

## IN THIS MONTH'S MASWA NEWS

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is a relatively expensive feed additive, and they suspected that commercially produced feeder guppies are likely to be biotin-deficient). However, freshwater fishes may contain slightly higher amounts of the B vitamins in general, and it is also possible that feeding marine predators entirely on feeder guppies could O.D. them on biotin as well -- it depends on the biotin composition of feeder guppies and goldfish (which they didn't know)."

"Because there is no real data for the nutritional profiles of aquarium fishes, I did a survey of the aquaculture literature to find the nutritional composition of feeder fishes to compare. Of course, I couldn't find the composition of guppies and goldfish, so I did the best I could. A quick comparison of farmed catfish & carp to cod & snapper (the most reasonable proxies for which I could find the exact nutritional composition in my search) and the values I could locate are included below. I doubt that the biotin issue is likely as important as some of the other nutritional differences between the freshwater and marine fishes (at least the total B complex values are not really different, but the saturated and short-chain fat values are very different between the two groups):

	Sat. Fat	18:2	18:3	20:5	22:6	B Complex
<b>Catfish</b>	1.77%	.88%	.09%	.07%	.21%	~3.5mg/100g
<b>Carp</b>	1.08%	.52%	.27%	.24%	.11%	~2.8mg/100g
<b>Cod</b>	.08%	.005%	.001%	.08%	.13%	~2.5mg/100g
<b>Snapper</b>	.28%	.02%	.004%	.05%	.26%	~1.5mg/100g

"My friends generally felt that it was best to avoid feeding freshwater feeders to marine fish and vice versa because of the different fatty acids profiles of the prey items, and both thought that the primary secret to maintaining healthy fish/inverts long-term in aquaria had more to do with a varied diet than any specific nutritional component or additive. Given the limited data I could find, it looks like the nutritional profiles of freshwater fishes differs significantly (at least in terms of the saturated and short-chain fats) than that of marine fishes. Together with their experience from public aquarium fish autopsies, it would appear prudent to avoid feeding primarily freshwater fishes to marine predators in general. The primary recommendation from these sort of discussions (again and again) seems to be that aquarists need to simulate the natural diet and vary it as much as possible."

## Freshwater Feeder Fish for Marine or Not?

by Rob Toonen

Rob Toonen is a regular contributor to the Reefkeepers Mailing List and is currently doing his Marine Science PhD in California. Recently he was raising a clutch of juvenile octopus that were spawned last Autumn (our Spring). In his search for information regarding the nutritional requirements of the young, he entered into a debate about whether or not guppies were a suitable food item for the juvenile octopus.

A friend of Robs is a fish parasitologist at the University of British Columbia and he volunteers with a veterinarian (DVM, PhD in fish disease at Guelph) at a couple of public aquaria to do autopsies on dead fish. He told Rob that the single most common cause of death he's seen since he started to do the autopsies at public aquaria is "fatty liver disease."

Below, Rob summarises what he discovered in his research and discussions with his veterinarian friend on the issue of feeding freshwater fishes to marine predators:

"Although not really a disease, fatty liver is a serious condition in which the liver becomes enlarged, often to the point that it interferes with the other internal organs and is apparently the cause of death. The bottom line from a number of exchanges I have recently had is that the most common cause of fatty liver disease is a diet high in saturated fats, although biotin and/or choline deficiencies, toxemia and 'unknown nonspecific causes' are also possibilities (FISH MEDICINE, by Michael K. Stoskopf, DVM, Ph.D, 1993, Saunders). My buddy said that he also sees the same 'fatty liver' disorder in a variety of marine fishes (such as groupers and lionfishes) from pet shops where they were maintained on a diet of goldfish, and he felt the disorder was caused by the inability of marine animals to deal well with saturated fats common in freshwater fishes."

