# Buntbarsche Bulletin

Number 283
March 2015

THE JOURNAL OF THE AMERICAN CICHLID ASSOCIATION

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# CONTENTS

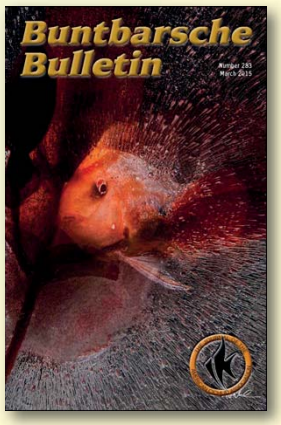


## On the Cover ▷

'Fish Spray' — Mo Devlin

The fish pictured is the new Albino *Acarichthys heckelii*. The image is a composite with one of Mo's collection of beautiful Frozen Flower photographs.

(No fish was harmed in the freezing process. ☺)




ACA Website: **cichlid.org**

# From the Editors' Desks

webslave@cichlids.org.au

*BB* will now only be published electronically. There's no denying it's the way of the future.

Actually, it has been the smart way for quite some time. The cost of publishing and delivering printed magazines has become horrendous. The money can certainly be put to good use elsewhere and electronic documents do have many advantages over print.

Not least among those advantages is readibility ... can't quite make something out ... zoom in! The opportunity to include electronic links also becomes available, saving the frustration of having to type sometimes quite long, error-prone urls.

Work is underway to complete the *BB* Electronic Archive, so you can look forward to being able to electronically search every edition ever produced. If you have attempted the alternative, you know only too well, that is what computers are for.

Without the very considerable restrictions that printing and postal costs force upon us, *BB* is effectively open-ended. It may go to a quarterly, but each issue can now be much larger.

The *Buntbarsche Bulletin* may seem to have a host of experts on-hand, but they do more than their fair share. Articles from "new blood" are very much needed and of great interest to all.

While the ACA is a large organisation, it is still an aquarium club whose members have a particular interest in cichlids. I for one, am looking forward to articles about your fish, your experiences with them and activities around them.

Thank you to all of the photographers/authors who have contributed to this edition, but please note that the two non-convention pieces by Rusty Wessel were written in 1977.

Thanks also to Claudia Dickinson for her invaluable assistance in the transition of the journal. I'm sure we all hope that she won't be moving too far up the back of the bus. Thanks also to Mo Devlin for taking on the advertising. Who else wants a little job to do?

I'll be MIA for a couple of weeks, so timely replies to e-mails won't happen ... but keep those submissions coming.

Regards,

Daryl Hutchins



In August 2005, Issue #229, I wrote my first editorial, From the Editor's Desk, humbled by the confidence that you had placed in me and so looking forward to doing my best at the job ahead. In that issue Al Klee, the man with the initial inspiration to form an American Cichlid Association, treated us to a quest for the red bay snook.

Since that time, we have explored the Amazon and its cichlid inhabitants with New World cichlid legend Wayne Leibel, had the *Paratilapia* species of Madagascar clearly sorted out for us by celebrated cichlid authority Paul Loiselle, discovered how we can be a part of protecting Malawi cichlids through anti-netting devices (ANDs) under the expert guidance of Ad Konings, and learned from lifetime cichlid aficionado Joe Ferdenzi how to create the perfect spawning caves and sanctuaries out of coconuts in the home aquarium.

We have taken an in-depth look at Lake Victoria haplochromines with Greg Steeves, Troy Veltrop, and Lawrence Kent, been given a mini series tutorial on culturing and feeding live foods by the man who wrote the book, Mike Hellweg, experienced a first-hand account of *Crenicichla celidochilus* by pike cichlid expert Vin Kutty, traveled to Lakes Malawi and Tanganyika as well as numerous ACA conventions, and so much more.

Thank you all so much for the kind support that you have shown me throughout the years. Working on BB has been such a privilege and brought me such great joy as well as many treasured friendships. The journal and the time I have shared with it and all of you will forever be a part of my heart. What great fortune I have had in this journey and the special memories that have been made along the way!

Today as we move into a new and exciting era of electronic publication, Daryl Hutchins has been so wonderful to step up and offer his experience and skills as the electronic editor of *BB*. How great it is to know that the magazine is in such excellent hands! I encourage you to please share your cichlid experiences with all of us by sending Daryl your articles. I know that you will offer him the same support that you have shown me. Thank you so much, Daryl, for taking this on and all my very best wishes to you!

A warm thank you to those who have so graciously contributed your exceptional writing and photography to *BB* throughout the years. Special words of heartfelt appreciation to Wayne Leibel and Paul Loiselle who have always been there for me. Also to members of the *BB* Team who have assisted and contributed their own remarkable articles.

For a final time, and as always, a most special and heartfelt thank you to you ~ our readers!

*Enjoy your Buntbarsche!*

Claudia

## The American Cichlid Association

**The American Cichlid Association, Inc is a tax exempt, not-for-profit Ohio corporation.**

**The mission of the organization is to:**

a) Gather, organize, and disseminate knowledge of the family Cichlidae;
b) Encourage and further the study and conservation of cichlids, in their natural habitats and in the hobby;
c) Encourage the study and preservation of cichlids by awarding grants for research and conservation;
d) Further the conservation of the natural habitats of cichlids;
e) Provide a means for individuals to acquire and distribute cichlids; and
f) Promote fellowship amongst the members.

