

Fish 'N' Chips

A Monthly Marine Newsletter
July 2005 Issue

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From Liz

By Elizabeth M. Lukan 7/28/05

Old Mindspring Addy: My old Mindspring email address - fishnchips@mindspring.com - has been deleted. All I get at that address now is SPAM anyway. If you need to email me, visit <http://www.marinefiends.com/emails.html>.

Visit This Month's Subscriber's Tank Showcase: Cedric C. Kirkman's 10 Gallon Reef Tank is this month's Showcase and can be seen at <http://www.marinefiends.com/showcases.html>. To submit your tank photos, visit <http://www.marinefiends.com/submittank.html> (*updated 10/12/05*).

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Critter Corner

Coral Propagation

By Brad Birch

Edited By Elizabeth M. Lukan, 7/27/05

With increases in the number of reef aquarium hobbyists over the past 20 years, there has become an increased pressure on the natural reefs around the world. The big demand for stony

corals and soft corals by reef aquarium hobbyists have led to the partial destruction of some natural reefs. Due to this, many coral suppliers have been making these corals more available for sale to hobbyists. One of my main personal concerns is that many of these corals will die in transport and some of the remaining will die during the assimilation process to our aquariums. Many hobbyists are surprised to learn that up to 80% of the corals harvested will die during collection, storage, en-route, or adjusting to our tanks.

While the world's reefs are a renewable resource, it appears that they may not be able to keep up with demand by hobbyists. In the near future this may indeed lead to regulations on coral imports. This of course would be a major blow to reef aquarium enthusiasts as the price increases and availability of the corals we wish to keep becomes more difficult to obtain.

The hobbyist solution to this problem is to propagate (via fragmentation) the corals they already have. If successful, we can increase our stock and diversity through sale and trade. In addition, we can learn much about the needs and characteristics of the corals we keep, by observing these fragments. In addition, as some have found, fragmented corals tend to adjust better and faster to our aquariums with fewer losses.

I feel it is of great importance as well as a pleasure to fragment the corals I own. With this article, I hope to share some of my experiences and possibly encourage others in the hobby to fragment their own corals.

After having successfully kept a reef aquarium for several years, I had decided to try coral fragmentation. I already had a reef system full of thriving stony corals including many Small Polyp Scleractinian (SPS) types with most of these from the genus *Acropora*, which I knew were being fragmented by others. The question of course is how were they being fragmented? What special tools or techniques were being used? I needed to do some studying before attempting this task.

I began my research into fragmentation by visiting the Geothermal Aquaculture Research Foundation (GARF) Coral Propagation Lab web site. Here I found a wealth of information on stony coral fragmentation based on research done by the GARF folks. I felt I could apply their recommendations to my corals and so began several trials. After success with these I began to fragment SPS corals in larger numbers and now I have also fragmented several Large Polyp Scleractinian (LPS) corals including the Trumpet Coral (*Caulastrea echinulata*) and Frogspawn (*Euphyllia paradivisa*). The end result has been to generate more information by experience and to increase my stock of corals. In addition I have traded many coral fragments and grow-outs with fellow hobbyist, and sold some to a LFS, which helps defray the cost of running the reef system. In any event, I have reduced the pressure on the natural reefs by making a second source available.

Terminology

There are a few terms that need definition before we can proceed. Some terms may be in dispute amongst knowledgeable hobbyists but will do for this article.

Host

This is the coral colony that a cutting or fragment comes from. They are often first generation but may be of any generation.

Cutting/Fragment

This is a piece of a coral that has been separated from the host and usually contains a small fragment of skeleton and tissue.

Plug

A cutting that has been attached to a rock or other base.

First Generation

This refers to the line of secession for a fragment or cutting. A first generation cutting comes from a coral colony that was taken from the natural reef.

Second Generation

This refers to a cutting from a first generation coral.

Grow-Out

This refers to the process of growing a colony from a cutting or fragment. This process can take some time and results in a non-first generation coral colony.

Attached Cutting

This refers to a coral fragment or cutting that has been attached to some kind of base (like a piece of live rock).

Encrustation

This is a distinction made between tissue growth at the branches of a coral and at the base. The base tissue growth will be referred to as encrustation growth.

