Year of the Rainbowfish

A monthly column about Rainbowfish by Derek Tustin

Red Balloon Rainbows

Mutants, Mutts and Genetics

One aspect of being involved in the Rainbowfish community that becomes evident over time is the realization that there are some very important genetic issues that surround the keeping of these colourful fish. Interest in Rainbowfish can grow steadily as a person discovers one species, then another, and then more. But it is this gradual progression into keeping a wider variety of Rainbowfish (especially the rarer strains) that can often lead to disappointment and regret down the road.

Many species of aquarium fish are valued when they show a divergence from the norm that exists in nature. Often seen and often encouraged is the breeding of specific mutations to create something "new", such as the case in of "Mickey Mouse" and "Batman" platies (both *Xiphophorus maculatus*). Also not only an accepted in many sectors of the hobby, but also one that is actively encouraged is the breeding of two closely related species to create a more colourful hybrid such as in flowerhorns and parrot cichlids. While the later two are usually not welcome nor encouraged in most aquarium societies, the hobby in general, especially the commercial producers encourage and promote them. After all, they are either more colourful or come with a certain cachet which in turn allows most commercial establishments to charge a premium and in turn realize an increased profit.

But in addition to the intentional hybrids produced by hobbyists comes the aspect of lack of care on behalf of many of the larger commercial breeders, usually referred to as "fish farms". In researching this article, I was surprised at the number of disdainful references to "evil fish farms", "greedy" or "unethical" corporations, but even more surprised with the absolute lack of any definitive studies surrounding the allegations. It is alleged (and supported in part by the presence of hybrids in the hobby) that these large commercial facilities take little to no care in ensuring that different species of closely related fish remain distinct and separate when being bred in large numbers. The result is the creation of hybrids that are widely disseminated in the hobby, promoted as "pure" or "true" species, and then become accepted as such by many.

"Mickey Mouse" platy

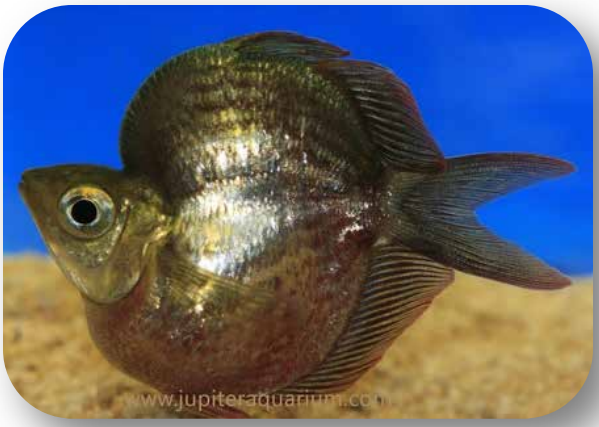
There is also the aspect of mutations. The aforementioned "Mickey Mouse" platy and the "Batman" platy were not designed from intentionally adding different components together to create something new, but rather the augmentation of a unique mutation through selective breeding. Almost everyone who intentionally breeds fish has done this, selecting the best looking fish possible when acquiring stock in order to ensure that any offspring are in turn attractive. (I recently received a unique strain of Rainbowfish from a hobbyist in Calgary. He told me that I would be getting the best of the offspring, not "the bottom of the barrel". I am incredibly appreciative of this, but even this, ensuring that the fish I get will display the best of the species characteristics in order to ensure the succeeding generation does as well, is an example of selective breeding.) But we also breed mutations to further emphasize a desired characteristic. A prime example in our own club is the proliferation of albino bushy-nose plecos

(*Ancistrus* sp.). We have all seen bags of normal bushy-nose plecos labelled with the notation "carries the albino gene". For some reason, especially in bushy-nose plecos, there is a desire to keep and propagate fish that carry the albino gene.

Now albinos are a benign example of a mutation. They occur in nature, but because their colouration makes them easier prey, often do not survive long enough to pass on the mutation. But there are also mutations that are eye-catching because they are different but are not benign. Since different means profit in the eyes of many fish retailers, they are often featured and promoted as something unique and therefore desirable. One such example that has been appearing more frequently in local pet stores is the "balloon" deformity.