Rob went on to say, "Aside from the fatty liver 'disease', fatty acid deficiencies in fishes have been shown to result in reduced growth, higher percentages of muscle tissue water, liver degeneration, higher susceptibility to bacterial infection, and a decrease of hemoglobin in the blood cells among other nutritional problems (such as hair loss in mammals). Neither of my friends were sure of the exact fat profile of guppies or goldfishes, but both felt confident that freshwater fish in general (and feeder fishes in particular) were very different in fatty acid composition than are marine fishes. For fatty acids in which marine fishes are generally high, freshwater fishes are typically the converse. They also thought that biotin was a possible concern for feeding any marine predator a diet entirely composed of feeder guppies or goldfish (biotin

## Next Meetings

**May's** MASWA meeting will be held at 7:30 pm on WEDNESDAY, May 26<sup>th</sup> at Mike Hudson's house. The address is 115 Stanhope Road, Kalamunda. Mike has a 6'x2'x2' system with a trickle system and denitrator. Mike's tank will be a bit of a surprise to us all though as he has never hosted a MASWA meeting before.

**June's** meeting will be held at Rick White's house. The meeting will be at 7:30 pm on WEDNESDAY, 30<sup>th</sup> June. The address is 19A Clendon Way, Morley. Rick's tank will also be a surprise to us all as he also has never hosted a MASWA meeting before.

## Previous Meetings by Andy Dolphin

**March's** meeting was at Tony "DIY King" Fiorentino's place. Tony has probably held more meetings at his house than anyone else in the club, but everyone is always fascinated by the purpose-built equipment room behind his aquarium. Of course, much of the equipment there is made by Tony his his alias. Tony's 5'x2'x2' tank was looking pretty healthy on the night and was a real treat to see. A few members debated with Tony about the merits of finishing the light hood over his tank.

A raffle was held with the two prizes being a \$50 voucher donated by **Marine West** (won by Rick White) and a Mantis Shrimp Trap (supplied by **Aqua Direct Australia**).

**April's** meeting was held at Nathan's place in South Perth. It was good to see plenty of new members at the meeting. Nathan had just set up his new tank which was custom built in-situ...and he had all the photos to prove it! After a couple of months of planning and construction of the metal frame base, the tank construction was completed mid-April. It was filled on the 17th of April by Denis from Fremantle Ocean Farm. Around 200 kg of Quobba Rock was added the next day. The following day, 10kg of Quobba sand were added with 20kg of ADA Aragonite Sand poured over the top. Fish including a spectacular Yellow Tang and Blue Tang, and corals were added over the following week. The tank is 76cm high, 91cm wide for the main section and tapers at one

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end to 10cm wide. The overall length is 230cm (almost 8 feet!). With the twin sumps, the system holds between 1200 and 1500 litres of water. Circulation is delivered by two Laguna 7000 submersibles for a total of 12000 L/h through 3 return pipes - and they are QUIET! The pump setup is to be modified so that the two pumps alternate and the subsequent flow rate reduced to 6000 L/h. After much prompting, Nathan turned the pumps off so members could rest assured the backflow through the return pipes wouldn't cause flooding in a power outage. I think we were all pleased that no flooding occurred?

The aquarium currently has just one 400W, 6500K GE bulb running over it. This seems to be working very well with the corals so far, but Nathan is planning on putting on another 400W 6500K and some actinic fluorescents once the hood is built. This bulb is currently on for 8 hours per day.

Paul suggested moving some of the central rock wall to create a diagonal channel from front to back (although I'm not entirely sure which was the front or the back) and Nathan seemed keen on the idea. David brought along some coral cuttings and a bunch of scavenging Nassarius snails which are the latest trend in tank management. These snails normally feed on dead matter and bury themselves until they get a whiff of food at which point they emerge and race around the tank. Nathan already had some local Nassarius which are smaller, slower and less colourful - but much easier to get hold of.

All in all it is an impressive display with the feature-brick lighting supports being a unique addition. Those who were at the meeting would surely agree.

## Clownfish-Hosting Anemones in the Aquarium Part 2 – Description of Host Anemones *By David Bloch*

### Anemone Anatomy

Anemones are in effect like a large hard coral polyp without a calcium skeleton! Instead of being fixed in place and living on and in a calcium cup, they are able to move freely around the reef.

