

The Cichlids of Lake Malawi

To understand cichlids, understand their lake.

By Mark Smith

The cichlids of Lake Malawi comprise a group of fishes among the most popular with hobbyists worldwide. This is due in large part to their typically brilliant colors and their fascinating behaviors. There seems to be an almost endless variety of species that are continually arriving in the hobby. And, best of all, they are easy to maintain in the aquarium.

Lake Malawi is an enormous body of water. It is approximately 360 miles long, varying from 20 to 45 miles wide, and has a maximum depth of about 2300 feet. Because oxygen is available in only the upper 800 feet of the water column, this is where the life of the lake exists.

Another small lake, Lake Malombe, which is connected to Lake Malawi by the Shire River (running southward for about 12 miles) at the extreme south end of Malawi's southeastern arm, is actually considered part of Lake Malawi because of the regular influx of cichlids from the small lake into the larger one. The pH of the water is alkaline (ranging from 7.8 to 8.5) and hard, with an overall carbonate hardness of about 200 to 250 parts per million.

The temperature of the lake varies according to the depth and the particular time of year. During the dry season, from June to August, a southeasterly wind called the "mwera" creates an upwelling of the deeper, colder layer of the lake. This causes the surface temperature in the southern portion of the lake to be lower, around 68 degrees Fahrenheit. During the wet season, from November to April, the average surface temperature ranges from 74 to 82 degrees Fahrenheit.

My trips to the lake have always taken place between August and November. The weather is calm and somewhat warm then, with very little rain. The water temperature in the first 10 feet of the water column was always a couple of degrees warmer than the waters below that depth.

The underwater landscape of the lake is not particularly memorable, at least in comparison with the marked beauty of the cichlids. It's certainly nothing like diving into a coral reef, with its many beautiful fishes and a habitat that is just as colorful as the fishes.

In Lake Malawi the cichlids are the only aspect of the underwater landscape that displays brilliant colors. The habitats, usually mud, sand, rocks and detritus, show little color except for hues of browns, grays, dull greens and beige. However chromatically unappealing the aquascape is, it is nonetheless important for the survival and well-being of the cichlids.

The shoreline of the lake alternates between zones of sandy beaches and rocky areas. At the few locations where rivers enter the lake the sandy and rocky zones are separated from another by the presence of shallow muddy reed beds. The cichlids of the lake, especially the mbunas, have adapted to the rocky portions of the lake, and seem bound to them. They rely upon the rocks for shelter, and the algae and microorganisms on the rocks provide much of their food. The rocks also play an important role in the establishment of territories and boundaries, particularly when it comes to breeding. Finally, the rocks also provide refuge for the juvenile mbuna and other cichlids, as well as non-cichlids in the lake.

The sandy coastal stretches of the lake appear to act as barriers, keeping the rock-bound cichlids isolated to their particular rocky areas and discouraging groups of mbuna from swimming over and genetically intermixing with other groups of mbuna scattered throughout the lake. Nonetheless, it is likely that some mbunas do, on occasion, attempt to cross these open, unprotected stretches. Many, if not most, are probably consumed by the numerous predatory cichlids that inhabit these open areas of the lake.

Because the mbuna have been separated into many isolated populations, they have developed a multitude of color varieties and shapes over time, to the point where today there are literally hundreds of species living in the lake. (None of which explains how the hundreds of sand-dwelling and open-water cichlids also developed in the lake.)

Keeping this information in mind, the question often arises — especially among those who are considering keeping Malawi cichlids for the first time — as to what is the proper way to maintain these cichlids, and even induce them to spawn? I believe that knowing how these fish live in the wild, and understanding all facets of the areas in which they live (biotopes), will provide guidance for maintaining Malawi cichlids in the aquarium.

For example, they require a decidedly alkaline pH and relatively hard water. This is not to say that Malawi cichlids have not been maintained in water that is less alkaline and somewhat soft in carbonate hardness than is ideal. However, I find that for overall long-term success, it's best to mimic the natural habitat of the fish to the degree possible in the confines of an aquarium. By doing so you will ensure that the cichlids live longer, healthier lives, and will display their true colors and their behaviors (including breeding) more consistently.

