



The Living Reef

July 2007

Wednesday 25th 7:30pm

Hi everyone,

The refugium concept has been around for some time now, and is gaining popularity rapidly. I find mine a fantastic addition to the reef tank, completely different as it is full of alga, but just as fascinating as the reef itself. It is amazing to discover new growths of micro and macro alga and wonder how they got there, as they seem to grow from nowhere, not being introduced to the aquarium on purpose. The refugium also serves as a great nutrient export mechanism. I regularly remove 4 odd litres of algal growth about every 3 weeks, and this goes straight onto the garden where it quickly degrades

into a potent fertiliser. Copepods and amphipods also abound in the refugium, a fresh and free food source for corals and fish. They also serve to break down detritus and other rotting organic materials. This has been my first tank with a refugium, and the differences compared to my previous tanks are astounding. I would highly recommend everyone to have a go at one and enjoy the advantages of added water volume too!

See you at the meeting!
Warren

[RTAW Reefpedia](#)

This [wiki](#) has been established as an encyclopaedia of reef keeping by the [Marine Aquarium Societies of Australia \(MASA\)](#).

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MASWA Meeting Calendar....

July 25th - Lee McIntyre
4 Florey Place, Huntingdale
Swap Meet!

August 29th
Warren Taylor – Wattle Grove
Frag Fest

September 26th
Chris Sutton – Special Raffle

October 31st
??? – Guest Speaker

November 28st
??? – Frag Fest

MASWA Contact Information....

COMMITTEE – 2007

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Treasurer – Treasury/Payment Enquiries
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Warren Taylor – 0414 486 999
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Web Editor – Web Page Enquiries
Shona Whaite - 0428 746 620
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Social Coordinator – Meeting Venues
Advertising Enquiries, raffle donations,
Even "just to be sociable"
Maria White – 0416 206 647
n1venus@bigpond.com.au

Frag Fest Coordinator –
Ronald Tan - 9304 7890
cyberon@westnet.com.au

WEB ADDRESS
<http://www.masa.asn.au/maswa.php>

MEMBERSHIP PAYMENTS

Cheque: Make all cheques payable to Paul M. Tayler.
EFT: MASWA Inc BSB 086-136 A/c 872473681 (please include your name on all EFT transfers!).
Cash: Make payment in person only.

Postal Address:
Paul Tayler (MASWA Treasurer)
PO Box 7185
Shenton Park WA 6008



MASWA Message Board....

MASWA Test Kits (Free Testing)

MASWA's members are able to bring along water samples to any meeting and test their water. This is handy to verify your own test kits, or to try a kit you don't have at home. The kits are mainly Salifert Tests and include PH, Calcium, Carbonate Hardness/ Alkalinity, Nitrate and Silicate. Chris will also be bringing along his Phosphate Light Meter and MASWA now has a Refractometer to test the salinity of your water. This is a great free resource so make sure to take advantage of it. If you are unsure of how to test your water, bring along about 100ml and ask for help, its free!

Membership Cards



MASWA will be introducing a Membership Card this month. The cards has been introduced so members can increase their social prestige, showing them off to your mates at the Sunday BBQ's and also to show your partners and families there's a reason why you keep disappearing the last Wednesday of each month.

But more importantly, the card has been introduced to help raise awareness that MASWA is a society of Marine Aquarist's in WA and it will help members to be easily identified to our Sponsors and other marine stores that you may shop at.

So don't be afraid to flash them around and

who knows you may even get a discount from your local fish shop.

Yearly Photo Competition!

We will be running a yearly photo competition. Photo's can be submitted at the meeting or via email. The topic is obviously your aquarium, but it can be a single fish, a prized coral, or a full tank shot.

Prizes will be as follows:

1st place: A reefing book.

2nd place: LFS voucher

3rd place: One years MASWA Membership

Photos have to be submitted by the November meeting, and the judge's decision will be announced at the Christmas Meeting.

Email your entries to a committee member!

New Members.

No new members this month!

MASWA now has its own bank account.

Please update your banking details for when you are making your membership payments.

The new account details are listed on the second page of the newsletter, but just in case here they are again:

MASWA Inc
BSB 086-136
A/c 872473681

Last Months Meeting Rundown...