To understand how to distinguish between different species of anemones you need to know some of the anatomical names for the different parts of the anemone. Below is a brief anatomy lesson:

rapidly responding to the environment. Animals have muscles and most are capable of locomotion. Structural materials in animals consist of minerals, proteins, and polysaccharides such as chitin, but almost never cellulose.

Corals are animals with a mouth and means of collecting food. In fact, of all predators, corals have the largest percentage of their bodies devoted to prey capture. Corals have an external skeleton of calcium carbonate and protein. Reef-building corals contain algal cells that photosynthesize and produce some sugars and other chemicals, but ALL reef building corals need additional sources of nutrition, and most are actively predatory and MUST be fed. Most corals are NOT reef forming corals, and most species are found as solitary polyps in deep water or in temperate or cold seas. These corals lack the symbiotic algae and are incapable of photosynthesis. Corals typically have a reproductive cycle with a sexual and asexual phase, but these are not comparable to the gametophyte and sporophyte generations of plants. All corals are capable of locomotion at some stage in their life cycle, typically as a swimming dispersal stage called a planula larvae.

Corals contain muscles, nerves, digestive and reproductive tissues, and are capable of sensing and rapidly responding to their environment. They lack cellulose as a structural material, and they lack chloroplasts of their own.

## Annual Donations Overdue!!!

Please be aware that the annual donation for membership is due and has been since January! The suggested donation is \$10 for Juniors (under 18), \$20 for Singles, \$25 for Couples and \$30 for Families. If you have not yet paid, could you pass donations on to Andy Dolphin as soon as possible. The continued funding of the society is much appreciated by your society's members and newsletter organiser.

The people I currently have listed as paid-up members are M.Hudson, P.Harris, N.Cope, A.Dolphin, P.Groves, D.Bloch, J.Anderson, S.Tofts, G.Magill, C.Lawrence, F.&B.Krause, P.Harris, P.&M.Olive, T.Fiorentino and P.&C.Melvin. Unfortunately, we have had to carry non-financial members for 5 months now and can no longer afford to do so. Consequently, this will be the **last** newsletter sent to unfinancial members. If your name is not on the list of paid members and you think it should be, contact Andy on 9377 7362 (a/h).

**Aquarium Care:** This is an anemone that should not be purchased unless very strong illumination, good water movement and excellent water quality can be provided. It requires placement on a tall pedestal in the reef where it will receive strong Metal halide illumination. The presence of a pair of clownfish is believed to increase the success with this anemone species. If this anemone wanders around the aquarium it is an indication that its requirements have not been fully met. Once settled in this anemone can attain a large size. Like the carpet anemone this species also has strong stinging cells that can cause the tentacles to adhere to human skin. When purchasing this anemone it is wise to insist on a freshly imported specimen as they tend to deteriorate rather rapidly in captivity if not provided with good water quality and sufficient lighting.

## Corals are Animals?!

by Dr Ronald Shimek

Most people who come to my house and that haven't seen a reef aquarium before look at it and point out a coral. Typically they say something like, "What an unusual plant!" or "What kind of plant is that?" When I explain to them that corals are animals and not plants, they have a look of disbelief on their face and just smile and nod. I may as well have told them that I've recently been practicing witchcraft. Anyway, the question "Why aren't corals plants?" was recently asked on the Reefkeepers Mailing List on the Internet and Dr Ronald Shimek (a regular contributor to several aquarium magazines) gave this response:

Try to realize the difference between a plant and an animal. Plants are fully photosynthetic organisms capable of making their own food. At least some of their cells contain photosynthetic structures called chloroplasts which contain a chemical called chlorophyll and the biochemical pathway to convert light energy into chemical energy (sugars). Most plants are immobile except as seeds or spores. Plants lack muscles, nerves, and digestive tissues. The basic structural materials used in plants are polysaccharides such as cellulose. Plants lack larvae. Plants typically go through an alternation of spore producing and gamete producing generations.

