

CICHLID TAILS

The Official Newsletter of the Texas Cichlid Association

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TCA was represented by John, Larry Lambert, and Gary Cooper, the lowest attendance by TCA members in over 15 years. Let's all make plans to be at ACA 2010 in Milwaukee next summer.

FOTAS is September 11-13 in Houston. Speakers are Spencer Jack, Charles Hawks (Angelfish Breeding & Genetics), Greg Steeves (The Plight of Lake Victoria's Cichlids), and Dave Hansen (Aquarium Photography). In addition there will be a mystery speaker Friday night and a huge all fish auction on Sunday. Be there or be square.

At the August meeting several new plans were laid out for the coming months: (1) a Grow-Out Contest to see which club member can grow supplied fish the largest by a deadline. Watch for Jim Hall's details on the rules and how to enter; (2) The TCA Christmas party will be December 12 at Spring Creek Barbeque on Hwy 183 in Bedford, the same place as last year; (3) The January meeting will be at the same restaurant as the Christmas Party and Officer and Board elections will be held. If you are interested in running, just let it be known. Every club member is free to nominate themselves; (4) We hope to have the February and March meetings at the same school where we met earlier this year. Details coming soon; (5) Marvin England and John Hansen are putting together plans for a collecting trip in May or June. If you have ideas about this, get in touch with one of them.

It was suggested that the club start having its Spring Show & Auction on the fourth weekend of April annually. We hope a fixed date will let hobbyists here and across the country make plans to attend each year. The Fall event will probably be an auction only event, with the possibility of a swap meet at the same time. The board will need to approve these plans, but it seems likely that will happen. That would mean this Spring's Show/Auction will be on April 23-25. Details will be reported as they become available.

If I left anything out, I apologize in advance. See you at FOTAS September 11-13, and then at the Hilton Garden Inn for our show October 23-25.

Ralph

Ralph's Rumors

If you missed the August Pool Party at Diane and Mike Stewart's, you made one big mistake. Had you been there, which of the following do you think you might have seen: (a) Kathy, Diane and the other girls swimming in their string bikinis; (b) Marvin eating a raw Discus; (c) An invasion of Cyclops-looking varmint in Diane's reef tank; (d) David Andrews; (e) a TCA birthday cake. First person who did not attend that gets it right (without talking to an attendee) wins a prize. On a more serious note, we did have a great time. This annual event is always one of my favorite things we do in the club. Lots of good food and visiting - thanks, Mike and Diane.

We had good attendance and made many plans for the October Show & Auction. Speakers will be John Hansen (So You're Thinking About Opening A Fish Shop); Mike Wise (Apistogrammas); and Don Conkel (Topic TBA). Don, of course, is a major fish farm owner from Florida. One important change this time is forgoing the banquet and have an awards ceremony after our Saturday speaker presentations. Also, there will be no rental tanks, but out-of-town attendees can call Alan Young to arrange for a limited number of "holding tanks" for fish to be sold in Sunday's auction. No sales will be allowed out of these tanks, which will be provided free by the club.

John Hansen reported that the ACA Convention in Cincinnati had somewhat low attendance, apparently due to the economy.

CICHLID TAILS

Cichlid Tails is a bi-monthly publication produced by and for the members of the **Texas Cichlid Association**, a non-profit group of hobbyists dedicated to furthering the aquarium hobby and promoting the practice of keeping cichlids by the dissemination of information. Published since 1983, **Cichlid Tails** is dedicated to sharing technical and educational information on the keeping of the fishes of the family **Cichlidae**, and the keeping of aquariums and aquarium fish in general.

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TCA's website: www.texascichlid.org

EDITOR'S NOTES

Summer is almost gone, and with the lengthening days comes the return of the school year. Be sure to watch your speed when traveling through school zones. You know you would rather spend your money on fish and fish stuff than on a traffic ticket!