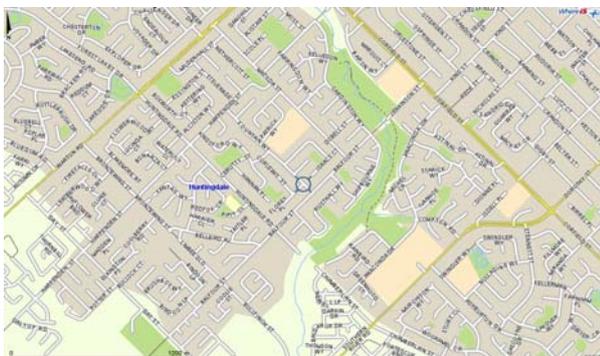
Last months meeting was at Halszka's in Willeton. It was a good turnout of members, about 25 came to reap the goodies on offer on the special raffle night. The total Prize Pool was about \$500!



Raffle winners:

Door Prize - Ross Coghill
PADC voucher - Jerome Chiew
F.O.Farm - Mihn
F.O.Farm - Ros Coghill
Rocky Reef Voucher - Neil McKenzie
Reef Aquariums(book)- Chris Sutton
Aquarium Corals(book) - Allan Whitehead
Corals(book) - Chris Wearn
Reef Inverts(book) - Ron
Amazing Facts About AU Marine(book) - Grant Roncevich
Salt Water Aquariums Make a Great Hobby(book) - Chris Cooper
Cataphillia(coral) - Stuart

Up & Coming Meet Information.....



This months meeting is at Lee McIntyre's (4 Florey Place, Huntingdale 6110). It is also a Swap Meet night so bring anything aquarium related to buy/swap/sell. Remember that you are selling to other MASWA members so please give them a

good deal! Last year we had a fantastic swap meet with second hand pumps, heaters, light units, metal halides all going out the door really cheap. That being said : MASWA Inc can not be held responsible for damaged / misleading / overpriced / faulty goods! It is solely inbetween the seller-purchaser.

If you are having difficulties with the map, Zoom in!

The Marine Aquarists Society of WA Inc is a name that we, as a group of friends with like interests have applied to ourselves for the purpose of information exchange. No one person, nor the group as a whole, can be held responsible for liabilities, injuries or other that may result either directly or indirectly as a result of our gatherings or the information exchange therein. The same applies to the information contained in this newsletter.

Feature Articles

We take a one month break from Ross's reefing guide, this month its:

Myth 13: The refugium concept. From: <http://www.reefkeeping.com/> Author Eric Bourneman (pictures removed to fit!)

The now-common practice of maintaining "refugia" is a welcome advance to the reef aquarium hobby. The concept, as far as I can recall, originated with the design of the Smithsonian Caribbean mesocosm in the 1980's. As an offshoot of the technology that was used in that display, algal turf scrubbers were licensed to Inland Aquatics, who soon offered drop-in refugia to retrofit existing tanks not utilizing turf scrubbers. In the 1986 book, *Dynamic Aquaria*, Adey and Loveland write, "Most of our refugia have been directed towards freeing attached fleshy algae, soft-bottom invertebrate populations, and plankton from severe predation by fish and larger invertebrates (particularly crabs and lobsters)...In general, the semi-stability that is achieved in community and population structure in the wild over large areas, and at time scales of centuries and millennia, is achieved in microcosms, mesocosms, and aquaria by the manipulation of space (refugia) and, when necessary, the populations themselves."

In any case, the rest is proverbial history. Now, do-it-yourself refugia and commercially available refugia exist at every turn and are very common in today's reef aquaria.

As mentioned, the idea behind refugia was to provide an area safe from constant predation for the many small organisms that were quickly eaten in displays housing large populations of fish and predatory invertebrates. Macroalgae were often incorporated into refugia as both food sources and habitat. Soon, the rich flora and fauna that tended to grow in refugia was exploited as a recovery area for sick fish, and could act as a nursery for breeding species in some cases. Of course, the size of the refugium might limit how many predators (as adults or juveniles) might be able to temporarily dwell there.