Preparations

Before we can begin the fragmenting of corals it is necessary to have a good foundation for coral growth. This means an established reef tank with stable parameters and a history of successful and preferably rapid coral growth. It will not be possible to fragment stony corals if the hosts themselves can not grow well.

Most experienced hobbyist knows the general requirements for a well kept reef aquarium. There are two though that I feel I need to emphasize for coral fragments. The first is lighting. I have found that the fragments seem to need at least as much, if not more, light than the host does, to insure good recovery and early growth rates. The fragments also do well with increased actinic blue lighting (light with a wavelength of around 430 nm). Therefore, it may be necessary to put the grow-out fragments nearer the light source or even add additional actinic light for faster growth. This is particularly true of *Acropora sp.*, which will need a great deal of light energy to rapidly encrust at the base. In short, I have never had a grow-out do poorly because of too much light!

The second requirement for stony coral growth is good water flow. I prefer a pulsed or wave action, if possible, and this can be done by use of a wave maker or surge system. I have found that attached cuttings grow better with this type of water motion as it is more efficient at removing waste products and stimulating the important base encrustation process.

Fragmentation also requires a healthy growing host colony. This is important because we cannot expect the cuttings from an ill host to do well. I recommend that a newly acquired first generation host be assimilated for at least several months before any attempt is made to make cuttings from it. Even then, the coral should show signs of either encrusting or branching growth or the polyps should show signs of extension. If you plan on fragmenting a branching LPS (like Trumpet or Frogspawn) I would recommend that you wait until you notice polyp division occurring. This is a sign of good growth and so the cuttings are sure to divide as well.

The Grow-Out Tank

Some advanced hobbyists are using grow-out tanks to provide a more controlled environment for their fragments. These tanks provide the same high quality water parameters and low nutrient levels of their main tanks but do not contain any coral predators or irritants such as snails or algae. The tank design allows the hobbyist to work with the coral grow-outs without having to reach around host colonies or find suitable locations for mounting. There is more flexibility as to lighting and water movement and greater ease for target feeding of the corals.

There are a lot of good reasons to set up a grow-out tank and the hobbyist who does will be rewarded for the effort with increased growth rates and reduced losses. The down side of

course is that it will require some effort, time and money to put one together. If you plan on doing a lot of grow-outs, I would definitely recommend a dedicated grow-out tank. If you plan to just make several cuttings or are just starting to experiment with fragmentation, I would recommend that you just put the grow-outs in your main tank. This in fact is what I have been doing with great success for almost a year. In other words, there is no requirement for a grow-out tank to successfully fragment corals, but it does offer advantages.

There are basically two configurations for a grow-out tank. The first is the attached tank. This is a tank that is plumbed to the main system (usually through the sump) and so uses the same water as the display tank. The second is the detached grow-out tank and is a self-contained system. There are advantages and disadvantages to both systems.

The advantage to the attached system is that the grow-out tank will have a larger system-wide water volume with the same water parameters as the display tanks. The disadvantage is that any problem that shows up in the display tank system (from parasites to poor water quality) will be reflected in the grow-out tank. In addition, because of the plumbing, it may be difficult to find an appropriate place for the attached tank.

The advantage of a detached grow-out tank is the flexibility in its location. It could be in a different building if needed! The big disadvantage is lack of system water volume with all the negatives that implies. Also, there is a greater start-up cost due to additional equipment (like protein skimmer).

Regardless of the configuration, the grow-out tank can be made of any reef safe material and does not have to be the traditional glass aquarium. There is no imperative to be able to see in from the front or sides so plastic, wood or concrete will serve.

It is best that the tank have a large surface area and does not need much depth. This is so more corals can be put in without running the risk of neighbors stinging each other. The tank can be outfitted with racks made of egg crate to help segregate corals of different types and light needs. A grid can be made of nylon string to help monitor growth rates. In short the grow-out tank can be designed to meet your grow-out needs without paying attention to appearances.

There is no need for any live rock or other similar substrate if you have an attached tank, as all of the bio filtering will be done by the display tank. The unattached tank may need more thought in this regard though. It is unclear how successful a 'sterile' grow-out tank would be. I would recommend some kind of bio-filter and the facility to add carbon.