Big fishy things are coming up in the next couple of months. FOTAS, hosted by Houston Aquarium Association, is September 11-13. The HAS gang has an outstanding lineup of speakers, and you know we always have a great time down there! Registration, show, and hotel information is on the HAS website, so run over and take a look. Deadline for receiving the special FOTAS hotel rate is September 3, so book that room now!

The Oklahoma Aquarium Association has scheduled a workshop and auction for October 10-11 in Oklahoma City. This bunch is hosting FOTAS next year, so we should all make an extra effort to attend their presentation and help out wherever possible. Their website will be updated as more information becomes settled.

TCA has scheduled its fall workshop, show and auction for October 23-25 in the same hotel where the spring auction was held. A great speaker lineup is set, plus you don't want to miss the "Meet and Greet the Speakers" Friday night. Come on out and mingle with the rest of the fish nuts that will be in attendance. Special hotel room rate is \$75 - what a deal! Make your reservations now before it's too late.

TCA's annual Christmas Party has also been scheduled - for 7:00 on December 12th at the same location as last year. Hopefully Marvin and I will have better luck finding it this time. See you there!

Happy Back to School!

Kat

FOTAS LVIII

The 2009 Federation of Texas
Aquarium Societies Convention
sponsored by
HOUSTON AQUARIUM SOCIETY
at the beautiful
OMNI HOUSTON HOTEL WESTSIDE
13210 Katy Freeway
Houston, Texas
(281) 558-8338

Speakers include Spencer Jack, Charles "Chuck" Hawks, Greg Steeves and Dave Hansen. An all-species show will be held, with show winners being acknowledged at a Saturday night Italian-themed banquet. A huge auction will be held Sunday. T-shirts and rental tanks will be available.

Show entries must be received by September 7th. You must call the hotel directly to reserve a room at the special rate of \$85. Deadline for receiving the special rate at the hotel is September 3rd. FOTAS registration and auction forms are now available on the HAS website.



For more information, visit the HAS website.

Falling Fish Shatters Ohio Driver's Windshield

Ohio Woman Says Her Windshield Smashed When An Eagle Dropped Fish Onto Her Car

A woman in Ohio is telling a fish story about one that got away - from a bird, and damaged her car. Authorities in northwest Ohio say the fish - a Lake Erie freshwater drum, known as a sheepshead - smashed a car windshield Tuesday when an eagle dropped its catch from a height of about 40 feet.

Leighann Niles says the impact felt like a brick hitting her Toyota's windshield. The woman from the Cleveland suburb of South Euclid was vacationing along the lake in Marblehead.

Niles says she had thought herself lucky to escape damage in another animal encounter shortly before the fishy one. She says a truck hit a small bird, which struck her back passenger door and startled her 5-year-old daughter.

Information from: Sandusky Register

Evolutionary Biology: Cichlids, Gene Networks, and Teeth

In the journal *PLOS Biology*, NIDCR grantees report they have deduced a network of dental genes in fishes called cichlids that likely were involved in building the first tooth half a billion years ago. The researchers say their finding introduces into the scientific literature a core evolutionary list of molecular pieces needed to make a tooth. These original parts were then gradually rewired, replaced, or left in place to produce the various shapes and sizes of teeth now found in nature, from shark to mouse to monkey to human. The *Inside Scoop* spoke with Todd Streebman, Ph.D., a scientist at Georgia Tech University in Atlanta and a senior

author on the study, to learn more about his group's discovery.

First things first, what's a cichlid?

Cichlids belong to a large family of fish called *Cichlidae*. No one knows how many species of cichlids exist in nature. Our best estimate is somewhere between 1,300 and 3,000 species. Cichlids can be as small as 2.5 centimeters in length and as long as nearly a meter. Several species are actually quite well known. Tilapia, for example, is a cichlid species that people like to eat. And people with aquaria at home certainly are familiar with the angelfish, discus, and oscar. They're cichlids, too.

But you've focused your attention on cichlids in East Africa's Lake Malawi. Why?