As more aquarists began to utilize these small, attached tanks, the ideas behind them were both improved upon and also bastardized. Soon, mud- and *Caulerpa*-filled sumps became commercially developed as a natural filtration method. Aquarists using these systems noted the luxuriant growth of the same populations mentioned above, and likely also noticed how they rather resembled things called refugia. Other aquarists took advantage of a new tank in the system utilizing the same water in which many of their corals were thriving, and the refugia began doubling as coral propagation tanks. Of course, the corals appreciated the extra available food, too. All too soon, photographs of refugia with one or two fish, or some shrimp, began appearing on websites. The refugium had become a low flow, specialized habitat reef tank with predators whose primary purpose was really denitrification through the use of sand beds and large quantities of the toxic algae, *Caulerpa* species.

The concept that macroalgae and sand beds could be used in refugia as nutrient uptake began in the 1980's. The widespread use of them as such seemed to be a novel concept to many, though it wasn't. However, it was a welcome use and a wise idea to incorporate them to many systems. Yet, refugia by themselves are generally quite small, and the largest fraction of nutrient processing of a tank is probably happening in the larger fraction of the system. In other words, small refugia with sand and macroalgae are supplemental to the processes and uptake happening in the bulk of the tank. Most aquarists keep one to many herbivorous fishes in their tanks, in addition to the many herbivorous invertebrates that are major grazers of algal biomass. Just as in the wild, with low nutrient levels in the tank, algal control is a top-down process where grazing limits algae within the main reef system. If anyone doubts this to be the case, remove all the

herbivores from a well-lit reef aquarium and watch what happens. Turf algae will begin growing rapidly. It is not the magical properties of *Caulerpa* in action, it is just ecology.

I am not in any way condemning the use of macroalgae in refugia. I am very fond of many of them, although many have quite numerous and toxic secondary metabolites, like soft corals and sponges. In particular, I am very unfond of *Caulerpa* (Figure 5). It is invasive and very difficult to eradicate. It is toxic to fish and has many metabolites - and releases them when the organism degenerates during spawning. Acidic rhizomes etch carbonate (Figure 6) and these algae can kill other more desirable species by overgrowth. I have had it grow right through the stalks of soft corals. Many aquarists say that it has not been a problem for them. My response? Just wait. It will. I guess my big question regarding *Caulerpa* is why use it at all when so many more desirable species of macroalgae exist, like *Chaetomorpha* species, or others (Figures 7 & 8).

To restate yet again, a refugium is a place provided to allow certain organisms to grow while freed of predation or herbivory. If one incorporates predators such as shrimp, fish, and corals into a refugium, the very reason for its existence is lost. Given the small size of most refugia, a handful of zoanths and a couple shrimp will likely decimate any populations of small organisms that were originally supposed to breed and feed the main display tank. If one desires to keep an area for breeding or propagating organisms, it might be a tank that replicates a habitat and that may look like a refugium - but it is not a refugium. If one desires to have a display tank filtered by natural processes, it should be ideally (significantly) larger in scale than the display to be effective. Otherwise, any natural filtration is probably largely supplemental to what is already occurring in average reef aquaria, although I imagine with careful consideration it might become quite significant. The natural filtration of the display was already initially addressed with live rock and sand beds (Berlin, ATS, and Jaubert methods). Protein skimmers provide more than enough additional filtration in most other systems (Berlin method). A refugium design should incorporate food sources and habitats that are conducive to the growth and reproduction of organisms that would otherwise become food for the mouths present in a reef aquarium display. In all likelihood, these same elements will also provide additional benefits such as nutrient uptake and regeneration.

As a final point, many aquarists comment on the amount of small crustacean life in refugia - and there often is. However, many of these same crustaceans are benthic or demersal zooplankton, and are often associated with reef structure and cavities. Providing a fair amount of rubble in refugia is a good idea. In fact, I would suggest (and know personally for a fact) that most people would see far more crustaceans in a refugium filled with live rock rubble that is allowed to have turf algae grow on it than in the macroalgae and sand dominated refugia that are common today. The difficulty will be keeping enough turf algae growing as fast as the amphipods consume it.

Potential: slight to moderate. In most cases, a refugium of any sort provides some benefit, although it may be largely functionless for the desired purpose, depending on the species it contains. The only real risk may be with the inadvertent mass release and death of some macroalgae species during spawning events.

Distribution: moderate. The use of refugia is widespread but may be most common in the United States. Refugia, while common, are certainly not standard incorporations into most reef tanks yet.

Fishy Links And News

Green reef tank! what's going on?