I'm going to discuss several different aspects of genetics (in general – no specifics as I am neither a scientist nor a geneticist) and breeding that I've touched on above as they relate to Rainbowfish. Much of what I will mention is directly applicable to other species as well, and I hope that in presenting this information you will consider the implications not only to Rainbowfish, but to the hobby in general.

Balloon Rainbowfish



Balloon Incisus Rainbow

Disgusting. I try not to pass judgement on too many things, but in my opinion, the "balloon" mutation in any fish is an abhorrent thing. Some breeders and fish farms attach "cutesy" names to fish in an attempt to attract sales. Indeed, "painted" tetras, "hockey stick" tetras, "Mickey Mouse" platies (although I'm surprised Disney hasn't placed a cease and desist on those), "Batman" platies, "strawberry" tetras, "blueberry" tetras... the list goes on and on. What is descriptive about these names? The artificial colour of the fish? The markings of a fish that will last only one, maybe two generations? But of a "descriptive" name, what is more innocent sounding, invocative of the innocence of childhood, than the word "balloon"? Why not "golf ball" (although I have seen that one used), or "tennis ball", or "ping-pong ball"? No, to children (who are the ones most apt to notice something different) a balloon is innocence, freedom caught... And attaching that name to a deformed fish is an attempt to attach that innocence to it. Image the following conversation;

Child: "Dad, look at these. What are they?"
Dad: "It says here they are called 'Balloon Red Rainbowfish'."
Child: "A 'balloon' fish? Cool, can we get it?"


Balloon Boesemani Rainbow

But what is the cause of the balloon deformity, and why am I so against it being propagated? Fittingly enough, the balloon deformity was first seen in the freshwater species which was first kept in captivity, the goldfish (*Carassius auratus*). Essentially it is a deformity of the spine, specifically a shortening of the spine. This results in a shorter distance between the nose and the tail, resulting in a humped back appearance, with an accompanying "ballooning" of the belly. Internally, the organs are not formed properly, and this leads to problems, especially with a difficulty in expelling gases. This in turn leads to loss of equilibrium and uncontrolled floating. Further, the deformation of the body leads to slower swimming, and a difficulty in mating for the fish.

The deformity has been recorded most recently in Rainbowfish (I have seen tanks of both *Melanotaenia boesemani* and *M. incisus* offered for sale), but has also been seen (and unfortunately intentionally propagated) in mollies (*Poecilia sphenops*), kissing gouramis (*Helostoma temmincki*), pearl gouramis (*Trichogaster leeri*), German rams (*Mikrogeophagus ramirezi*), kribensis (*Pelvicachromis pulcher*) and several other species.

I note that I have never seen this deformity offered for sale at a Durham Region Aquarium Society auction, nor at any of the other aquarium auctions I have attended. However, it is becoming more prevalent in local aquarium stores. I would encourage every member of DRAS to be vocal in their revulsion of this deformity, and educate as many as you can about why it should not be kept. Stop and think about it for a minute. We care about the creatures we keep. Why would we want to encourage the keeping of a fish that from day one will suffer? Eating problems, swimming problems, mating problems... where is the joy of life for fish with this deformity?