Lighting would be of a type and magnitude for good coral growth. This would be similar to the display tank lighting. Water movement would be done through a surge or wave maker device.

Asexual Fragmentation

Before going into man-made fragmentation techniques, I want to look at several techniques the corals themselves have for asexual fragmentation. There are five ways for stony corals to asexually reproduce:

Polyp Balls

The coral creates a 'bud' containing a tumor-like sac of tissue and a small fragment of skeleton. This develops over time and due to its weight, will drop off and become an independent coral.

Fragmenting branching corals

Corals like *Acropora* and *Hydnophora sp.* may have branches broken off by any number of causes. Corals with thick tissue (*Hydnophora sp.*) can sometimes have the skeleton break with the tissue still attached. In time the tissue will degenerate and the fragment will let go from the host. The fallen fragment is not dead and will, in time, begin to encrust to the surfaces it is contacting, forming a new coral. Hobbyists take advantage of this form of asexual reproduction to fragment these corals.

Fission

Some corals (esp. mushroom corals from the family Fungiidae) are able to split into two or more colonies during the early stages of their development.

Polyp Bail-Out

In certain situations (usually stress), some stony corals like *S. hystrix* and *P. damicornis* may release single polyps. These will drift to new locations where they settle and can form new colonies.

Brooders

Asexually brooded planula larvae may be developed by a kind of budding.

SPS Coral Fragmentation

I have fragmented several SPS type corals over the past year and have found the process to be both simple and rewarding. The tools required are nothing more than a pair of diagonal cutters, a tube of Super Glue Gel and some small pieces of live rock rubble.

Though I know some do this, it seems risky in that the host usually is not given time to adjust

and start growing before the cuttings are taken. One also loses the sense of husbandry while watching the small attached fragments become full coral colonies. In addition, there may be benefits to the grow-out coral when compared to the fragments. It appears that the growing second (or more) generation corals adapts to the high DOC and NO₃ levels in the system and may be better suited for trading or selling to a new reef aquarium. In general, I have found that the longer the grow-out period, the greater success the coral will have when transported to another aquarium. So I would recommend that attached SPS coral fragments be allowed to grow-out in the same aquarium (or an attached grow-out tank) as the host for 6-9 months before being traded or sold. At a minimum, the coral should have good encrusting growth (enough to cover the glue at the base) and at least a few branches started before sending to a new home.

As I commented before, it is very important to have a stable, mature, reef system before attempting to fragment corals. This is necessary, as coral fragments seem to be more sensitive to changing water conditions than the host. In addition, mature aquariums are more likely to have some amount of phytoplankton and other water born nutrients for the polyps to feed on.

The best measure of tank readiness is continued healthy and fast growth of the host corals.

Summary of SPS Fragmentation

Ross or Loctite Super Glue Gel's (containing Cyanocrylate) will do fine. In fact, the whole process only took about 15 minutes to do.

Make sure the host is healthy, adjusted and growing well before attempting to fragment.

Think about putting together a grow-out tank if you plan on doing a lot of fragmentation.

Use surgical gloves when handling the cuttings or host. Make sure to rinse off any chemical powder residues that may or may not be present in or on the surgical gloves.

Handle the fragments with light pressure as not to damage the corallite walls.

Take cuttings from lower branches since these generally receive less light due to shading of upper branches and, if left on the host, will most likely die in time anyway.

I have found that for *S. hystrix*, the small single branch fragments did poorly. All had tissue death from the base up in one week. Make cuttings with at least two branches.

Use small pieces of live rock with coralline algae on them for best grow-out appearance.

Put several fragments of the same species on one rock to increase the grow-out colony density.

For *Acropora sp.* with fast growing branches, attach the fragment sideways or horizontally to the base of rock. This will increase the encrusting area and will allow a more natural look to the grow-out.

For increased support, bore holes in the rock or base then glue the cuttings into the holes. This is particularly important for corals that do not have aggressive encrusting growth.

Allow the super glue to set over night with the attached cutting located in a quiet place in the sump.

When putting the attached cutting into the tank, be sure to secure the live rock with epoxy putty for long term stability.

