would be a redistribution of Earth's water. This would occur because of changes in

water temperatures. Felix W. Landerer of the Max Planck Institute for Meteorology in Hamburg, Germany, and colleagues calculated the effects of this redistribution on the Earth's spin. This in turn determines the length of the day.

If an appreciable amount of the weight of ocean waters redistributes itself toward the poles, this reduces the extent to which the planet as a whole bulges at the equator. This then results in something similar to what happens when a spinning



skater pulls her arms in toward herself: the spin speeds up. Earth may witness an analogous effect, Landerer and colleagues reported in a paper published March 28 in the journal *Geophysical Research Letters*. The effect occurs because a rise in ocean temperatures would raise sea levels, the scientists explained. A considerable amount of ocean mass may transfer away from deep waters to shallower continental shelves, the seabeds that surround continents. In addition, "the continental configuration is such that there is a lot of shelf area especially in the higher northern latitudes," near the North Pole, Landerer wrote in an email. Thus, a movement toward shelf areas means a movement toward Earth's axis of rotation, and away from the equator.

By the end of the next century, enough water mass could shift to shorten the length of day by about 0.12 thousandths of a second, Landerer's team predicted. They based their calculations on future ocean conditions predicted by the Intergovernmental Panel on Climate Change Fourth Assessment.

3. Southern Ocean saturated with CO₂

May 17, 2007

Deborah Zabarenko, Environment Correspondent – Reuters

<http://www.reuters.com/article/worldNews/idUSN1623079520070517>

The Southern Ocean around Antarctica is so loaded with carbon dioxide that it can barely absorb any more, so more of the gas will stay in the atmosphere to warm up the planet, scientists reported on Thursday the 17th May.

Human activity is the main culprit, said researcher Corinne Le Quere of the Max Planck Institut fur Biogeochemie, in Germany, who called the finding very alarming. The phenomenon wasn't expected to be apparent for decades, Le Quere said. "We thought we would be able to detect these only the second half of this century, say 2050 or so," she said. But data from 1981 through 2004 show the sink is already full of carbon dioxide. "So I find this really quite alarming."

The Southern Ocean is one of the world's biggest reservoirs of carbon, known as a carbon sink. When carbon is in a sink – whether it's an ocean or a forest, both of which can lock up carbon dioxide – it stays out of the atmosphere and does not contribute to global warming.

The new research, published in the latest edition of the journal *Science*, indicates that the Southern Ocean has been saturated with carbon dioxide at least since the 1980s. This is significant because the Southern Ocean accounts for 15% of the global carbon sink, Le Quere said.

Increased winds over the last half-century are to blame for the change, Le Quere said. These winds blend the carbon dioxide throughout the Southern Ocean, mixing the naturally occurring carbon that usually stays deep down with the human-caused carbon. When natural carbon is brought up to the surface by the winds, it is harder for the Southern Ocean to accommodate more human-generated carbon, which comes from factories, coal-fired power plants and petroleum-powered motor vehicle exhaust.

The winds themselves are caused by two separate human factors. First, the human-spawned ozone depletion in the upper atmosphere over the Southern Ocean has created large changes in temperature throughout the atmosphere. Second, the uneven nature of global warming has produced higher temperatures in the northern parts of the world than in the south, which has also made the winds accelerate in the Southern Ocean.

"Since the beginning of the industrial revolution the world's oceans have absorbed about a quarter of the 500 gigatons (500 billion tons) of carbon emitted into the atmosphere by humans," Chris Rapley of the British Antarctic Survey said in a statement. "The possibility that in a warmer world the Southern Ocean – the strongest ocean sink – is weakening is a cause for concern," Rapley said.

Another sign of warming in the Antarctic was reported on Tuesday 15th May by NASA, which found vast areas of snow melted on the southern continent in 2005 in a process that may accelerate invisible melting deep beneath the surface.



Featured Article

Kelp comes into the mainstream

Ecklonia maxima, *Fucus vesiculosus* and carrageenan: these are listed on many health products in South Africa, such as vaginal creams, sexual stimulants and skin care lotions. But these ingredients are still somewhat mysterious and their mechanisms of actions not fully understood. They are seaweeds and extracts of seaweeds found worldwide in cold-water currents. They are part of thalassotherapy (from the Greek word for the sea), the umbrella term for treatments that use seawater and seaweed to improve the condition of the skin and body. *Ecklonia maxima* is the name for the brown kelp found in South Africa's west coast waters; *Fucus vesiculosus* is the term used for a species of wrack from the North Atlantic kelp that goes under many names including Bladder Wrack and Norwegian Kelp; carrageenan is a gelatinous extract from a range of red seaweeds with many uses including in personal lubricants and foods – from ice cream and beer to processed meats.