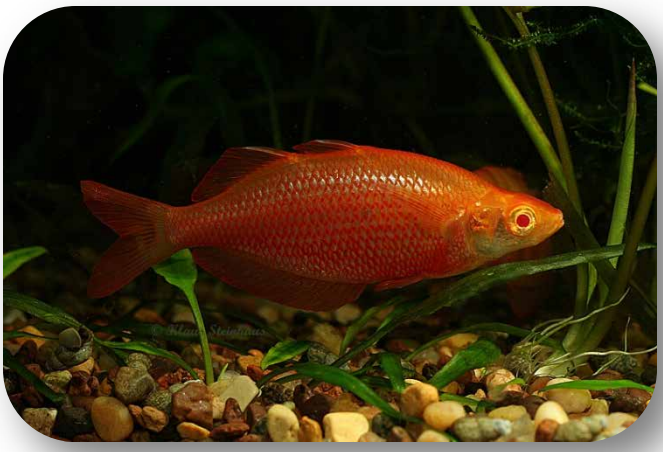
Albino Rainbowfish

So what about Albinos? I've spent a bit of time thinking about this very recently. About two years ago I posted on one of the Rainbowfish forums asking if anyone had ever seen or kept albino Rainbowfish. If I remember correctly, this thought came to me one meeting night when there was an abundance of albino bushy-nose plecos for sale. I had never seen albino Rainbowfish, so I asked if others in the community had.

I received several responses and a few people mentioned that they had seen one or two in someone else's tank, but had never kept them. The consensus was that they were extremely rare.

Albino Rainbowfish

About 10 months ago I saw (and bought) six albino Rainbowfish of an unidentified species from Big Al's in Whitby. They gave me an excellent price on them, but they were still very expensive. After getting them home, I posted several pictures that Klaus Steinhaus had taken onto the two Rainbowfish forums. The general agreement was that they were a *Glossolepis* species, most likely *Glossolepis pseudoincisus* based on the scales and general body shape, but as they were albinos and came without a pedigree, it would be impossible to know.



Albino Rainbowfish

And this is where albino Rainbowfish can cause such a problem in the Rainbowfish community. Unless you can be 100% sure of what species initially spawned the albino fish, it is useless to propagate unless it is only as an ornamental fish. In others words, if you want them because they look cool (and they do look really nice in a pond) and are not going to breed them for dissemination, go nuts. But if you want to use them as part of a species breeding program, trying to introduce albino genetics into a specific species, please do not try and do so. You will only be furthering an already confusing situation... (I would note to the breeders of the albino bushy-nose plecos in our own club that they too should be wary of this. PlanetCatfish currently lists 58 named species of *Ancistrus* and an additional 57 numbered species. When you produce albinos, what species are they exactly? Do we know if a person takes them home and introduces them with another species of *Ancistrus*? By doing so, they may well spawn albino bushy-nose plecos, but they are very likely going to be hybrids.)

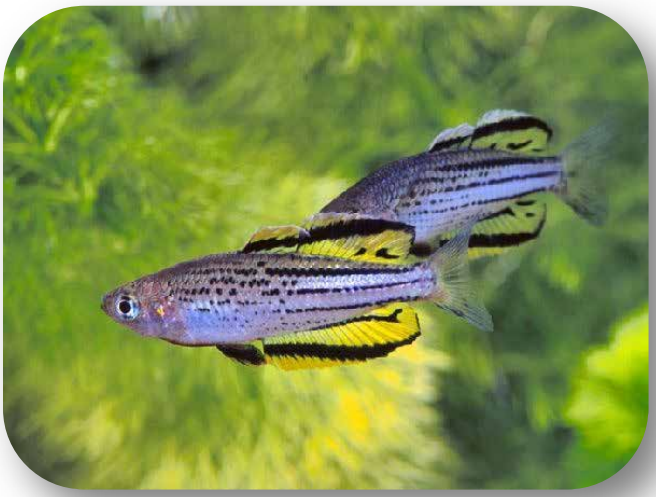
That being said, my personal experience with albino Rainbowfish is that they are not as hardy as other species. In fact, I have found them to be relatively delicate. They are interesting and, as mentioned, are great for pond keeping as they are more visible – much like goldfish or koi. One Rainbowfish keeper in the United States has reportedly bred them, but this is likely an anomaly, as all six specimens that I purchased were male. This only makes sense in the early days of this new variation as commercial breeders would prefer to keep themselves as the only ones breeding and providing them to the public and accordingly withhold females. Which brings me back to the original point – you might be tempted to breed them with regular fish of the species you *think* they are, but risk further polluting the genetic purity by doing so.