You should try to duplicate the ideal water chemistry values before the first Malawi cichlid is put into your aquarium. Most cities have water that roughly matches the pH and hardness values Malawi cichlids are accustomed to. However, for those hobbyists who live in areas where the water has a low pH and low hardness, commercial buffering agents can be purchased from the local tropical fish dealer. Test kits are also available to help monitor and maintain these values.

Temperature should also be maintained within the range that has been recorded from the lake (68 to 82 degrees Fahrenheit), with the ideal median temperature of 78. Avoid extremes at either end of the range. Remember, the cooler the water temperature, the higher the dissolved oxygen content. Warmer water holds less oxygen and often requires additional aeration. Also, the warmer the water, the more active the metabolism of the fish is, leading to the need for more frequent partial water changes to compensate for the increased metabolic activity.

Maintaining lower temperatures, however, will not alter the need for regular tank maintenance and water changes. As already noted, the temperatures in the lake fluctuate over the year between the highest and lowest values. The Malawi cichlids in captivity may benefit from gradual temperature changes that mimic those in nature.

Proper diet is also important. In the lake these cichlids have diets that are quite different from what is normally offered in the aquarium. Many species are zooplanktivores and phytoplanktivores (define), some practice fin, scale and skin eating, others are paedophores (define), and some are detritivores, herbivores, piscivores, insectivores or omnivores (define all).

It would be impossible to feed Malawi cichlids the exact foods they eat in the wild, but it is possible to offer them close substitutes from among the many commercial foods available. For example, live baby brine shrimp could be offered, at least occasionally, to the group of cichlids that are considered zooplanktivores. Unwanted dither fish may provide the scales and fins that the few Malawi fin- and scale-eating cichlids seem to thrive on. Flakes high in Spirulina for the herbivores, feeder fish for the piscivores...you get the idea.

Having said this, I must note that just about every species of Malawi cichlid in the hobby has adapted to some type of flake, freeze-dried and pelleted food regardless of their feeding specializations. Still, I believe the goal should be to attempt to offer additional foods that are similar to their natural ones.

At the same time, it is known that many Malawi cichlids in the wild will eat foods they have not specialized for. For example, some herbivorous species will, given the chance, consume baby cichlids, zooplankton and microcrustaceans. However, if we offer normally herbivorous cichlid a diet high in protein, problems will inevitably arise with the health of the fish. This is why I recommend that the primary diets reflect the food resources the cichlids have adapted to in the wild.

Avoid feeding beef heart, which is much too high in fat. Also, do not offer them Tubifex worms, which have been linked with the appearance of bacterial diseases in Malawi cichlids.

Attention should also be paid to compatibility. Not all Malawi cichlids live in peaceful, close proximity to one another for their entire lives. For example, it would be unwise to keep larger species of the genus *Tyrannochromis* or *Buccochromis* together with some of the smaller mbuna of the *Pseudotropheus*, *Labidochromis* or *Lodotropheus* genera. If, however, you have a very large aquarium — at least 300 gallons — with lots of rockwork, such a combination may work, even if some of the smaller species are occasionally picked off.

Another unwise combination would be trying to maintain some of the most aggressive *Pseudotropheus* and *Melanochromis* mbuna with the sand-dwelling species of the *Lethrinops*, *Taeniolethrinops* or *Tramitochromis* genera. In this instance, the sand-dwellers would quickly be bullied and severely injured because the mbunas, which are highly aggressive, territorial rock dwellers, would dominate the far less aggressive and less territorial sand-dwellers. But, again, this combination could succeed in an exceedingly large aquarium with rockwork at the one end of the aquarium, leaving the rest of the tank an open sandy plain. This way both groups would have adequate living space.

Because many hobbyists who would like to keep many of these types of cichlids are not able to accommodate such large aquariums, they are forced to maintain the fish in much smaller confines. For this reason, it's important to pay special attention to what kinds of Malawi cichlids are kept together.