For those of you interested in fragmenting your own corals, I hope that this article has helped you in making your decision on whether you want to fragment your own corals or not. Happy coral fragmenting!

References:

Coral Fragmentation: Not Just for Beginners by Anthony Calfo (<http://www.reefkeeping.com/issues/2002-06/ac/feature/>).

Book of Coral Propagation Volume One by Anthony Rosario Calfo (<http://www.amazon.com/exec/obidos/ASIN/0971637105/coralforumsal-20>). *Editor's Note:* This is an Amazon.com Affiliate Link for the author.

Editor's Comments:

Editing was limited to spelling corrections and some grammar (capitalizing the beginning of a sentence, adding a period at the end, etc.). No other editing was done, what you read was exactly what was sent to me.

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Caught In The Net

By Elizabeth M. Lukan 7/21/05

New Stuff Found

Advanced Aquarist's Online Magazine (<http://www.advancedaquarist.com/>):

- Volume IV, Issue VII, July 2005 - <http://www.advancedaquarist.com/2005/7>

SeaScope Magazine (http://www.marineland.com/news_seascope.asp):

- Volume 22, Issue 1, 2005 - http://www.marineland.com/seascope/SSISSUE1_05.pdf

Marine Aquarium Council Update

First Quarter 2005

Director's Note

The MAC News for the 4th Quarter of 2004 had already been finalized before the devastating tsunami of 26 December occurred. Fortunately, the immediate crisis and its aftermath have been, and continue to be, responded to with support for disaster relief and rebuilding. Although the images of the tragedy are fading from media attention and public view, it is important to keep in mind the relationship of the marine aquarium trade and hobby with the reefs, fisheries, collectors and communities in these areas - and similar areas in other developing countries with coral reefs.

Coastal villagers in developing tropical countries, such as those affected by the tsunami, often survive in difficult, sometimes very marginal, living conditions. Ensuring that the marine aquarium fishery is responsible, safe and economically viable can be an important part of ensuring fishers and their families in these areas have sustainable livelihoods based on environmentally sound income generation. A marine aquarium trade based on sustainable use and conservation is also important in maintaining the health and functioning of coral reefs. Healthy coral reefs not only sustain a responsible marine ornamental fishery, and other well-managed subsistence or commercial use of renewable resources, but they are also critical in building beaches and buffering coastal areas from the impacts of the storm waves, hurricanes and tsunamis, as was seen in the events of December 2004.

A sustainable trade and responsible hobby can provide incentives for maintaining healthy reefs and value-added fisheries that are important to the viability of the kinds of tropical coastal communities that became so well known to the world at the beginning of 2005. MAC is working with the marine ornamentals industry and hobby to respond to the challenges and opportunities that this presents. MAC programs, such as the Marine Aquarium Market Transformation Initiative (MAMTI) described below, focus on building the capacity of communities and collectors in the Philippines and Indonesia that supply so many of the marine ornamentals in trade.

Communications and Education

MAC Ad and Article Series Continues in Tropical Fish Hobbyist

The productive relationship between MAC and Tropical Fish Hobbyist (TFH) magazine has continued with the series of quarterly ads featuring statements and photos from renowned marine aquarium keeping experts, and the series of quarterly articles related to MAC.

The full-page ads, in space donated by TFH, are centred on the theme "Healthy Reefs, Healthy Fish, Healthy Hobby" and have featured photography and the following quotes by J. Charles Delbeek, Julian Sprung and Martin Moe:

- J. Charles Delbeek: "As marine aquarists, it is our responsibility to ensure that our hobby conserves the reef ecosystems that provide us with many of the animals for our aquariums. We can do this by supporting the Marine Aquarium Council (MAC) and the suppliers of MAC Certified organisms." (TFH, September, 2004)
- Julian Sprung: "People involved in the marine aquarium hobby, reef aquarium keepers in particular, are very conscious of the natural environment and concerned about how their hobby might affect it. Our hobby has the potential to protect areas of wild habitat when the economic incentive of a thriving fishing industry is matched with a conservation ethic that promotes the use of environmentally sustainable harvest practices. Your support of the Marine Aquarium Council promotes this positive relationship." (TFH, January, 2005)
- Martin Moe: "The hobby of keeping marine life in home aquariums teaches us many things. It gives us insight into the beauty and incredible biological diversity of the coral reef environment. It teaches us about the fragility and complexity of life in the sea, and above all, it inspires our

respect and admiration and creates a desire to protect and preserve these wellsprings of aquatic life. But how can we be a part of the solution to the problems that beset our coral reefs and not contribute to the immense problems that face these fragile environments? The Marine Aquarium Council has taken on this daunting task and deserves our support and encouragement. The future of our hobby depends on it." (TFH, April, 2005)