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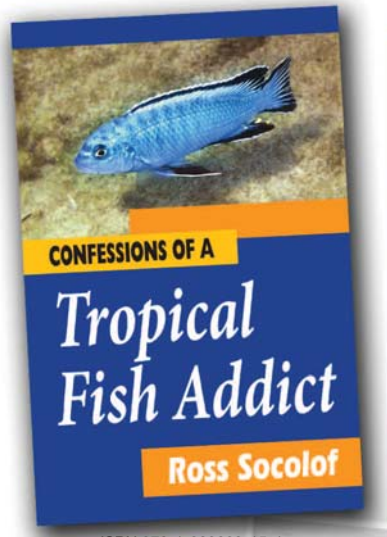


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# TEXAS CICHLID

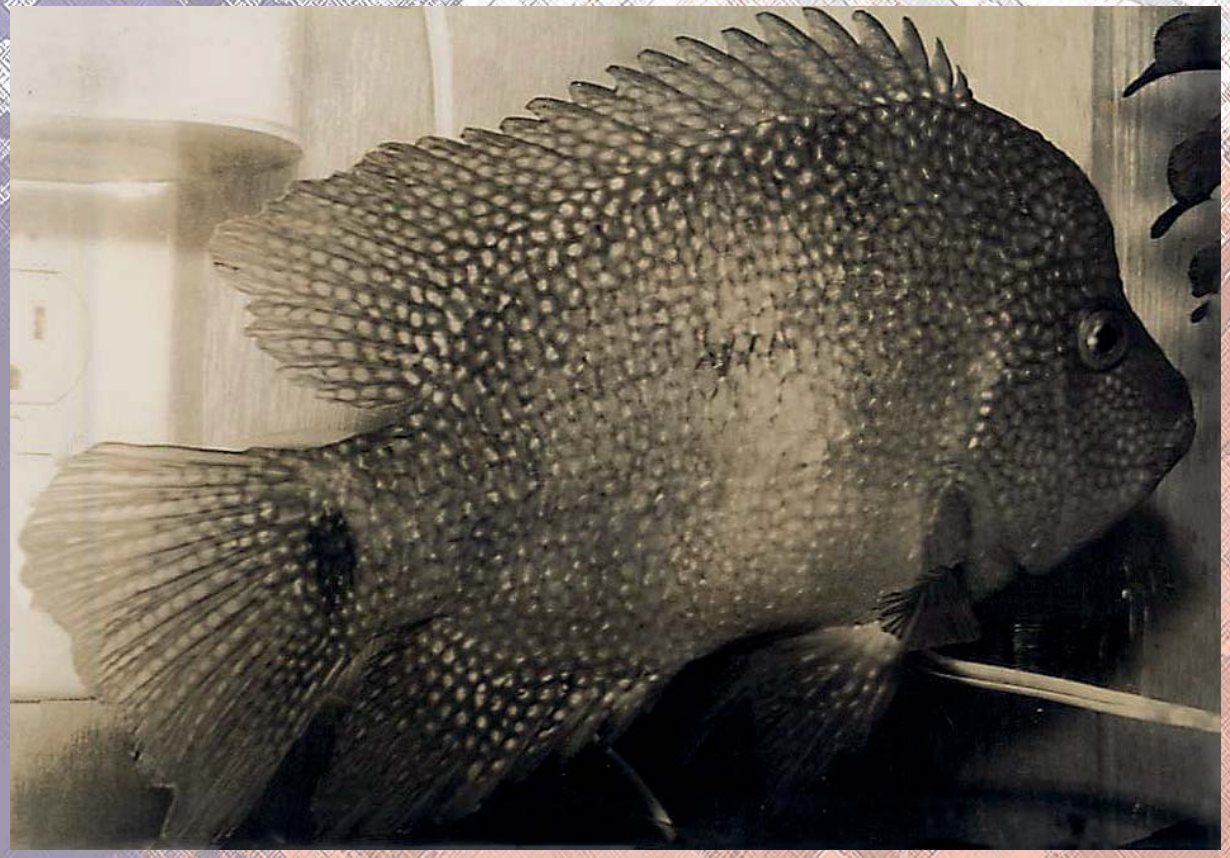
## ('Cichlasoma' cyanoguttatum)

By **Rusty Wessel** LTFF/ACA (1977)

Photos: Alan L Kelley

Early in August I found I had the privilege to do some fishing in Mexico with my father and two other guys from Alabama. After weeks of planning, we decided to start on the excursion the day after Christmas, December 26, 1977.

The type of transportation used was a mobile home. It was equipped with all the necessary furnishings. We pulled one boat behind us on a trailer hitch, while placing a smaller aluminum boat on the top of the Winnebago. I knew from past knowledge that many varieties of tropical fish do exist in the waters of Mexico and Texas. So I rooted through my fish room and came up with nets, buckets, bottles of Nova Aqua, and a Hush II air pump. Now I was set for any kind of fish collecting. I could only hope I would be able to catch some different varieties of tropical fish.



It took a long two days to reach the Mexican border at Brownsville, Texas. Our destination was Lake Vicente Guerrero, State of Tamaulipas, Mexico. Lake Guerrero lies about 170 miles south of Brownsville. The lake covers an area of 96,000 acres with a capacity of 5400 million cubic meters of water. It has been recognized as one of the best lakes on the continent. The lake is fed by the "Purificación", "Pilón", "Corona", and "San Carlos" Rivers. The warm weather year-round makes it possible for the black bass, catfish, and alligator gar to reproduce in great numbers. In its surrounds you will find an abundance of white-winged doves, ducks, geese, turkeys, and grouse. Many of the birds use the zone to reproduce in.

Upon our arrival at Big Bass Camp we were greeted by many friendly Mexicans. Travel was very slow for the roads were in desperate need of repair. The campground provided electricity, showers, and hot and cold running water. All of these came in handy when you plan to stay for a week or longer. The weather was very comfortable except when it reached the mid- to high-80s. The bugs were unbearable. At times I remember being almost completely covered by gnats and bugs of all sizes.

Well, now comes the good part. Once the boats were launched and the camp was made up, everyone was anxious to do some serious black bass fishing. Even I was glad to be fishing for bass, but my

main concern was for catching some tropical fish.

The lake was very beautiful. I noticed on the north-eastern shores there was a mossy plant that covered the entire bottom of the lake. The plant seemed to be very similar to Anacharis. The Mexicans referred to it as "Musgo". In places the plants were so thick you would think you could walk across it. I just wonder why the price of Anacharis is so expensive these days.

During most of the trip I used an Ambassador fishing rod. The first type of artificial bait I used was a top water spinner bait. After several casts I felt my pole bend. I roared back and knew I had a fighter on my hands. Once I had him close to the boat, my father grabbed a dip-net and netted him out of the water. My father lifted him into the boat and I could not believe what I saw.

It was a Texas Cichlid (*Cichlasoma cyanoguttatum*). It was a large male, 14" in total length. His height was 6" and he weighed a little over a pound-and-a-half. What a show fish this was. His cranial hump was about the size of a golf ball. I did not try to keep this particular fish because we still had an entire week to spend down there. So, I let him go.