Well, Malawi cichlids offer an unprecedented opportunity to study the evolution of a number of traits from color patterns and brain structure to the shaping of teeth, jaws, and other craniofacial structures. The lake is largely a closed ecosystem, and the various species have rapidly adapted to fill their ecological niches. It's estimated that about 1,000 different cichlid species live in Lake Malawi. So, from a scientist's perspective, it's almost like being a kid in a candy shop, if you like candy. The biological diversity is amazing.

You mentioned that cichlids have evolved rapidly. How rapidly?

Let me give you a little background. The ancestors of most East African cichlids probably originated in Lake Tanganyika, the eldest of the lakes in the region's so-called rift valley. Lake Tanganyika is between eight and 10 million years old, and it served as an evolutionary reservoir for Lake Malawi and the other nearby lakes and rivers. So, our best estimate is cichlids have inhabited Lake Malawi from between one to two million years. And much of the present-day diversity is thought to have evolved in the last ten- 100 thousand years.

And they are early vertebrates?

That's right. You raise an important point. A lot of really great research has been conducted in mice over the years to tease out the genetics of making a tooth. But mice are mammals that sit higher up on the evolutionary ladder than cichlids. If you study mammals only, you'll miss things that happened early in the evolutionary process. It's like walking into a theater halfway through the movie. Cichlids, zebrafish, and other lower vertebrates allow you to see the opening scenes.

Your *PLoS Biology* paper builds on a finding that you published last year. So, let's start there.

Last year, we described a genetic network that seems to control tooth size, number, and spacing in the oral jaws of three closely related Malawi cichlids. The network involved 10 genes – *bmp2*, *bmp4*, *eda*, *edar*, *fgf8*, *pax9*, *pitx2*, *runx2*, *shh*, and *wnt7b*.

These genes sound familiar.

The genes already have been reported in the scientific literature as playing a role primarily in mammalian tooth development and in other structures, such as hairs and feathers. So, we didn't discover them. I also should add that we use the term "network" to mean genes that coordinate their expression during a window of developmental time. We don't use the word in the systems biology sense of an interconnected network. Clearly, there's still a great deal of biology to work out. What's important about our discovery is the timing of differences in gene expression. We show that variation in the network kicks into gear very early in the developmental process, when the initial tooth pattern is laid down.

Teeth are evolutionarily old structures, correct?"

Exactly. Teeth are ancient. While we often think of teeth as being inextricably linked with jaws, they evolved first in the pharynx of jawless fish about half a billion years ago. As strange as this might sound, teeth predate jaws. Like hair and feathers, it's possible to study fish teeth as patterned,

iterative structures that are constantly replaced throughout life. That's certainly not the case in mammals. But it holds true in cichlids. Some cichlids have a total of about 3,000 teeth. Every single tooth gets replaced every 50 to 100 days. This is accomplished via a stem cell niche associated with each functional tooth. The ability to replace teeth throughout life has been lost in mammals.

But how did teeth evolve from the pharyngeal to the oral jaws?

"We don't know the answer. But you can still see the evolutionary transition in nature. Some lower vertebrates, like the zebrafish, have teeth only in the pharynx. Mammals, such as mouse and human, have teeth only in the oral jaw. Cichlids have teeth on both the pharyngeal and oral jaws. This unique evolutionary feature allows us to ask a question that is the starting point for our current *PLoS Biology* paper. Is tooth number regulated similarly across the pharyngeal and oral jaws?

Why this question?

It was biologically intriguing. The two jaws not only are functionally distinct and evolutionarily decoupled, but the teeth on these jaws have different developmental precursors. A tooth forms from mutual signaling interactions between a cell layer called the epithelium and one called the mesenchyme. Pharyngeal teeth likely use endoderm as their epithelial layer and oral teeth use ectoderm. If tooth number was regulated, or controlled similarly among these jaws, it might suggest that teeth are made in the same way, regardless of how and where they develop.