I have finally upgraded to a 30G reef tank but unfortunately it has all of a sudden turned green!

I had a 150W Mh on it but as it turned green i decided to move back to fluorescents. It's decreased but not gone yet.

How do I get rid of it?

Kh 10

Nitrate 10ppm (5ppm drop)

Ph ~8.3...

Seaweed growing HELP !

I have had my marine tank setup for about 2 years now with no problems at all, however over the past month i have had seaweed growing on the live rocks, i have been pulling it out as i dont want it but now it is getting out of hand, just about taken over the tank. any ideas ? any at all. Thanks in advance...

Nitrate reduction Ok decided to post this in the advanced forums because I have tried all the simple solutions and nothing seems to help me.

My tank is going on 2 years now and I still cannot get the nitrates under 10ppm. With a large water change they will drop to 5 but they increase quickly from there.

I dont know if it is related, but I also can't keep acropora at all. So far I have had about 8 attempt at keeping acropora. The first one actually lasted a month or so - the rest suffer from RTN within threee or four days.

Other than the acropora, all other corals are doign well with the exception of a gorgonian which is in a slow demise...

Classifieds

Your stuff for sale here!
Please try to keep it
aquarium related.
It can be equipment, fish,
corals etc!
Email a committee member
to get your ad shown!

MASWA Sponsors....

It's official; MASWA now has Seven commercial sponsors! MASWA sponsors get an advertisement and a banner in the newsletter each month. The advertisement can be used to advertise monthly specials etc. Depending upon what has been agreed with the sponsor they may offer MASWA such things as member discounts, donations of goods, gift vouchers or special offers.

Advertisements in The Living Reef do not necessarily reflect MASWA endorsement of any product, service or advice offered by the advertised business. If you would like to advertise in The Living Reef, please contact Maria White (Social Coordinator) on 0416 206 647 or email: n1venus@bigpond.com.au.



Fremantle Ocean Farm will generously donated the next water change to all new members who join MASWA and 2 free water changes vouchers for the raffles



has kindly donated a door prize for the MASWA Meetings

Available from:
Midland Pet Aquarium Center
205 Great Eastern Highway Midland
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Perth Aquarium & Display Centre
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<http://www.perthaquarium.com.au/>
Pisces
Unit 3/11 Augusta st., Willetton



P.O. Box 283, Quinn's Rocks, Western Australia, 6030.

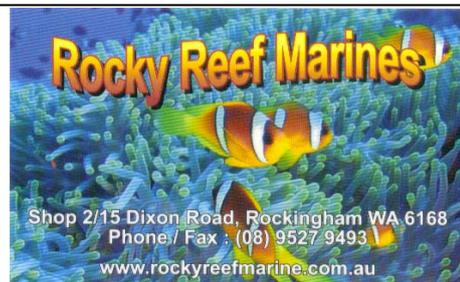
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Oceanarium has generously donated corals for Frag Feasts, Demonstrations and Raffles



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Suppliers of quality net caught fish from Vanuatu and the Fiji Islands. Also a Large selection of corals and Inverts Come and see Martin and Marc and mention you are a MASWA Member and they will give you 10% discount on your purchase.

Rocky Reef Marine has generously donated gift vouchers and products for the MASWA raffles

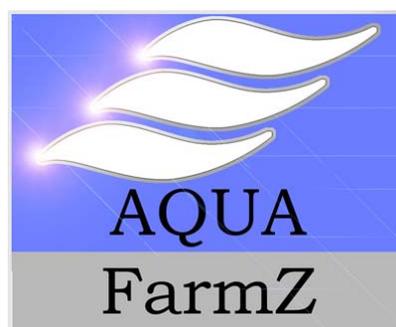


Cnr Carrington & Forsyth St O'Connor WA 6163

ph: (08) 9314 7630 email: vebas@vebas.com.au

Open 7 Days 8:00 AM - 5:30 PM (Thursdays 8:00 AM - 8:30 PM)

Veba's generously donates prizes for the MASWA raffles



Aqua FarmZ Supplies High End Quality Equipment such as BubbleKing and ZeoVit. Aqua FarmZ has generously donated raffle prizes



<http://www.perthaquarium.com.au/>

Perth Aquarium and Display Centre has generously donated gift vouchers for the MASWA raffles

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