After a hard day fishing from dawn to dusk we would return to Big Bass Camp. As exhausted as we were, there were still fish (bass) to be cleaned. The fish were laid out on a long table which was equipped for cleaning fish. It was very strange to see a dozen or so foot-long Texas Cichlids being cleaned by local fishermen. In my opinion the fish did not have enough meat on them to even bother with. Though the Mexicans baked the fish, head and all, over an open fire.

A common name for the Texas Cichlid is Rio Grande Perch. The Mexicans refer to them as "Nacauitas". The fishermen consider them a pest because they are not good for eating. Even though they may be considered a "pest", I did notice the bass feeding upon the smaller juveniles. The Texas Cichlid definitely brings a sparkle to the lake. It is a very impressive sight to see a school of adults lazily swimming and flashing their colors against the rays of sunlight.

All along the shores of the lake are hundreds and hundreds of green sailfin mollies. The visibility in the lake is unbelievable. In places it is 20 feet or better. On days that the wind was not blowing you could see the Texas Cichlids swimming deep down in the water just as plain as if they were in your home aquarium. It was rare to see just one individual alone. Usually they stayed in schools of eight or 10. December and January must be their spawning season because I caught many females with breeding tubes down.

In the clear water I was able to observe their breeding habits in the wild. A school of adults would clear away the mossy green plants in an area of about 4' by 4'. The nest consisted of one huge male with a large cranial hump, several sub-dominant males, and a half-dozen ripe females. I assume the fish remain in these nests until the fry are free-swimming and then move on and spawn again.

After seven days at the lake it was time to head home. A few days before we planned to leave, I started keeping any Texas Cichlids that were caught. After culling the bad ones out I had eight beautiful specimens left. Six of these beauties were placed in the live wells that are installed in our boat. The two prettiest males were kept in 5-gallon buckets that sat inside the shower room of the camper.

After getting the fish situated inside the camper I returned to the boat to prepare the others for the long haul home. I opened the lid on one of the wells and was shocked to find a four-foot water snake happily swimming with two of the nicer females. Disposing of the snake was no problem. Once that problem was eliminated the fish were packed and ready for the trip home. Once the camper was packed we were, on our way.

I changed a quarter of the water every day. A gasoline generator provided enough electricity to work the Hush II air pump. I ran two air outlets into each of the buckets, This worked out nicely but my biggest problem was the bitter cold that usually prevails in Kentucky during January.

Throughout Mexico, Texas, and Louisiana the temperature was around the 70°F mark. There was a slight drop in temperature as we left the coast and headed north. The temperature in Kentucky was much warmer than normal. I am very thankful for that because at the time of this writing the temperature is a mere nine degrees above zero.

I did not lose a single fish during the trip home. But I eventually lost two of them because they roughed each other up. I'm sorry to say that I don't have any dead photographs to show you. I must still be an amateur fish collector because all of the well-known explorers take hundreds of pictures of preserved specimens. Though I may be amateur, I did bring them back alive. Just come on over and take a look for yourself. ■

# Gut Symbionts of Tanganyikan Cichlids

By **Karen Sullam**

**(Guy D Jordan Endowment Fund Recipient – 2011)**

## Invisible Partners

Bacteria are present in all imaginable habitats on Earth, including within deep hydrothermal vents and in the extreme cold of the Arctic tundra. In addition to the diverse environments across Earth, microbes also use animals, including fish, as their habitats and take up residence in and on them. The presence and community composition of these microbial companions can markedly affect their host's biology.

Although fish are the oldest and most diverse group of vertebrates, most research to date has focused on the bacterial symbionts of humans and insects because of their applicability to human health and pest control. Fish, however, and especially cichlids, comprise diverse lineages that have evolved to utilize vastly different niches in the environment. This creates numerous opportunities to study how fish and their bacterial symbionts interact over evolutionary time.

With support from the Guy Jordan Research Fund, I focused part of my PhD studies while at Drexel University on investigating the gut bacterial communities of cichlids from Lake Tanganyika. Specifically, I explored how the diet, ecology, and evolutionary history of these fish species influence their gut microbial communities.

The shores of Kigoma Bay in Lake Tanganyika, where diverse fish for the present study were collected.

Photo: Catherine Wagner

## The Effect of Bacteria on Fish Health

Certain microscopic organisms are pathogenic, such as *Mycobacterium* spp. and *Aeromonas hydrophila*, which cause well-known diseases in fish such as Fish Tuberculosis and Hemorrhagic Septicemia. However, most microbial constituents on or inside of animals do not harm their host and instead are necessary for normal biological functioning. The microbial community on or in an animal can assist their host with certain functions, such giving cues for development, providing defense against pathogens and aiding in the digestion of challenging dietary material. Some scientists now consider an organism in the context of its "holobiome", meaning that both the organism's own genes and those of its symbionts may contribute substantially to the host's functioning (Zilber-Rosenberg and Rosenberg 2008). In sterile conditions, often a host fails to develop properly, illustrating host reliance on inputs from bacteria. For instance, zebrafish without bacteria fail to thrive and die young compared to those with normal bacterial communities. The failure of animals to develop properly without bacteria has been shown in diverse animal's hosts in addition to fish. For example, a polycheate worm that is a common bio-fouling animal requires bacteria to be present in order to metamorphosize (Huang, Callahan et al. 2012). This demonstrates that a fundamental aspect of their lifecycle is driven not only by the hosts' genome, but also by genes from bacteria.

As aquatic organisms, fish are immersed in an environment full of microbes and are perpetually exposed to different bacteria. Despite the vast diversity in the bacteria that exist in the environment, it appears that only certain microbes reside in or on fishes. In general, it also appears that more related individuals are hosts to more similar bacteria. Therefore, somehow the host selects for particular microbiota, which can also change depending on environmental conditions. For instance, when fish are brought to the lab, their microbial constituents appear to shift and become less diverse.

An exciting new line of inquiry in the field of microbiology and evolutionary biology is the investigation into how microbiota may be involved with an organism's adaptation to its environment. If an animal's biology changes over evolutionary timescales (for example, in relation to its diet), it may select for different types of bacteria in its gut that help break down new diet items. Additionally, if a host acquires new microbes that are beneficial, it would be in the best interest of the host to retain these useful microbes. Therefore, the host may evolve mechanisms to reliably obtain, retain or transmit beneficial microbial community members.