Health products derived from kelp and other seaweeds (macro-algae) have been popular for centuries in such countries as China and Japan. But how effective are they? To find conclusive evidence various institutions have embarked on chemical analysis and other research, among them the University of Maryland Eastern Shore in the US. The university recently announced a four-year interdisciplinary study between the departments of natural sciences and human ecology and the food science and technology doctoral programme, funded by the US agriculture department, to study the properties of edible seaweeds and the effect on waterways, health, nutrition and aqua-

farming. Dr Madhumi Mitra in the university's Department of Natural Sciences, heads the project. Mitra says the team is interested in expanding its research to other countries and establishing a global network. Some medical research and clinical trials have been conducted into the health benefits of kelp. Two studies published in 2005 by researchers at the University of California, Berkeley, found a diet containing brown kelp seaweed (*Fucus vesiculosus*) lowered levels of the potent sex hormone estradiol in rats and in women with abnormal menses. The kelp corrected the abnormal menstrual cycles. This has raised hopes that brown kelp seaweed might decrease the risk of oestrogen-dependent diseases such as breast cancer in humans.

Kelp and seaweed extracts are appearing in an increasing number of health products. But how effective are they for remedying health ailments? New research into kelp and seaweed may hold answers.

Celeste Naude, a dietician at the Nutrition Information Centre at the University of Stellenbosch, South Africa, says humans have eaten seaweed for millennia and now extracts from these

macro-algae are being incorporated into a wide variety of nutritional supplements and preparations. "Despite a significant range of claims for seaweed extracts, no sound and consistent scientific research in humans is available," says Naude. "Questions still remain about the efficacy, benefits, side-effects, dosages and interactions with other medications, as well as other safety aspects of supplements and products containing seaweed extracts."

There have been cases of potential arsenic poisoning from contaminated kelp (seawater contains highly dilute arsenic, but kelp can concentrate arsenic in its tissues). Other cases reported include impaired fertility and of an increased risk of thyroid cancer and stomach aches from carrageenan. In Asian cultures kelp and seaweeds are popular for their nutritional and



The large brown seaweed, *Ecklonia maxima*, is proving to be of huge economic benefit for South Africa. (photo: GW Maneveldt)



medicinal properties. They have been used to treat uterine problems, genital tract disorders, bladder and prostate ailments. The Japanese – the largest consumers of kelp – use it in salads, soups, sauces, cakes and noodles and as rolls (or maki-sushi) wrapped in nori seaweed.

Treatments using kelp and seaweed extracts have proliferated in the west for health conditions from tuberculosis, arthritis, colds and flu to improved muscle recovery after exercise. Some people use it for shiny and thicker hair. In South Africa, kelp, which is mainly used as a nutrient-rich food supplement and for thyroid ailments because of its high iodine content, has been hailed for its wonder properties, as many new products have burst onto the market. They include Vagpen Cleaner, a syringa/kelp-based lotion that is a lubricant to protect against vaginal infections. John Morris, MD of Syringa Bioscience, says: “Kelp has antifungal properties and growth regulators that help the mucous restoration in the vagina’s walls and is itself a bactericide.” Iqawe, meaning “warrior” or “strong” in Xhosa, is a herbal complex of Asian, African and South American traditional medicines containing *Fucus vesiculosus* (a wrack) from the North Atlantic to boost sexual performance. Thyroid Assist contains *Fucus vesiculosus* among its ingredients to address thyroid health. Kim Black, health consultant at Feelgood Health, manufacturer of Iqawe and Thyroid Assist, says their kelp-based slimming products for adults and teenagers have also taken off. Michele Carelse, formulator of the Feelgood Health remedies, says it is important to ensure that any kelp-based supplements contain only kelp sourced from areas free of heavy metal contaminants and other pollution. “All our kelp raw materials are laboratory tested to ensure that they are free of harmful contaminants such as heavy metals, including mercury.” Kelp harvested from the west coast of South Africa is included in a new range of skincare products called Algaeron. “Seaweed influences cell multiplication because of its mass growth substances such as vitamins, trace elements, increased chlorophyll syntheses, photosynthesis and the regulation of food elements,” says Trevor McCauley, MD of Algaeron. Nautilus Mineral Waters in the US recently launched a premium spring water, called PhytoWater, containing Pacific kelp extract and

plant sterols to help lower cholesterol. Danish company Jens Moller has introduced Cavi-Art, a caviar substitute made from seaweed for those on low cholesterol and vegetarian diets.