Public Aquarium Resource Kit Available, with Video Featuring "Voice of Nemo"

The MAC Public Aquarium Resource Kit CD with resource tools to use in raising public, hobbyist and industry awareness about issues in the marine ornamentals trade and the benefits of MAC Certified marine aquarium organisms is available. The kit includes seven exhibit panels in high resolution pdfs. Also on the CD are: the MAC hobbyist brochure in five languages, the MAC card on responsible aquarium keeping, photo image examples from the MAC photo library, the MAC Certified example label, a special web version of the MAC logo for cross-linking purposes, two camera-ready ads, lesson plans, the 8-page MAC booklet for industry in five languages, the MAC booklet for hobbyist and selected fact sheets and FAQs. The Resource Kit CD also contains mpeg4 versions of the MAC 5-minute and 60-second public service announcements that feature Alexander Gould, the voice of Nemo in Finding Nemo. The PSAs summarize the marine ornamentals collection and trade story from Reef to Retail and encourage a responsible hobby through MAC Certification. Please contact info@aquariumcouncil.org to obtain a copy of the CD.

Indonesia and Philippines Update

Marine Aquarium Market Transformation Initiative (MAMTI) Program Begins

In early 2005, following nearly three years of efforts, MAC and key partners have achieved support for MAC Certification and supply development work in the Philippines and Indonesia from the Global Environment Facility (GEF), an inter-governmental program of the World Bank, UN Development Fund (UNDP) and UN Environment Program (UNEP) for addressing global issues, including biodiversity conservation. The MAC project is entitled the "Marine Aquarium Market Transformation Initiative (MAMTI)" and will be implemented through a partnership of MAC, Reef Check and the Conservation and Community Investment Forum (CCIF), under the guidance of the International Finance

Corporation (IFC) of the World Bank. The MAMTI project provides GEF support of USD 6.6 million over 5 years in Indonesia and the Philippines.

MAMTI expands on MAC's existing efforts in these countries. The program will provide capacity building for marine ornamentals collectors to become certified and to improve their business skills and the development and operation of their small enterprises and cooperatives. Capacity building and training is also undertaken with community stakeholders, assisting them to work with collectors and other stakeholders to develop and implement certified ecosystem management plans. As part of the latter, scientific assessment and monitoring of the collection areas will be conducted, contributing to management planning to ensure the health of harvest areas through marine protected areas and reef rehabilitation.

Indonesian Collectors and Exporters Prepare for Assessment

In Indonesia, a group of collectors and exporters have been preparing for the first-ever "pre-assessment" leading up to plans for a formal Certifier visit. As such, everyone is feeling a little nervous and wondering: How strict will the assessors be? What will they ask? Some outsiders express the opinion that Indonesia may be too backward or corrupt for certification to work. Others say that if collectors and exporters in the Philippines - a country not too dissimilar from Indonesia in many ways - can become certified, then achieving certified status is certainly possible in Indonesia as well. There are also concerns due to the language barriers, high costs of importing even basic equipment, and the huge distances between collection areas within the country.

There are already reports from some exporters that the quality of ornamental fish from collectors and suppliers involved in MAC's training program has improved significantly. These small but important changes are showing that the situation can and will improve with targeted efforts. Indications are that the certification of the first few exporters and the people who supply them is likely to have a significant positive impact on the trade in Indonesia. Once MAC Certified marine organisms start entering the market from Indonesia, it will be clear that the issues of destructive collection practices, high mortality rates, dive-related injuries and poorly trained and equipped collectors can be dealt with.