*Tropheus brichardi*, which is one of the focal algivores in the present study and eats algae by picking it off rocks.

Photo: Catherine Wagner

*Petrochromis 'kazumbe'*, which is the second focal algivore in the present study. Although it also eats algae, it does so by scraping it off surfaces with its many teeth.

Photo: Lesley Kim

Such dynamics may trigger co-evolution, so that fish adapt to become better hosts to certain microbes and the microbes adapt to life in association with the fish. However, complex dynamics occur in an organism's gut during certain circumstances that may shift the composition of microbial communities, such as during periods of stress or disease, as well as shifts in the host's habitat. We are just beginning to understand how the genetics and environment of a host interact and influence the structure and function of their microbiota.

## Exploring Cichlid Microbiota in Lake Tanganyika

Lake Tanganyika provides a natural laboratory for evolutionary biology and speciation, and it is a perfect setting to explore evolutionary dynamics between fish hosts and their bacteria. Multiple cichlid lineages have colonized the lake during its long history (9-12 million years), and some of these lineages have diversified into a beautiful variety of forms, in many cases dramatically shifting their diets during the process of adaptive radiation. Sampling a multitude of species within the same ecosystem is a boon to studying the factors influencing fish microbiota, because it removes the confounding effects of geography that result when sampling species from multiple lakes. In very few places on earth is it possible to sample from such a diversity of closely related species, which makes Tanganyika the ideal place for this type of research.

For this study, I am examining the gut bacteria of 26 cichlid species with diverse diets that have been provided from Dr Peter McIntyre's collections. Some representatives of the sampling include a scale-eater (*Perissodus straeleni*), zooplanktivores (*Neolamprologus walteri, Cyprichromis leptosoma*, and *Haplotaxodon microlepis*), benthic invertivores (*Tanganicodus irsacae* and *Telmatochromis popelini*), a fish-eater (*Neolamprologus furcifer*), general carnivores that eat invertebrates and fish (*Neolamprologus fasciatus* and *Lamprologus lemairi*), and algivores (*Eretmodus cyanostictus* and *Simochromis marginatus*). In order to see how unique the microbial communities of cichlids are, I also sampled six non-cichlid species that are found in the same habitat as cichlids, including an algivorous catfish (*Synodontis polli*), a zooplanktivore poeciliid (*Lamprichthys tanganicanus*), a fish-eating Nile perch (*Lates microlepis*), and a benthic invertivore catfish (*Lophiobagrus cyclurus*).

Through this study, we will determine if microbial communities co-diversify with their hosts, or if they shift in response to their hosts' diets. Our preliminary analyses show patterns indicating that fish with different diets host highly distinct microbial communities, and we are working to tease apart dietary differences from phylogenetic differences. There are some examples of dietary convergence in our dataset, where more distantly related hosts have more similar diets. These cases will help us determine how both phylogeny and diet impact gut microbial communities. Because the evolutionary relationship of the hosts has been explored in previous studies, we will also explore if the signal of evolutionary history is maintained in the gut microbiota despite dietary diversification.

Aside from assessing how diet affects gut microbial composition, we are also interested in how microbial communities could vary among closely related species that are sampled from different sites in the lake. Two different algivores, *Petrochromis* sp. "kazumbe" and *Tropheus brichardi*, were also collected from eight sites in the region surrounding Kigoma, Tanzania. Even though both of these species eat algae, they do so in very different manners. *P.* sp. "kazumbe" consumes algae by scraping the surface of rocks with hundreds of tricuspid teeth, while *T. brichardi* picks algae with a straight line of unicuspid teeth. This part of the study will allow us to examine more closely how gut bacteria vary among populations within a species. Is host species identity or environmental location the predominant factor in determining the gut bacterial communities of these fish?

A fish community composed of many fish that have different diets as well as different gut bacterial communities in one of the sampling sites around Kigoma Bay.

Photo: Ellen Hamann

Asking such questions will lead us to a better understanding of how bacterial communities are established and retained in the guts of fish.

Existing knowledge about cichlid diets and evolutionary relationships among species enable us to focus on differences in physiology and gut bacteria among cichlids from various feeding regimes. Tanganyika cichlids provide a unique opportunity to compare fish hosts that have independently evolved diverse diets.

## Possible Mechanisms of Inheritance

In order for hosts and their microbes to exhibit co-diversification, mechanisms of transmission must exist so that individuals pass on their microbes to subsequent generations. Many questions remain about how microbes are transmitted among fish. The complex behaviors and interesting life history strategies of cichlids may be important here in providing opportunities for transmission of microbes via vertical (to hosts' offspring) and horizontal (to hosts from either the environment or non-parental hosts) means.

Fish are known to acquire their microbes from their environment, including their food and surrounding water, but there are also some potential avenues through which bacteria could be passed within and between individuals of the same population. Cichlids may pass their microbes to the next generation through parental care. For example, during mouthbrooding, microbiota could be passed to young. Tests of this transmission line could be investigated experimentally by rearing offspring in the lab. Nest-care behavior also provides close quarters for possible transmission of microbes between parents and offspring. Interesting behaviors of juveniles, previously described as contacting, micro-nipping or parent-touching by Noakes and Barlow (1973) could be an important mode of microbial transmission. There has been speculation that such behaviors are a way for fish to acquire mucus as a source of sustenance, but it could also serve as a mechanism for bacterial transmission, which may be vital for growth and development. Overall, there is much work to be done to better understand how and which microbes colonize their animal hosts, and well-designed experiments would enable a more explicit exploration of these possible transmission routes within cichlids.

## The Future of Cichlid Microbiota

Our analyses suggest that the cichlid microbiota is extremely diverse and is composed of approximately 24 different major evolutionary groups of bacteria. It appears that the microbiota of fish species that have different diets are strongly divergent. In addition, gut microbes of fish strongly diverge among sampling locations within the same species. Therefore, cichlid gut microbiota appear to be complex and shaped by a number of factors including habitat, diet and evolutionary history. This is the first work to address the complex communities of bacterial associates that inhabit cichlid guts of Lake Tanganyika.