What did you find?

To our surprise, we found that tooth number was regulated similarly in the two jaws. Oral and pharyngeal jaws shared the same constraints on tooth number.

And the next question was why? What was the factor that controlled tooth number?

What we found is a set of common genes that we argue form a dental gene network. This network is common to most dentitions. Included in the network are the genes that we described in our previous paper. That also included *eda* and *edar*, which was a surprise. These two genes are thought to be involved exclusively in making ectodermal tissues. But we found these genes expressed in the pharyngeal dentitions, which we think are derived from endoderm. So, that opens up the role of *eda* and *edar* in tissues derived from the endoderm. It also points to the idea that before jaws, hairs, scales, feathers, and other ectodermal tissues ever arose, these genes were acting in a dental network deep in the pharynx.

You've identified a conserved dental gene network. But you clearly don't have the complete network. What scientifically does the discovery allow you to explore?

Richard Feynman, the famous physicist, once said, "I can't understand it unless I can make it." I'd flip that around to answer your question. You can't make something unless you fully understand it. For instance, we described two things in this paper. One, an ancient gene network that our data indicate is active in these oldest populations of teeth. Two, and perhaps more importantly, we describe what we call the core dental network – the set of genes conserved in all teeth that we currently know about, from fish to mouse to human. So, what's potentially interesting there not only are the things that fall into the network (surprises like *eda* and *edar*), but the things that fall out. For instance, take the genes *pax9* and *fgf8*, which are necessary ingredients for mammalian dentition. These genes are either not expressed at all or only expressed in oral teeth, not pharyngeal teeth. That suggests they are not evolutionarily necessary to make a tooth.

So you start to get a developmental context for these genes?

That's right, and when they became important in dental evolution. If you wanted to make teeth from culture or in a test tube, you could ask which types

of molecules would be necessary. Even though some of these genes appear to be genetically necessary for mammalian teeth, there may be other ways written into evolutionary biology to make teeth.

There's a school of thought that to build a tooth, you can take a reductionist approach and winnow it down to the bare essentials.

Right, let's go back to *fgf8*. It's expressed in and necessary for mammalian molars. But it's not expressed in any fish tooth that anyone has ever examined, although there are other FGF family members, and perhaps other molecules that could serve the role of an FGF if one were trying to make a tooth. Our analysis can start to point to some of those things.

What contribution can model organisms make in learning to make human teeth?

I think this is one of the open questions for the next decade of research. What are these models really for? What I see happening – for teeth and really any human organ or disease – is the genomic resources now are so good for humans, we might not need model organisms for particular diseases in the future. It's actually just as easy to go to human populations and directly ask which genes are responsible for this and that trait. But if you follow how genomic information is now being used to find human disease genes, we still need models that allow you to assemble the map between genotype and phenotype. Many of our current models, including mouse, zebrafish, and fruit fly, represent homogenous, inbred lines. In other words, they have been bred this way to make the genetics easier. Humans have heterogeneous genomes, and that's why identifying a specific genetic cause of a disease has turned out to be difficult. We see our cichlid fish and some other emerging evolutionary models as being appropriate to cobble together a better picture of genotype and phenotype. These models exhibit heterogeneous genomes like humans and the genotype-phenotype map is likely to be more complex.

The second thing, as we mentioned a moment ago, people would like to biologically engineer teeth and

make today's ceramic restoratives obsolete one day. To facilitate this, we want to understand the natural regenerative capabilities of dentitions. This then becomes very interesting. The primary model used to study the human dentition is the mouse, and the mouse does not replace its dentition at all.

But mice have incisors that constantly grow. That's why they're always gnawing on things.

True. Mice have a labial stem cell niche associated with their incisors. But their incisors are not replaced (except in a few genetic mutants). They are renewed via continuous growth. Mouse incisors also tend not to take on complex shapes. A gap in space and a gap in development exist in the mouse between the incisors and the molars. Molars take on complex shape, but are not renewed and are not replaced. In the fish that we study, we see all of those things actually occurring in the same teeth. So, what you see are teeth in any single position in the mouth that are replaced, renewed, and can take on complex three-dimensional shapes during development.