The new “Algaeron” skin-care range is manufactured from extracts of *Eklonia maxima*.

Until more research proves the health-giving properties of kelp and seaweed, consumers will need to be wary about some claims of its effectiveness. Yet more research is likely with increased interest in these nutrient-rich macroalgae from the ocean’s depths. Andrea du Plessis, a Vital Health Foods nutritionist in South Africa, says more research would help. “Kelp has complex compounds such as polyphenols, considered antioxidants that can help to reduce free radicals in our polluted environments. Different elements in kelp could target specific health problems.” The experts say that before using kelp, people with high blood pressure or a history of thyroid problems should consult their doctor. Kelp is not recommended for low-sodium diets.

Chesney Bradshaw

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Conference Countdown

The 23rd Congress of the Phycological Society of Southern Africa has been proposed for the 15-18 January 2008 and is to be held at Rocky Bay on the south coast of KwaZulu-Natal, a 30-minute drive from Durban.

The venue, [Ellingham Resorts](#) is situated within walking distance of the beach and accommodation is in log cabins. The conference venue is air-conditioned. All meals will be provided by the on site restaurant, the Bell and Anchor.

The conference will take the form of 20-minute oral presentations, a poster session and a field trip organized by Dr A.J. Smit. The invited speaker is Dr. N.S. Yokoya from the Institute of Botany, São Paulo, Brazil. See the society's website for further details.

Calendar of Events

Upcoming Conferences

1. 5th WIOMSA Symposium. Durban, RSA, 22-26 October 2007.
<http://www.ori.org.za/wiomsa5>
2. 8th Conference of the Aquaculture Association of Southern Africa. Cape Town, RSA, 22-26 October 2007. <http://www.aasa-aqua.co.za>
3. 11th Congress of the International Society for Applied Phycology (ISAP). Galway, Ireland, 21-27 June 2008.
Email: stefan.kraan@nuigalway.ie
4. South African Marine Science Symposium (SAMSS) 2008. Cape Town, RSA, 30 June - 3 July 2008. Email: annette@nrf.ac.za
5. 5th Asian Pacific Phycological Forum (APPF). Wellington, New Zealand, 10-14 November 2008. Email: appfinquiries@niwa.co.nz



How angling will spawn a crisis

THERE is an “enormous” amount of scientific research that supports keeping the Tsitsikamma National Park and its associated marine protected area as a “no-take” zone, where all fishing is banned.

Marine research in the park has been done by Rhodes University’s Department of Ichthyology and Fisheries Science, the SA Institute of Aquatic Biodiversity, Port Elizabeth Museum, SA National Parks’ scientific services, and the Marine and Coastal Management branch of the Department of Environmental Affairs and Tourism.

One of the principles established by this and research elsewhere is that fish should not be exploited throughout their range. Rather, a substantial proportion of the population of each species – as much as 20% to 30% – should be protected, to conserve broodstock. This is because the older fish contribute disproportionately more to the spawning capacity of that species’ population. Younger fish cannot match the egg production of the older fish.

Fishing depletes the abundance of these older, more fertile fish rapidly by removing fish before they have reached this age, thereby drastically reducing the egg-production capacity.

In contrast, marine protected areas like the one at Tsitsikamma, where there is no fishing, provide a refuge where fish can live longer and become fertile.

A large number of South

Environment Writer

African fish populations have collapsed because of fishing pressure – particularly, but not exclusively, reef species, many of which are found at Tsitsikamma.

Reef species usually live for longer than 30 years, but only become sexually mature at an advanced age. If they are caught while young they never get a chance to spawn.

The spawning capacity of most South African linefish species is now just 10% of its historical level, and some have been reduced to less than 5%.

A senior aquatic scientist at the SA Institute of Aquatic Biodiversity in Grahamstown, Paul Cowley, who has been monitoring fish populations at Tsitsikamma for a decade, says they know fish abundance will decline there if it is opened to recreational fishing.

“Opening this area will set a precedent that is not sustainable.”

Cowley pointed out that of 7 500 fish caught and tagged in a 4km-long research area in the park, 98% of all fish caught again had been in the same area, and most at the same fishing site.

More than 30% of all the tagged Red Roman, one of the most resident of all reef fish species, had been caught again.

“It’s clear and obvious – all the larger and older resident fish will be taken out if this area is opened up to fishing,” Cowley said.