Although we are just beginning to understand the standing diversity in the guts of cichlids, there is much to learn about their function not only in relation to dietary differences but also to fish health and disease. Previous research in other animals indicates that microbes are also involved in relaying and intercepting signals to and from their hosts that affect host functioning. Such signaling pathways can result in changes in host metabolism and fat storage, which may help animals adapt to situations in which there is uncertainty about food availability. Additionally, over time, it is possible for genetic elements of microbiota in the environment to be transferred to their gut microbial symbionts. In a Japanese human population, it has been found that a gene assisting in the digestion of seaweed, found previously only in marine bacteria has been acquired by their gut microbiota (Hehemann, Correc et al. 2010). Therefore, the interconnections between host and gut bacteria can have profound consequences and studying genomes and gene expression may help elucidate such connections.

Sunset over Kigoma Bay, Lake Tanganyika.
Photo: Ellen Hamann

The availability of new technologies for genetic analysis is increasing rapidly, and at the same time the costs of such methods are decreasing. As more data become available, our understanding of how microbial communities are shaped and how they contribute to their hosts' biology will be enhanced. Tanganyika cichlids are a powerful study system for evolutionary biology and have helped elucidate a number of complex biological questions regarding speciation, sexual selection and convergent evolution. The combination of using such an extraordinary system with advances in genetic sequencing technologies will help us gain a better understanding of how microbial symbiosis changes over time and geographic distance.

**REFERENCES:**


Hehemann, J-H, et al. (2010). "Transfer of carbohydrate-active enzymes from marine bacteria to Japanese gut microbiota." Nature 464(7290): 908-912.

Huang, Y, et al. (2012). "Recruitment in the sea: bacterial genes required for inducing larval settlement in a polychaete worm." Sci. Rep. 2.

Noakes, D and G Barlow (1973). "Ontogeny of parent-contacting behavior in young Cichlasoma citrinellum (Pisces, Cichlidae)." Behavior 46: 221-255.

Zilber-Rosenberg, I and E Rosenberg (2008). "Role of microorganisms in the evolution of animals and plants: the hologenome theory of evolution." FEMS Microbiology Reviews 32(5): 723-735.

# Spawning *Tropheus duboisi*

Photo: Manfred Werner CC-BY-SA-3.0 via Wikimedia Commons.

By **Rusty Wessel**

ACA, LTFF (1977)

As my interest in Rift Lake cichlids increased, there was one cichlid which I could not pass-up. This being *Tropheus duboisi*, an aggressive mouthbrooding cichlid from Lake Tanganyika, which grows to about six inches in length. Juvenile and adult have completely opposite color patterns. Mature *T. duboisi* are black, with a whitish band running vertically through the body. The young are black and have numerous white spots spread over the entire body. *Tropheus duboisi* are one of the few African cichlids that still demand a high price.

I was lucky enough to purchase three young adults at a very reasonable price. The three fish had already lost their spotted, juvenile traits and began to show a white cross-bar. They were placed in a 30-gallon with plenty of rockwork. Their diet consisted of brineshrimp, ocean plankton, TetraMin, and plenty of Duckweed to munch on throughout the day. A Grolux bulb left on 24 hours a day provided plenty of light and algae. A 425 Dynaflo filter kept the water clear of debris. The temperature was kept at a steady 77ºF and the pH was 7.5.

Within a couple of weeks, I noticed one of the *Tropheus duboisi* had a breeding-tube down. I gradually raised the temperature to 80ºF, changed one-third of the water and added aged tap water with Lake Tanganyikan salts. After 24 hours the largest one of the three started making quivering motions toward the female who had her breeding-tube down. The extra *Tropheus duboisi* had to be removed to a small recovery tank to be treated for several bite wounds that came from the dominant male.

Late that night the pair were constantly chasing each other in circles. After several times tossing and turning, the female ejected one large, oval-shaped egg. The male quickly followed and fertilized the egg. The female then gently picked-up the egg in her mouth. This process recurred for several hours until the females buccal cavity was bulging with several eggs. I then placed an opaque plastic divider between the pair and patiently awaited the long incubation period. A flowerpot was added to give the female a dark and secure place in which to hide.

My *Tropheus duboisi* female ate regularly during the incubation period. After 35 days of brooding, the female released five (3/4") fry. This small number of fry is an average spawn for any Tropheus species. The fry were fed baby brineshrimp and crushed TetraMin.

*Tropheus duboisi* have been one of the most interesting cichlids I have ever successfully spawned. The only problem with them is their nasty habit of chewing one another up. Once they begin to spawn, the dominant fish tries to make a sizeable meal out of any other specimen in the tank. So all you "cichlid nuts", watch out when you come across any member of the Tropheus genus. ■

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# A question Mr Heckel: Who is Really Your *Heros severus*?

By **Peter Dittrich**

*Heros severus* adult in the aquarium.
Photo: Uwe Werner

**Recently, I have published in the German *DCG Informationen* an article on a local form of the mouthbrooding *Heros* from Rio Inirida (DCG-Info 9/2013). At that time, I believed – like many aquarists and authors – that this is *Heros severus*. Meanwhile, I have checked the original description and noticed a tiny, but perhaps essential detail.**

## On the identity of *Heros severus*

Johann Jacob Heckel (1840) described 13 cichlids referable to the genus *Heros* established in the same work, among them *Heros severus*. Over the years, several of those species have been transferred to other genera, so that only seven species remain.

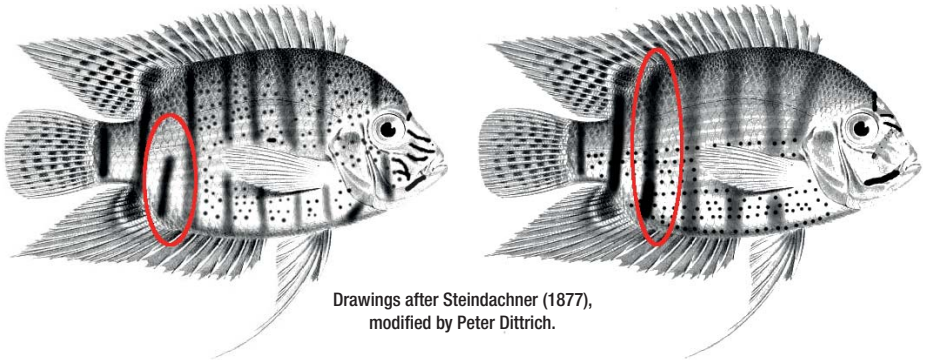
What exactly did Heckel write about *Heros severus*? Here is an extract from the original description (note: Heckel counted the bars – contrary to the current method – from the anterior to the posterior): "On the whole, there are nine black vertical bars on each side … The first of those bars runs from the occiput to the eye; the second lies before the dorsal fin and reaches to the gill slit; the 3rd and 4th reach from the dorsal fin down to the belly; the 5th, 6th, and 8th connect dorsal and anal fin, so that the last one, which lies at the end of the bases of both these fins, partly extends onto the fins, the 7th bar is only half and reaches just from the anal fin upwards to the lower lateral line, the 9th encircles the root of the tail."