Animals are incapable of photosynthesis. They have a mouth, and digestive tissues. They have nerves and are capable of sensing and

- The base of the anemone is known as the pedal disk. This part of the anemone is used to attach to rocks either on the reef or below the sand. Some species of anemone have a pedal disk that is a different colour to the column.
- The trunk of the anemone is known as the column. Different species of anemone often have different coloured columns.
- On the column of the anemone there may or may not be little raised bump or spots known as verrucae. These structures are adhesive in nature and serve to hold the oral disk of the anemone open against the substrate.
- The top surface of the anemone is known as the oral disk. The oral disk is the flattened area supporting the rows of tentacles. The colour of the oral disk can be a different colour to the column and or pedal disk in different species of anemone.
- Emanating from the oral disk of the anemone is the finger like projections known as tentacles. The size, shape and numbers of tentacles of different anemone species often differ immensely.

## Species of Anemones

There are at least 10 species of photosynthetic clownfish hosting anemones found in coral reef areas. Of these 10 species, 4 species can be commonly encountered in the local aquarium shops. Of the remaining species, 3 are occasionally seen from time to time. Below is a description of the four most commonly seen anemones.

The four most commonly seen anemones in local aquarium shops are *Entacmaea quadricolor* (Bubble tipped Anemone), *Heteractis malu* (Sand Anemone), *Stichodactyla haddoni* (carpet anemone) and the Magnificent Anemone (*Heteractis magnifica*).

### Bubble-Tipped Anemone (*Entacmaea quadricolor*)

**Description:** The bubble tipped anemone is the most commonly seen anemone in the aquarium shops. As its name implies it has bubble tipped tentacles however this name is misleading, as the bubbles are found halfway along the tentacle if at all! Bubble-tips are commonly brown in colour and sometimes have a column that is red or pink. Often the oral disk is lighter in colour than the column. The pedal disk is nearly always the same colour as the column. There are no verrucae found on the column wall. Bubble-tips usually attain a maximum size of about 40cm in the wild. These anemones are a common sight on the reef and are often found in large aggregations – usually all clones. In the wild, bubble-tips

## Meetings – Social Calendar

May 26<sup>th</sup> Mike Hudson's house: **115 Stanhope Rd, Kalamunda**

June 30<sup>th</sup> Rick White's house, **19A Clandon Wy, Morley**

July 28<sup>th</sup> ???

August 25<sup>th</sup> ???

*If there is anything you would like to know more about or anything you would like to add to the newsletter, perhaps you have a different view to those hearin, call or send comments to the editors, David Bloch or Nathan Cope. Remember, this is your newsletter.*

**Attention:** *If you are able to hold a meeting at your place, please let us know.*

### **MASWA Membership**

Currently MASWA requests an annual \$20 donation from members. This covers the cost of newsletters, drinks, nibbles and other costs associated with the society. Members will receive information sheets and discounts on some products. We request a \$2 donation from visitors at meetings, and this entitles them to the next two newsletters after that meeting.

### **Friends in Common**

Jan Anderson, David Bloch, Gary Bowman, Dennis Bozil, Alvin Chua, Darren Collins, Nathan Cope, Anthony Desmond, Noel DeSouza, Andy Dolphin, Tony Fiorentino, Jim & Gloria Fletcher, Shaw Goh, Paul Groves, Peter Harris, Sid Harrison, Nick Holt, Kevin Horner, Mike Hudson, Frank & Ben Krause, Craig Lawrence, David Lee, Grant Magill, Mark O'Malley, Philip & Caron Melvin, Peter & Marine Olive, Michael Payne, Martin Pichler, Pam & Ken Pratley, John Rogerson, Phil Searle, Renae Srdarev, Ronald Tan, Steve Tofts, Greg Weryk, Rick White, Chris Williams, Paul & Danuta Williams.

If you've paid your money and your name is not on this list, tell Andy! Members on the web should check they are on the web site members list. Thanks to all of you for your encouragement and support, we look forward to seeing you at the next meeting!

### **DISCLAIMER**

The Marine Aquarists Society of WA 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.