Indonesian Collectors Actively Manage and Protect Their Reefs

Capacity building for collectors to help them understand coral reef issues, reef

management and how to form collectors cooperatives has helped collectors to take a more active role in managing their reefs. Representatives of the collectors attended the first Collection Area Management Plan (CAMP) meeting at Pejarakan village of North Bali in January. The purpose of the meeting was to ensure that the collectors group reviewed and revised the CAMP document, which they subsequently brought into the village meeting in February. During this meeting, the collectors discussed the management plan with village representatives, and identified proposed no-take areas within the CAMP.

Capacity building for collectors in reef management has also helped them to take a more active role in protecting their reefs in very practical ways. The coral reefs of the Pejarakan collection areas were hit by an outbreak of the coral eating Crown-of-thorns starfish (COT), *Acanthaster planci*, that can decimate live coral cover. The collectors group, consisting of more than 30 fishermen, conducted a clean-up action to try to prevent further outbreaks of COT. The fishermen gathered over 3000 COTs off the reef, took them ashore and buried them as part of the management effort to protect the health of the reef areas harvested by the collectors.

Pacific Update

Improvements in Live Rock Assessment and Management Under Development

The MAC Pacific team is working with the industry, communities and other stakeholders in Fiji to develop and test improved methods for assessing live rock resources, creating management plans for collection areas and managing live rock extraction practices, following on from Fiji workshops on the coral and live rock trade in 2004. They conducted the initial research by familiarizing themselves with the techniques of live rock collection, observing village collectors and interviewing collectors on their expertise in identifying the collectable live rock. In the second step, the live rock was examined, weighed and categorized after it had been delivered to a facility for screening and curing before export.

MAC participated in several multi-stakeholder workshops that were conducted to develop improvements to methods for assessing and managing live rock. A first comprehensive live rock assessment using the revised methods was carried out at a collection site along the Viti Levu coast near Suva, Fiji in partnership with the company operating in that area, Water Life Exporters Fiji Ltd (WEF) and with active involvement of the company and enthusiastic assistance from the

collectors in the community. The assessment was designed to provide baseline Information as a requirement for the development of a Collection Area Management Plan (CAMP), initiate MAQTRAC monitoring with recommendations for an on-going Monitoring Assessment and improve the site-based resource management of live rock collection.

Canadian Supported Pacific Marine Ornamental Certification Project comes to a close

The Marine Ornamentals Certification project, funded by the Canadian-South Pacific Ocean Development program, administered by the South Pacific Forum Secretariat and implemented by MAC, came towards the end of its project cycle in late 2004. Through the generous support of the Canadian government significant progress has been made in beginning to harness market forces to transform the marine ornamentals industry in the four targeted Forum Island countries of Fiji, Solomon Islands, Cook Islands and Vanuatu into one based on quality and sustainable use of coral reefs. The project achieved greatest success in Fiji where all five marine ornamentals companies have signed the MAC Statement of Commitment. One of the companies had been MAC Certified and another is very close to achieving MAC Certification. Three other companies in Fiji are committed to becoming certified and have made, to varying degrees, substantial efforts towards this. In Vanuatu, Cook Islands, and Solomon Islands, all operating companies in each country also signed the MAC Statement of Commitment and/or made similar levels of progress towards certification. MAC continues to work with these Pacific countries, and others, to the extent that resources are available and there is interest on the part of the companies.

North America and Europe Update

Sea Dwelling Creatures becomes MAC Certified Importer

In March 2003, Sea Dwelling Creatures (SDC) achieved MAC Certified status following assessment by the MAC Accredited certifier Shizen Megumi Pacific Certification Services Ltd. The certification of Los Angeles-based SDC raises the number of wholesale facilities in the North America that meet the MAC Standards to five importers. As always, please check the "Stay Updated" section on the MAC homepage at <http://www.aquariumcouncil.org/> for the only official and up-to-date listing of MAC Certified suppliers.

MAC at Global Pet Expo in Orlando

John Brandt, MAC Board member, represented MAC at the new Global Pet Expo (March 13-15, Orlando, Florida) and staffed the MAC booth. In a show of support for MAC, booth space was provided by the show's organizers American Pet Products Manufacturers Association (APPMA) and the Pet Industry Distributors Association (PIDA).