Concerning the arrangement of bars, this description does not fit to the animals we currently name *Heros severus*. Particularly remarkable is the statement about the "half" 7th bar!

If the mouthbrooder should be the true *H. severus* and occurs demonstrably, e.g. in Rio Atabapo, the second *Heros* species occurring syntopically with the mouthbrooder in the Rio Atabapo could theoretically likewise be the true *Heros severus*. Because: Is there anywhere a proof that the mouthbrooder occurs at Marabitanas, the type locality on the Rio Negro? I know of none.

On the contrary: all collecting localities of the mouthbrooder published so far are situated not in the Rio Negro, but in the Orinoco drainage. This is a little bit strange, isn't it?

BUT there is a *Heros* that has been found near Marabitanas, namely in the Rio Uaupes, which flows about 130 km



Drawings after Steindachner (1877), modified by Peter Dittrich.

Drawing of *Heros severus* with half-bar.

Drawing of mouthbrooding Heros with complete bar.

*Heros severus* fieldshot with half-bar.

Photo: Roland Rietsch.

*Heros sp Casiquiare* fieldshot with complete bar.

Photo: Roland Rietsch.

below Marabitanas in the Rio Negro. And, dear reader, do you guess what THIS ONE has? Yes, exactly: That dratted "half" 7th bar described by Heckel!

Uwe Römer (1998) was the first to publish a picture of a half-grown *Heros* from the Uaupes. It shows the half 7th bar. Obviously, this did not change when the fish was full-grown. It still reached to half the body height.

Wolfgang Staeck photographed in 2006 at the Rio Casiquiare, thus in a tributary to Rio Negro above Marabitanas, a *Heros* – with the half 7th bar! And Roland Rietsch (2012) proved by means of underwater photos from Rio Atabapo that two different *Heros* live there together: the mouthbrooder – and a *Heros* with a half 7th bar.

In January 2014 Roland Rietsch visits the Rio Casiquiare again, he takes some underwater shots of different *Heros,* he has proven my Idea. The pictures show that the different *Heros* populations *Heros severus*, *Heros* sp. Casiquiare and the "Mouthbrooding" – *Heros* swim separately from each other but in the same habitat. He has found the mouthbrooding *Heros* at more places than the two other species. This could be the reason why Stawikowski saw the "Mouthbrooding" *Heros* as the real *Heros severus*. (But this is only speculation from me.)

One might argue now, that Heckel had but a single specimen (a very large one, though) at hand for the description of the species. Furthermore, it is known that the vertical bars can be deformed in almost all *Heros* species, especially in the posterior part of the body. Perhaps Heckel may have accidentally obtained such a specimen with deformed bars?

Deformed bars are frequently encountered in aquarium-bred fishes, but they are also recorded from wild-caught specimens. In all of these cases, however, the deformations are very uneven and irregular: Once longer, once shorter, once in a different angel, once other or even several bars. They differ from animal to animal, but also from one side of the body to the other in the same specimen.

Another unknown Heros from the Atabapo River. Photo: Peter Dittrich.

The phenomenon in the records listed above (Uaupes, Casiquiare, Atabapo) is, however, that the 7th bar has always the same length, and this is 100 per cent as-described by Heckel! Do you consider this a coincidence?

Another fact: in the last paragraph I wrote intentionally that deformed bars occur in **almost** all *Heros* species.

Meanwhile, almost 20 years since the first introduction of the mouthbrooding *Heros* to Germany, there are probably thousands of aquarium-bred fishes and hundreds of photos of the species. Furthermore, wild-caught fishes from different localities have been consistently imported. Neither I nor the aquarists interrogated by me know of a single fish of this species showing any deformed bars. On the internet, however, I found a single photo on a Russian page showing a fish with irregularities on two bars in

the posterior part of the body ... just a single photo.

And another fact: in addition, the statement that the mouthbrooding *Heros* was *Heros severus* has never been confirmed scientifically. At least, I know of no published information by ichthyologists, which would prove the claim by Stawikowski (1995) hanging in the air ever since (which by the way, came as a real bombshell then).

Of course I am not able to give a scientific reasoning; this is completely beyond my capabilities. It is, however, possible for me to furnish and to evaluate circumstantial evidence, which I have done herewith – and this speaks a clear language in my view:

A mouthbrooding Heros. Fieldshot.
Photo: Roland Rietsch.

1. The mouthbrooder from the Upper Orinoco drainage is not *Heros severus*.
2. There are many indications for *Heros* sp. 'Uaupes' being the true *Heros severus*.

Therefore, until the identity of the mouthbrooding *Heros* is clarified I suggest herewith referring to this species as *Heros* sp. 'Mouthbrooder' in the future. Another mouthbrooding species of this genus is obviously not known in the hobby; hence, this denotation should be informative and at the same time unambiguous.

## And *Heros severus*?

Either we currently (as far as we know) have no fishes of this species or we follow my line of evidence and use the name *Heros severus* for *H.* sp. "Uaupes". It wouldn't be the first correction.

**Acknowledgements:**

I thank Roland Rietsch, Wolfgang Staeck and Uwe Werner for providing photos. I am indebted to Lutz Krahnefeld for proofreading and "bringing into shape" the manuscript. I thank Rico Morgenstern for the translation from German to English.

### References

Dittrich, P (2013): Heros severus "Inirida Rot" Eine schöne Farbvariante des maulbrütenden Augenfleckbuntbarsches. DCG- Informationen 44(9): 310-314.

Heckel, JJ (1840) Johann Natterer's neue Flussfische Brasilien's nach den Beobachtungen und Mittheilungen des Entdeckers beschrieben (Erste Abtheilung, Die Labroiden). Annalen des Wiener Museums der Naturgeschichte v. 2: 325-471, Pls. 29-30.

