



# The Raleigh Aquarium Society

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## March 6, 2008

*Next Meeting: Thursday @7:30pm April 3, 2008.*

Meetings are held on the first Thursday of each month at the [North Carolina State University College of Veterinary Medicine](#) located at [4700 Hillsborough Street in Raleigh](#). Visitors are welcome! Snacks and light refreshments are provided. A raffle of fish and fish related items follow the meeting. Due to Security Issues, NCSU has required that the doors going into the downstairs lobby remain locked. Please be on time, as we will have a designated person standing by the door to let you in. If you are late, you may try knocking or call Linda Twaddle at 919-880-3782 or John Patterson at 919-264-4011.

## Meeting Agenda

### The Discus Breeders of Singapore

Our webmaster, Walter Wu will bring us this month's program. Just where is Singapore? Is it in China? Thailand? We'll find out. Then Walter will bring us the breeders, their specialty strains, their store or hatchery, and of course their fabulous fish. We also hope to welcome many new members from the 24th Carolina Aquarium Workshop. Hopefully you were all there and enjoyed yourselves and bought lots of stuff at the auction on Sunday. Frank Montillo our Treasurer would like all those who sold items at the auction to be at this meeting so that he can distribute the checks. We'll be treated to more of Jeff's great refreshments and a whole new Super raffle. What more do you want? Y'all come!

# Monthly Feature

## ARTICLE INFORMATION:

**Author:** Les Pearce

**Title:** The Brackish Water Aquarium

**Summary:** Setting up a brackish water aquarium. Salt. Osmosis. Water. Suitable plants and fish.

**Contact for editing purposes:**

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February 2003: *Fish Finatic*, Willowdale Aquarium Society (Canada)

July 2003: Translated into Italian, on *Aquarionline* at: <http://acquarionline.it/articolimondo.asp?id=3>

October 2003: *Water Changes*, Capitol Aquarium Society of Austin, Texas

March 2005: Translated into Italian (again!) on Anita Maccio's website in Italy, at:

<http://www.vergari.com/Acquariofilia/Salmastro09.asp>

## ARTICLE USE:

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## THE BRACKISH WATER AQUARIUM

by Les Pearce

from "*Fishworld*," FBAS, England  
Aquarticles

What is brackish water?

It is surprising how many people believe that the term brackish means dirty. If you look it up in the dictionary, you will find that in truth, it means 'saltish' or 'rather salt'. This is a fair description of what we know as brackish although, if you want to be pedantic about it, even fresh water contains salts.

We are mainly concerned with salts contained in sea water, primarily sodium chloride. As for the aquarium, we can take brackish water to mean that which is part way between fresh water and marine or sea water. To put a value on it, a specific gravity of around 1.005 is suitable with anything between 1.002 and 1.008 being quite acceptable.

The specific gravity is simply a measure of the density of water; the more salt added, the greater the density of the water. Pure distilled fresh water has a specific gravity of 1.000; sea water has a specific gravity of around 1.020 to 1.024 although this can vary around the world, with temperature and with the depth of water. To measure this value for your aquarium water you require an instrument called a hydrometer. These are readily available in most good aquatic

retailers but one major problem exists; namely that manufacturers seem to produce them almost exclusively for the marine fish keeper. Because of this, they are only calibrated for values much higher than those required for the average brackish water aquarium - usually around 1.018 to 1.030. A good alternative is a plastic hydrometer of the kind used by home brewers. These are quite cheap and you can easily obtain one from any shop that sells home-brewing equipment. They are ideal, being designed to measure in the required range.

Without doubt, the best type of salt to use in an aquarium is a good proprietary brand of synthetic sea salt, obtainable from most aquatic retailers. A cheaper but a far poorer substitute is ordinary cooking salt and, cheapest of all if you happen to live near the sea, is sea water diluted down with fresh water. You should be aware that this latter option carries certain risks and that you can easily transmit disease and pollution to your tank. This is not an option that I have ever employed, nor would I personally recommend it - and I live right by the sea! Under no circumstances should you use iodised table salt as this can be very detrimental to fish. The quantity of salt added is very much dependent upon personal preference - what works best for the individual aquarist and on the species of fish he or she intends to accommodate. I have known people who are adamant that one teaspoon of salt per gallon is quite adequate while others have successfully used up to three tablespoons per gallon. Generally, anything that produces a specific gravity within the previously defined parameters should produce favourable results. It has been suggested that when you carry out water changes, it could be beneficial to the fish to vary the salt content slightly with each change. In nature, this fluctuation will occur with the seasons. At times of heavy rainfall increased quantities of fresh water flowing into estuaries from swollen rivers will dilute the salt content of the water; conversely, hot weather and drought will cause the salt levels to become more concentrated due both to a decrease in fresh water in the rivers and from evaporation.