Pet Industry Stresses the Need for Voluntary Performance Standards

In the discussion on 'Trends and issues that may affect the industry in 2005' (Pet Product News, January, 2005), Bob Vetere, Chief Operating Office and Managing Director of the American Pet Products Manufacturers Association (APPMA) highlighted that "The industry must be smart enough to have standards of performance that are voluntarily adhered to. Self regulation within the industry is critical and never more so than right now." In the same article, Marshall Meyers, Executive Vice President, Pet Industry Joint Advisory Council (PIJAC) also noted that: "With continued growth, increased regulation is likely with respect to the live animal sector."

MAC Presentation at Meerwasser Symposium, Germany

Christiane Schmidt delivered a presentation on MAC Certification at the premier gathering of marine aquarists in Germany, the Meerwasser Symposium (Lunen, 11-13 March). Schmidt, formerly employed in the marine aquarium wholesale trade, is currently based in Germany and is working to increase MAC's efforts with importers and retailers in Europe.

MAC Information Presented in Russia

Aquarium fish expert Gerald Bassleer presented lectures at the International Aquarist Conference and the 5th Marine Aquaristic Professionals Seminar (5-6 February) that included information on MAC Certification, especially as it relates to acclimation and fish health. Bassleer has also included information on MAC in the latest edition of "Diseases in Marine Aquarium Fish: Causes, symptoms, treatment".

Other News

World Aquaculture Society (WAS) and MAC

MAC and the World Aquaculture Society (WAS) are increasingly interacting on a number of levels. Many WAS members are reviewing and commenting on the draft MAC Standard for Mariculture and Aquaculture (MAM) that are nearing completion. MAC will be presenting the MAM Standard at the World Aquaculture 2005 Conference (May 9-13, Bali, Indonesia), where MAC's Certification Systems Director, Peter Scott, will also be presenting the results of efforts undertaken from 2002-2004 to develop standards for the Live Reef Food Fish Trade. At the World Aquaculture 2004 Conference, which was held in conjunction with Marine Ornamentals 04 in Honolulu, Hawaii (March, 2004), the WAS generously donated the WAS '04 excess conference bags that remained after the event. We are very grateful for this donation to MAC who is distributing the bags to participants in the MAC "Training of Trainers" program (described in previous issues of the MAC News) and to the collector who are participating in training in the Philippines.

Remember to visit the MAC website at <http://www.aquariumcouncil.org/> for more information and to subscribe to the newsletter.



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Chips...er...Tips

Feeding Tip #1

By Stan & Debbie Hauter

Edited By Elizabeth M. Lukan, 7/27/05

Use some type of feeding or lettuce clip to secure leafy foods down so it is not free floating around the tank.

If you do not use a feeding or lettuce clip, secure leafy foods down by placing part of it under a rock, with the majority of the food sticking out waving in the current, to keep it on the bottom.

Editor's Comments:

Editing was limited to spelling and grammar corrections and putting into the Fish 'N' Chips format. The above is part of a larger article, How To Tips For Feeding Saltwater Livestock, which can be found at http://saltaquarium.about.com/cs/fishphotosa_b/ht/feedswfish.htm.

About®
Saltwater Aquariums

To Submit Your Tip: Visit <http://www.marinefiends.com/submit.html>.

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Upcoming Events

By Elizabeth M. Lukan 7/27/05

Event	Start Date / Time	End Date / Time	Location	Event Details, Notes, and For More Info
August 2005				
MASNA 2005 Photo Contest	Aug. 6, 2005			http://www.macnaxvii.com/pages/photocontest.htm
1st Annual Coral Conference and Frag Swap	Aug. 6, 2005	Aug. 7, 2005	Drs. Foster & Smith's Aquacultured Coral Facility, Rhineland, WI, USA	http://www.liveaquaria.com/general/general.cfm?general_pagesid=366&ref=3175&subref=BF
MASLAC Meeting: Speaker: Steve Pro	Aug. 13, 2005 6:30pm		Denny's, 5751 Sunset Blvd., Hollywood, California, USA, (323)464-8435	Marine Aquarium Society of Los Angeles County: http://www.maslac.org/
PMASI: A Day with the www. ReefCentral.com Experts	Aug. 27, 2005 9:30am	Aug. 27, 2005 5pm	Pittsburgh Zoo & Aquarium, Pittsburgh, PA, USA	http://www.pmas.org/conference.htm
September 2005				