Römer, U (1998): Cichliden Atlas. Band 1.Mergus Verlag, Melle. S. 28 und S. 245.

Staeck, W (2009): Die Buntbarsche der Gattung Heros 2. Teil. AF 207: S. 40-45.

Stawikowski, R (1995): Heros. 2. Die Typusart ist Maulbrüter. DATZ 48 (7): 422-427.

Steindachner, F (1877) Die Süsswasserfische des südöstlichen Brasilien III. Wien, Gerold (In: Sitz.Ber. d.Akad.d.Wiss., Math.-Nat.Kl. Wien, Abt.1; Bd.74, Heft 4). 8vo. S.559-694 mit 13 lithographischen Tafeln. ■

*Heros severus*, Atabapo River.
Photo: Roland Rietsch.

# HELP NEEDED!

## ACA Committee Chairs Open!

Volunteers needed urgently to fill the positions of:

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**Put your hand up!**

contact ACA Chair, Chuck Rambo:
mr.charles.rambo@gmail.com


## Thank you for attending ACA-CON!

During their visit to the "fish house" Convention attendees got to see the following.

The fish house was constructed about 10 years ago specifically for the housing of tropical fish.

There are 90-plus aquariums full of cichlids and livebearers! The house is heated and cooled geo-thermally by the addition of three loops which travel 250 feet down into the earth whereby they collect the warmth in the winter and the cold in the summer to optimize fuel consumption.

There are 52 windows which allow natural lighting conditions. The designer (Tim Rohleder – Architect) in Seattle designed the most efficient use of light. The windows allow the light to transfer in levels across the tanks, so lighting is different as the sun travels across the building. There are also six light collectors that point in the directions of the tanks that allow a transfer of the light from the roof to several sections of the room.

An automatic water changing system was installed by Dan Woodland which automatically changes water in the large display tanks each day for about a 5% water change per day and the smaller tanks (fry) get a twice-a-day change for a 10% water change daily.

### 2014 ACA Convention Louisville

July 10-13, 2014

Thank you for your participation with this past year's ACA convention in Louisville, Kentucky. Because of your support and help the convention was a huge success. Here are a few statistics about the event.

- 555 Registrations
- 437 Aquariums set up
- 20 **Junior** Registrations
- 169 Fish and Art Show Entries
- 230 attendees at Banquet
- 35 Vendor Tables
- 741 Room Nights Sold at Hotel
- Over 1000 items in the Dry Goods and Fish Auction
- Over $7000 donated to Endowment Funds for the ACA.
- Most Attendees claim it was the best convention they have ever attended. It was also the largest profit to date for ACA.
- United Pet Group and the BABES should be applauded for their continued support!

Bill Merkley, myself and the Louisville Tropical Fish Fanciers (the host club) and the American Cichlid Association, THANK YOU for your confidence in our organizations and hope you plan to attend next year. The date for next year is July 30 to August 2, 2015 in Springfield, Massachusetts (ACAconvention2015.com).

Cheers,

Rusty Wessel

Most of the fish in the fish house were personally collected by Rusty and some of them have been maintained in captivity for many years. The Tropheus colony (Limespots) have been in an existing colony in Louisville since 1982 (33 years and counting).

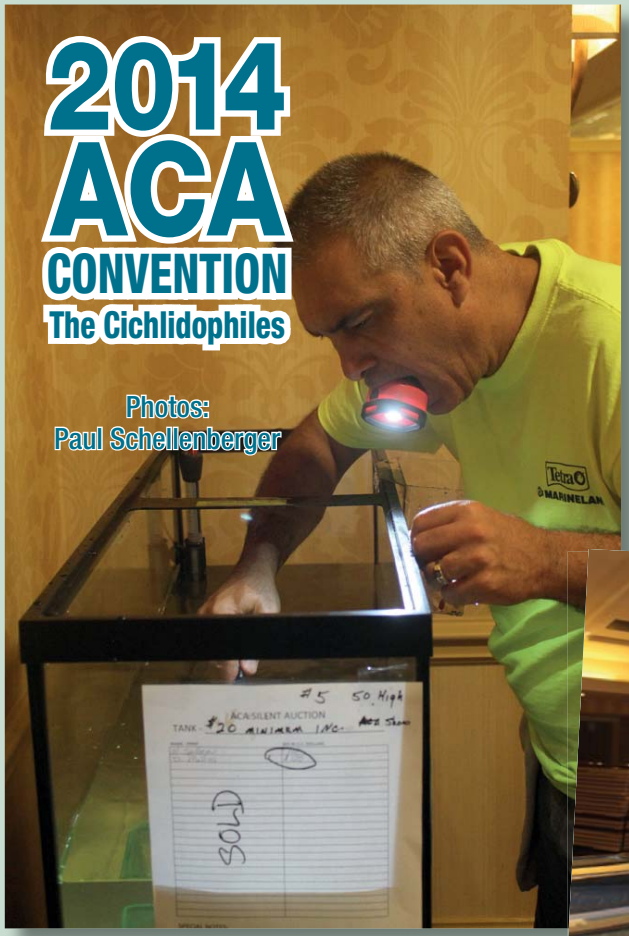
The entire building is controlled by one thermostat and the temperature is maintained consistent with the temperature of Central America. This is an effort to mimic the natural conditions in the wild for the fishes. During the winter months the temperature drops to about 70°F, which places the fish in a slow pattern whereby they continue to eat, but they do not breed. Then, each spring the temperature is gradually raised over a period of weeks to a warm 82°F. This is the optimal time to visit the house because many of the cichlids will be breeding. You should be able to find over 30 pairs with fry or eggs at this time of year. Look closely and watch the adult fish's behavior! It is easy to tell if the fish are breeding.