By far the most common occurrences of brackish water in nature are the estuarine areas where fresh water rivers meet the sea. Most of the fish that we frequently keep in brackish aquaria are either from these areas or adapted to migrate from the sea into the rivers and vice versa. The most commonly known example of the latter is probably the salmon, although this fish is not usually kept in aquaria. This fish is born in the relative safety of a river where it spends the first part of its life. As it grows, it migrates downstream to the sea where it will live and grow to adulthood. It will then return to the river to spawn and the whole cycle starts again. Because of this life cycle the salmon, and other species of similar behaviour, can readily adapt to a wide range of water conditions, including brackish.

Fish and plants have a tendency to adjust their internal salt levels to those of the surrounding water. Water molecules are small enough to pass through the membrane of cell walls; larger salt molecules are not. This passing of molecules through a membrane is called osmosis. The only way, therefore, for a freshwater fish or plant to maintain body salt levels when placed in brackish or salt water is to expel water, it cannot take on salt. It may sound strange but by expelling body fluid in this way the fish, or plant, can become dehydrated and die.

Because they inhabit tidal or estuarine waters, most fishes commonly kept in brackish conditions prefer a certain degree of water movement. The high volume of water turned over using power filtration can, therefore, be most beneficial. In order to help maintain hard, alkaline water a substrate containing calcium such as coral sand or gravel, crushed cockle shell or Calcium Plus is advisable. If you wish, you can mix this with ordinary gravel or use it on its own as an alternative

to gravel. Because of the flow over the gravel, a sub-gravel filter will obviously improve the effect of this substrate on the water chemistry.

The problem of dehydration caused by osmosis means that the variety of plants that can adapt to brackish water conditions is somewhat limited. Generally, plants with tough, waxy leaves such as Java fern, vallis and Sagittaria do best. Other factors in some brackish water aquaria can also be detrimental to the cultivation of healthy plants. As mentioned earlier, most brackish water species prefer water movement ... typically, however, plants do not. Many brackish water fish species commonly kept in aquaria are, to a greater or lesser degree, herbivorous and can do untold damage to a well-planted tank. The spotted scat, *Scatophagus argus*, for example, is an avid eater of plants. This species can grow to ten inches or twenty-five centimetres long under the right conditions and is a very deep-bodied fish. Imagine what such a herbivore could do to your plants.

The range of fish available to the brackish water enthusiast is wide and varied. Probably the most commonly seen of these are the mollies, *Poecilia sphenops*, *Poecilia latipinna* and *Poecilia velifera*. Incidentally, they derive their common name from their old scientific genus name, *Mollienesia*. This has now been changed to *Poecilia* but its use for the common name has remained. These livebearers are usually cheap to buy and they are easy to keep, adaptable as they are to a wide range of conditions. They are fairly easy to breed ... the female gives birth to relatively large, well-formed live young. They are selectively bred in a wide range of colours and forms, making them a bright and attractive choice for your aquarium. Mollies make an ideal introduction to the keeping of brackish water species.

Many families of fish that we are familiar with in the freshwater aquarium have representatives who have adapted to brackish water conditions. The cichlid family, for instance, is represented by at least two species of the same genus, *Etroplus suratensis*, the green chromide, and the smaller and more commonly seen *Etroplus maculatus* or orange chromide. The main representatives of the catfishes are the *Arius* species or shark catfish. This is a family of relatively large species, some growing up to 500 millimetres or half a metre in length which, in 'old money', is getting on for twenty inches.

A myriad of different goby species is available for the brackish water tank. Most commonly seen of these are probably the knight goby, *Stigmatogobius sadanundio*, and the bumblebee gobies, *Brachygobius doriae*, *Brachygobius nanus* and *Brachygobius xanthozona*. All these gobies are very attractively coloured and are a delight to view, scurrying around the aquarium with their jerky movements. The bumblebee gobies, as their common name would suggest, are black and yellow striped, while the knight goby has a base colour of grey covered with very bright and attractive mid-blue spots.

Some species of puffer fish and some rainbow fish are well-suited to the brackish water aquarium. There is the scat, sometimes known as the argus fish, *Scatophagus argus*, the monos, *Monodactylus argentius* and the larger, deeper bodied and less commonly seen *Monodactylus sebae*. The movement of monos around the tank seems to indicate a constant struggle for supremacy between nervousness and grace. There are the archer fish, *Toxotes* species, so named for their ability to spit a powerful jet of water at insects paused in a false sense of security on plants overhanging the water surface. The startled insect is thus knocked into the water and becomes a meal for the hidden marksman. What a marvel it is that this fish is able to calculate and

allow for the refraction of the light through the water in a split second and almost unerringly find its target.