Genetic Purity – aka Rainbowfish Hybrids or "Mutts"

Which leads me to the concern of most breeders focused on Rainbowfish; genetic purity. If you visit any of the three main online forums devoted to Rainbowfish, you will find that one of the overriding concerns about acquiring any new stock is that they be "pure" and of an identifiable origin. Unfortunately over time and through questionable keeping, many of the strains of Rainbowfish in the hobby have become... well, the best word is polluted.

One of our club members purchased some *Chilatherina fasciata* 'Kali Biru' at the Canadian Association of Aquarium Clubs (CAOAC) annual show and auction in 2009. They were bred in Ontario by a reputable breeder of Rainbowfish. Anyway, our club member actually bid somewhat aggressively (irritating a serious Rainbowfish hobbyist from Ohio in the process) and acquired several fish. These fish were relatively new to the hobby, and the images of the "pure" strain are absolutely stunning. Now I had the chance to keep them over the summer last year, and I managed to breed a bunch, which I returned to our fellow club member along with the parents. They apparently are growing and looking really nice.

Last week I was in contact with the aforementioned Rainbowfish breeder in Calgary. He was sending me a small school of a rarer strain of Rainbowfish (for those interested), and we were discussing what was available for trade from my end. In addition to the species I currently keep, I mentioned the *C. fasciata* 'Kali Biru' that I could acquire from our fellow club member. My new friend chuckled a bit and went on to inform me that it had been determined via genetic testing that they weren't pure. The person who had collected them introduced them to the hobby via one of his preferred breeders, who had accidentally cross bred them with another similar strain of Rainbowfish.



Melanotaenia maccullochi 'Skull Creek'

So we have a breeder in London, Ontario who invested a lot of time and effort in acquiring, breeding and disseminating what he believed to be a pure species

Then we have a local club member who has a tank full of fry from some parents that he paid a pretty penny for.

Two people duped because of another person's error. And that's only the two people I know personally. Additional fry and eggs produced by the species in question were sent to other breeders in Canada and the United States. Don't get me wrong, they are a pretty fish, but they are now useless to maintain as a pure strain. Our club member could probably sell them to a local store, but what happens if a person new to the hobby gets them, thinking they are pure? Any offspring from that would still be mutts. His fish are mutts. If they were pure, they would be worth about $5.00 per fish at wholesale prices. Now they are maybe worth $0.50. Further, they are useless as the basis for a captive breeding or maintenance program (such as C.A.R.E.S.) because they are no longer genetically pure.

I use the story only to illustrate that one small error in maintaining a specific species can ruin years of effort on the part of numerous people. Unfortunately, it happens all too often. The large Florida "fish farms" have accidentally crossed some species, and intentionally crossed others.

Locally you will often see "Marci Rainbowfish" or "*Melanotaenia marci*" offered for sale. They look a lot like *Melanotaenia parkinsoni*, but are in reality an example of an intentional cross. The "Emerald Rainbowfish" you see for sale (and often labelled as *Glossolepis wanamensis*)? Another intentional cross. How about the "Crossing River Rainbowfish"? Very pretty, but yet another intentional hybridization.

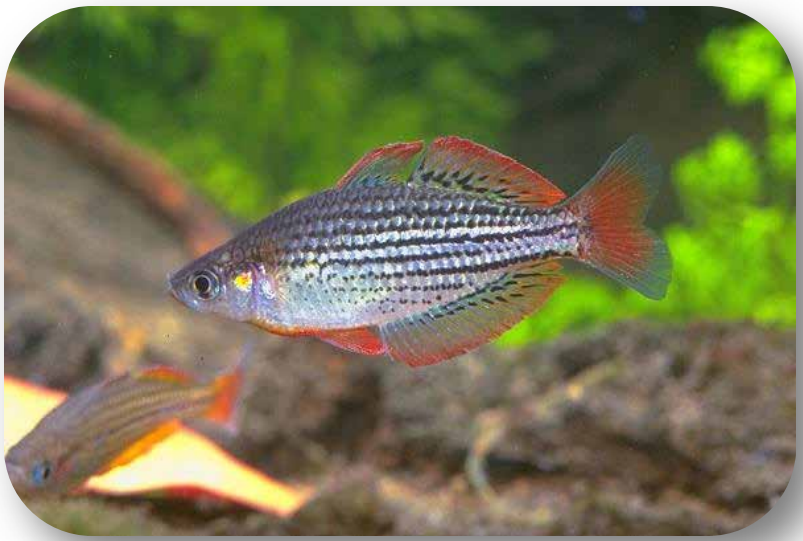
Rainbowfish in nature do not interbreed; from all the collections that have occurred only two hybrids have ever been found in native habitats. Further, studies have shown that even when fish from different species intermingle in a given natural body of water, they will only breed within their own species.