Aquaculture for Africa - Unlocking the Potential! 7th Conference of the Aquaculture Association of Southern Africa	Sept. 12, 2005	Sept. 16, 2005	Grahamstown, South Africa	http://www.aasa-aqua.co.za/LatestNews/ReadNews.asp?NewsID=51
The American Zoo and Aquarium Association: 2005 Communiqué Photo Contest		Sept. 16, 2005	Grahamstown, South Africa	http://www.aza.org/AZAPublications/photocontest/ (<i>url dead 10/07/05</i>)
MACNA XVII	Sept. 16, 2005	Sept. 18, 2005	Washington DC, USA	http://www.macnaxvii.com/
Beachwatch 2005: The UK's biggest beach clean and survey, organized by the Marine Conservation Society.	Sept. 17, 2005	Sept. 18, 2005	All around the UK	http://www.adoptabeach.org.uk/
The American Zoo and Aquarium Association: 2005 AZA Annual Conference	Sept. 13, 2005	Sept. 18, 2005	John G. Shedd Aquarium, Chicago, IL, USA	http://www.aza.org/ConfWork/AC_Intro/
SuperZoo 2005	Sept. 21, 2005	Sept. 22, 2005	Mandalay Bay Convention Center, Las Vegas, NV, USA	http://www.wwpia.org/i4a/pages/index.cfm?pageid=191
Aquarium & Zoo Facilities Association 12th Annual Conference	Sept. 25, 2005	Sept. 28, 2005	Tennessee Aquarium, Chattanooga, TN, USA	http://www.tnaqua.org/2005azfa.asp

October 2005				
MASLAC Meeting: Speaker: Anthony Calfo	Oct. 8, 2005 6:30pm		Denny's, 5751 Sunset Blvd., Hollywood, California, USA, (323)464- 8435	Marine Aquarium Society of Los Angeles County: http://www.maslac.org/
Backer's 39th Annual Pet Industry Trade Show and Educational Conference	Oct. 7, 2005	Oct. 9, 2005	Donald E. Stephens Convention Center, Rosemont (Chicago), Illinois, USA	http://www.hhbacker.com/hhbacker/x05tradeshow.asp
November 2005				
MCS Annual Conference 2005	Nov. 5, 2005		Exeter, UK	http://www.mcsuk.org/events/events.php
CIPS 2005 - The 9th China International Pet Show	Nov. 7, 2005	Nov. 10, 2005	China Export Commodities Fairground, Guangzhou, China	http://www.nuernbergglobalfairs.de/main/dnixekt5/e6zhezaa/page.html?referent=CIPS&snid=e6zhezaa
America's Family Pet Expo	Nov. 18, 2005	Nov. 20, 2005	Novi Expo Center, Novi, MI, USA	http://www.wwpia.org/afpe.cfm?gotopage=pe-novi.html
2006				
Marine Ornamentals '06	Feb. 13, 2006	Feb. 16, 2006	Riviera Hotel & Casino, Las Vegas, Nevada, USA	http://www.hawaiiacquaculture.org/marineornamentals06.html
Aquaculture America 2006	Feb. 13, 2006	Feb. 16, 2006	Riviera Hotel & Casino, Las Vegas, Nevada, USA	http://www.was.org/Meetings/ConferenceInfo.asp?MeetingCode=AA2006
Backer's 18th Annual Pet Industry Spring Trade Show & Educational Conference	Apr. 7, 2006	Apr. 9, 2006	The New Atlantic City Convention Center, Atlantic City, New Jersey, USA	http://www.hhbacker.com/hhbacker/s06tradeshow.asp

Undated Events				
Jellyfish Survey	now	unknown		MCS: http://www.mcsuk.org/turtles/turtles.php?title=jellyfish%20survey
Lighting Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=10
Marine Aquarist Profile Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=8
Overflows Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=13
RIO Aquarium Pump Failures Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=12
Salinity Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=6
Salt Mix Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=7
Sandbed Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=11
Temperature Survey	now	unknown		Reefs.org: http://reefs.org/GBSurvey/surveyq.php?survey_id=9

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