The number of different species that you can keep in brackish conditions is considerable; there are far too many to mention in detail here. Generally, the shopkeeper can probably advise you on which species are brackish which are not and, as with fresh water and marine fish, knowing the water conditions to which the fish are acclimatised in his or her tank is important. Another good source of information is, of course, reference books. These will tell you the preferred conditions of the particular species featured. One word of warning, I have seen mentioned in some publications the words 'will tolerate' salt or brackish conditions. I assume the term 'will tolerate' to mean that these are not necessarily the fish's favoured conditions but the fish can be forced to adapt to them. This can neither be right nor fair to the fish and is totally unnecessary since there are many true brackish water species readily available to choose from.

The keeping of various brackish water fishes is sometimes ignored or pushed to one side as 'something to have a go at one day'. Yet in reality, it can be a fascinating branch of our hobby and well worth consideration for the 'here and now'. The care and maintenance of brackish water fish are no more difficult or complicated than the tropical freshwater fishes that most aquarists keep, and the wide diversity of unusual and interesting species available makes it well worthwhile and rewarding.

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# Fishy Reading

## Brackish Fish

Starting this month I would like to introduce a new feature of our newsletter. Each month I will try to review some books or articles about some aspect of fish keeping.

This month's feature article is about brackish aquariums so I would like to explore some of the information available on the subject. Historically, good information about brackish aquaria had been quite sparse and usually relegated to small sections of general fish keeping books. A book published by TFH in 1979 by Michael Gos titled Brackish Aquariums was about the best information available on these fascinating fish available.

This brackish "drought" has recently lifted. Two books published by Aqualog and one by TFH have expanded the hobby into this part salt realm.

The first book I would like to mention is about one of my favorite fish – puffers. The Puffers of Fresh and Brackish Waters by Klaus Ebert published by Aqualog in 2001 is not your typical Aqualog picture book. There is a lot of good information on the husbandry and native waters along with species behavior. The best volume on puffers I have seen.

The next book is also an Aqualog volume. Brackish-Water Fishes: All About Species, Care and Breeding by Frank Schafer published in 2005. This volume is one of the "Special" books in the series and as such contains more text than pictures. The information contained in this book is quite extensive and is for beginners as well as for advanced aquarists who wants to keep and breed these fish.

The newest volume is published by TFH and is Brackish-Water Fishes: An Aquarist's Guide to Identification, Care & Husbandry edited by Neale Monks published in 2006. This is the best general volume on the subject. The hows and whys of setting up a brackish aquarium are included. Aquarium decoration, salt tolerant plants, as well as the largest breath of species of any of the books mentioned (many of which are not brackish but can be acclimated to a brackish environment) are all included. If you are interested in brackish aquariums and you are just starting out with these fish, this is the first volume to get.

Well that's it for this month. I hope you enjoyed this quick review and let me know what you would like me to explore in the coming months. Until next time, happy reading and happy fish keeping.

John Jankowski

# Trading Post

None

## Monthly Web Links

**Raleigh Aquarium Society Forum** on Yahoo Groups  
<http://groups.yahoo.com/group/raleighaquariumsociety/>

**Potomac Valley Aquarium Society** in the Washington D.C. area <http://www.pvas.com/>

**Atlanta Area Aquarium Association** in Atlanta, Georgia <http://www.atlantaaquarium.com/>

**Carolina Fish Talk** <http://www.carolinafishtalk.com/>

**Charlotte Area Aquarists Society** <http://pvelasco.net/CAASBBS/index.php>

**Marine Aquarium Society of the Carolinas** <http://masotc.net/>

**North Carolina Koi & Watergarden Society** <http://www.nckws.com/>

**Carolina Aquatic Plant Enthusiasts** <http://www.ncaquaticplants.org/>

**Aquatic Gardeners Association** <http://www.aquatic-gardeners.org/>

**KingFish Services** <http://www.kingfishservices.net/>

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**[Down Under, Salt Water Fish & Corals](#)** Highway 70 (in between Agri Supply and White Oak Shopping Center) in Garner. 20% on livestock, 15% on dry goods) **919.662.8820**

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Please contact John Jankowski at [raleighaquariumsociety@yahoo.com](mailto:raleighaquariumsociety@yahoo.com) if you are an active member of the Raleigh Aquarium Society and do not have an up to date membership card. Membership cards can be picked up at any meeting.



# Raleigh Aquarium Society

## Application for Membership

Membership privileges include:

- Ability to post items in trading post section of monthly newsletter
- A discount card good at participating local pet stores
- All club discounts on club functions
- Education from the most knowledgeable aquarium experts in NC
- Yearly Membership - \$15.00 (includes spouse and children)

(Membership dues run from March 1st each year. New members joining any other time will be pro-rated at \$3 + \$1 for each month remaining in the year.)

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