But put them into an aquarium and you have another story. Any male will breed with any female given the chance, and soon you will have multiple mutts swimming around. This is why I advocate keeping any species of Rainbowfish in a species only tank.

A lot of species of Rainbowfish look very similar (especially females of different species of *Glossolepis* and *Chilatherina*). If you mix them up, they will stay mixed up.

But keeping species only tanks doesn't only apply to a given species, but also different "tribes" within a species. The idea of "tribes" was introduced to me by Adrian Tappin in some personal correspondence, but it makes a lot of sense. There are a number of species of Rainbowfish that are found in different locations. Two of the best examples are probably *Melanotaenia trifasciata* and *Melanotaenia maccullochi*. To give a quick example;

Melanotaenia maccullochi 'Behana Creek'
Melanotaenia maccullochi 'Harvey Creek'
Melanotaenia maccullochi 'Hope Vale'
Melanotaenia maccullochi 'Hull River'
Melanotaenia maccullochi 'Johnstone River'
Melanotaenia maccullochi 'Moresby River'
Melanotaenia maccullochi 'Maria Creek'
Melanotaenia maccullochi 'Olive River'
Melanotaenia maccullochi 'Skull Creek'



Melanotaenia maccullochi 'Harvey Creek'

As you can see, while being recorded as the same species, the different tribes look remarkably different. As demonstrated by the list above they are found in numerous different streams and rivers, and over time, while still considered the same species, have come to look remarkably different as seen in the attached images. In fact, there is some evidence to suggest that not only do they look different, but that they are in fact different species altogether. As such, if you acquire stock that is identified as being from different locales, it is a good idea to keep them separate. By doing so, you ensure that if they are a different species, they will remain a distinct species rather than a hybrid, and even if they aren't different species, you will at least maintain the different appearance of the given tribes.

However, there is a downside to this as well. When most species of Rainbowfish are gathered, by necessity only a small number are able to be transported from the native habitat. As mentioned in previous articles this year, it is difficult to gather fish and then bring them out of the dense jungles of New Guinea. Therefore there is only a small genetic sample from which the breeding program will begin. Unfortunately over time this will lead to inbreeding. Inbred Rainbowfish can lose much of the stunning appearance, can be difficult to breed, and the

subsequent fry will be harder to raise. And even if you do raise fry from them, the succeeding generation will continue to present difficulties.

So why bother with genetic purity? Why not breed for colour and appearance? As mentioned by Klaus Steinhaus at our September 2011 meeting, habitats are disappearing all over the globe. One day (next century perhaps) these habitats will by necessity be restored. As Tom Mason mentioned, we will need to do so to ensure the very survival of humanity. So the habitats will return. If we can keep pure species, then when the time comes we can re-stock those habitats with something very close to what was removed. It will take a lot of effort to maintain these species, and we are only one link in the chain. But should we be lucky enough to have received pure specimens then it is our obligation to breed them and pass them on to another link who we know will help in their preservation.

This topic really isn't one that can be addressed in-depth in such a short article, but I did want you to understand that genetics in Rainbowfish is something that you will need to consider. You will see others (often large corporations) promoting deformities, mutations and hybrids, and selling them to all comers. To offset this pollution of true species, the serious Rainbowfish keeper will need acquire stock that they know to be genetically pure, and to breed and disseminate that stock to others to ensure the survival of the unique characteristics of the various species and tribes.

Melanotaenia Hybrid "Marci Rainbow"