The choice of non-cichlid tankmates will depend on the particular species of Malawi cichlid being kept. It would take up far too much space to discuss in detail all the different species of non-cichlids you can keep with Malawi cichlids.

However, a couple of choices are worth mentioning. Virtually all catfish of the genus *Synodontis* can be kept with Malawi cichlids, as long as the catfish are not big enough to swallow your prized mbuna. Some species of Australian and New Guinean rainbowfishes can also be kept with some of the smaller Malawi cichlids, provided there is ample swimming space in the upper water column for the rainbowfishes.

Effective filtration and regular partial water changes are essential if you intend to keep Malawi cichlids. Although there are a wide range of filters available, a couple of filters deserve special attention.

An old favorite is the undergravel filter. When equipped with powerheads instead of airstones, this type of filter will provide excellent biological filtration. At the same time, you must pay strict attention to filter maintenance to avoid reductions in water flow through the gravel bed.

Use gravel of medium to large size to prevent the gravel bed from clogging, and hydrovacuum the gravel when doing water changes. Fine sand will quickly clog and should not be used. Larger size gravel has the added benefit of reducing the digging tendencies of many Malawi cichlids.

If you don't care to use an undergravel filter, I also recommend using a trickle filter for Malawi cichlids. You will need to properly maintain it to ensure consistently effective filtration, which requires water trickles over the biological media evenly and at a constant rate. For aesthetic purposes you may want to have a thin layer of substrate in the tank when using this type of filter, but this isn't necessary. Unwanted foods and waste products may accumulate on the gravel, making tank maintenance more frequent, which is why some aquarists choose to maintain bare-bottom tanks.

There are, of course, other types of filters, and they will also work. All that really matters is that some kind of reliable biological filtration be in place.

Regardless of how much filtration is on the tank, regular partial water changes are a must. Set up a schedule and then stick to it faithfully. I recommend that water changes be performed frequently enough to prevent nitrates from rising much above about 20 parts per million. A nitrate test kit can provide precise monitoring. The temperature of the new water should be the same as the water in the tank.

For the most part, the cichlids in Lake Malawi do not seem to be susceptible to many of the diseases common in the hobby. They are, however, prone to parasites and, occasionally, fungal infections found naturally in the lake.

Wild-caught Malawi cichlids are carefully treated for such parasites and fungal infections before being shipped to wholesalers. Even so, a quarantine aquarium should be a standard piece of equipment for aquarists who don't want to risk losing all their fish. Any newly acquired fish should be kept in the quarantine tank for one month and carefully monitored to see if any signs of disease appear. If so, an appropriate medication at the correct dosage can be administered. And remember, prevention is always much more effective than a cure.

Two diseases that Malawi cichlids more commonly succumb to in captivity are ich and bloat. Ich appears as tiny, salt grain-size white spots over the body. Before it becomes visible on the body of the fish it may brush against the sand or rocks in the aquarium, attempting to scratch itself. This is an obvious sign that it probably has ich, which can be easily treated with any number of medications on the market.

Malawi bloat, on the other hand, seems to be an ailment whose chief cause is inattention to water quality on the part of the aquarist. It is caused primarily by poor water quality — usually high nitrates — over a long period of time, as well as improper diet. Feeding cichlids too much food and the wrong kinds of food will help to bring on this problem. Foods high in protein (including the previously mentioned beef heart and Tubifex worms), should never be fed. These foods will cause the digestive tract to become inflamed and give the fish its bloated appearance.

At this point, the cichlid has stopped eating, the scales raise up, and it's just a matter of days before the fish dies. The medication of choice, metronidazole, will give mixed results if the condition is caught early on. Once the cichlid is bloated, no treatment will work. The best "treatment" is, again, prevention.

Two commonly occurring parasites found on Malawi cichlids are argulus and anchor worms. Both can be easily pulled off the cichlid and an antibacterial agent applied to the area where the parasite had attached itself to the fish.

I will, in future articles, be covering the cichlids themselves, as well as their reproduction in captivity. I will also discuss husbandry requirements in more detail.