There are also five outdoor ponds on the property ranging in size from a 100,000 gallon dirt pond to a 500 gallon liner pond. The dirt pond has mosquito fish, Koi, paddlefish and albino channel cats. The smallest liner pond has Yucatan mollies and Clemenica swordtails. The largest concrete pond contains Otapa (*X. helleri*) swordtails, Koi and paddlefish and this pond also serves a secondary use as a true swimming pool. Aquatic plants including Lotus, hardy water lilies and other aquatic plants can be found in and around the ponds. ▶▶

# 2014 ACA CONVENTION

## The Cichlidophiles

Photos:
Paul Schellenberger



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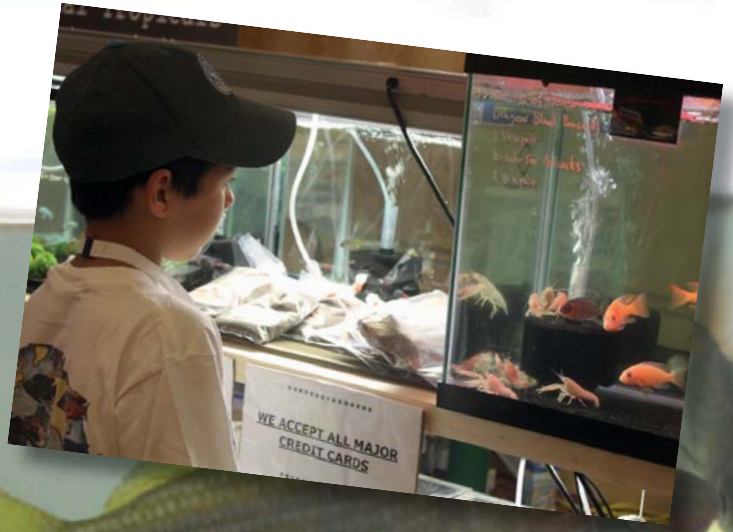
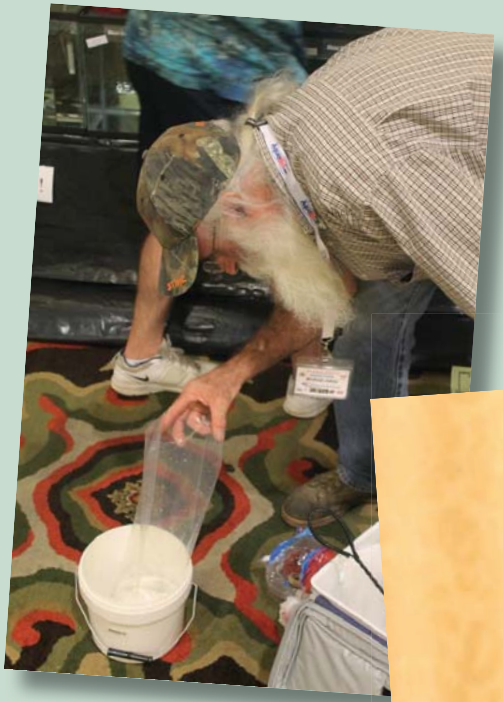







# 2014 ACA CONVENTION

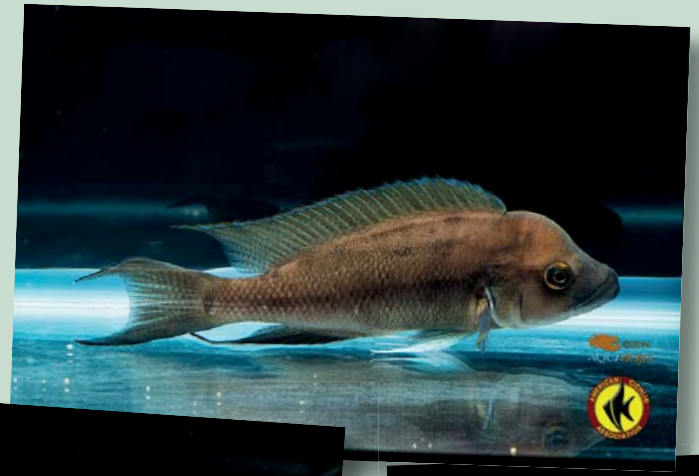
## The Cichlidophiles

Photos:
Paul Schellenberger

# 2014 ACA CONVENTION

## The Cichlids

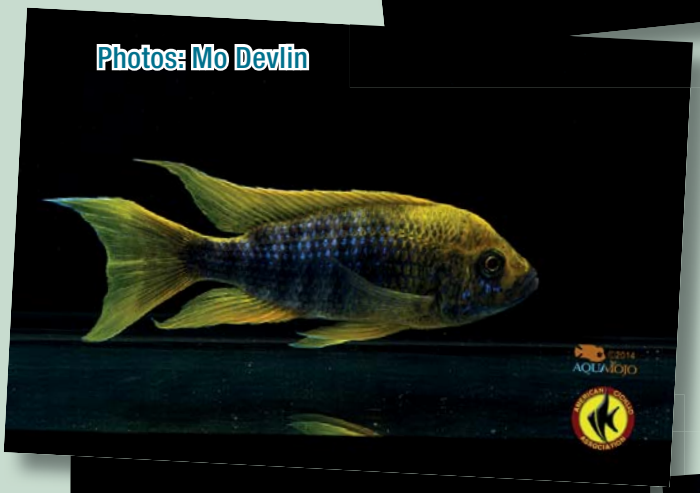
Photos: Mo Devlin

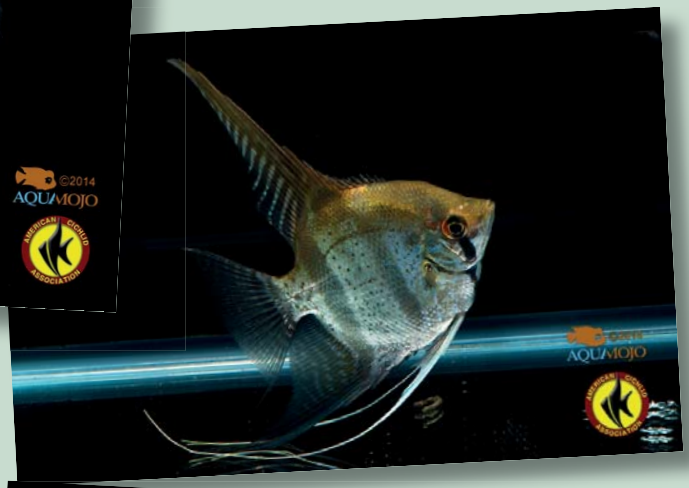


# 2014 ACA CONVENTION

## The Cichlids

Photos: Mo Devlin




*Can't wait for the next one!*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