The biology is all there?

The biology is all there in the same tooth position. We think this is really the ancestral situation. Repair, replacement, and shape are coupled developmentally and genetically in an organism like our cichlids. But then throughout the evolution of vertebrates, these processes have become decoupled in time and space. What you see now in a mouse model, for instance, is that the molars are shaped but not repaired. The incisors are repaired but not shaped.

It's interesting that you've merged scientific disciplines to answer your research questions. Is this meeting of the disciplines the way to move beyond sequence and into real-life biology?

I think so. It takes a meeting of the scientific disciplines. Gareth Fraser, the lead author on the *PLoS Biology* paper, has an earlier degree in paleontology. He's an evolutionary developmental biologist, but his background is in paleo. Darrin

Don Conkel - Author and Owner of Don Conkel's
Tropicals in Florida

Admission to the workshop and auction is \$5 per person per day, or \$10 for the entire weekend. Everyone is welcome - you do not have to be a TCA member to attend.

Show tanks will be set up Friday afternoon. Everyone is encouraged to assist with this undertaking. There will also be an informal "Meet and Greet" session with the speakers on Friday evening beginning at around 6:00. Refreshments will be provided.

Show entries are \$3.00 each and **must be pre-registered by 10/20/09 - NO EXCEPTIONS.** Contact Show Chairmen Marvin England or Page Ullman with your show entries.

NOTE: No rental tanks will be available for individuals to use to sell fish during the workshop.

Holding tanks will be available for individuals bringing fish in on Friday or Saturday to sell in the auction. Out-of-town members will be given priority on these holding tanks. Call Alan Young on or before 10/20/09 to determine holding tank availability.

Speakers will make their presentations on Saturday and show winners will be announced Saturday evening. **THERE WILL BE NO AWARDS BANQUET SATURDAY NIGHT.**

A "live" auction and a silent auction will be held on Sunday. Items being sold in the live auction include cichlids, livebearers, catfish and plecos, plus honeycomb rock, filters and fish food. Seller split is 75% to Seller for items selling for less than \$30 and 80% for items selling for over \$30. All plants will be sold in the silent auction. **Please bag and mark your plants for the silent auction as you would bag and mark your fish for the live auction.** Items

received as club donations will also be sold in the silent auction. Products from several vendors, including fish food, tanks, pumps and filters, will be raffled and sold to attendees. TCA appreciates the folks who support us and we want to introduce our members to their top-quality fishkeeping products.

For further information visit the TCA website (www.texascichlid.org) or contact:

Kathy Stearns (817) 991-2199
Alan Young (817) 683-7659 or
alanyoungdrfish@hotmail.com
Page Ullman (817) 831-7876
Marvin England (903) 244-3993 or
marvinengland@hotmail.com

TENTATIVE SCHEDULE OF EVENTS

Friday, October 23rd:

Show Set Up	5:00
Meet & Greet the Speakers	6:00
Show tanks ready for fish	8:30

****Registration desk is not open on Friday****

Saturday, October 24th:

Registration opens	9:00
Speaker Presentation	10:00
Lunch on your own	11:30
Speaker Presentation	1:00
Speaker Presentation	3:00
Dinner on your own	4:30
Show Winner Awards Presentation	7:00

****Show fish can only be removed from their tanks after all winners are announced****

Sunday, October 25th:

Registration opens	9:30
Auction begins	11:00

Officers and Board Members will be elected at the January meeting. We need enthusiastic, creative-thinking folks to run for these offices. If you fit the bill, please run. TCA needs your efforts to keep up the good work!

TAIL TRADER

Got something fishy to sell or trade? All TCA members in good standing may advertise fish, equipment and related supplies for sale, or place a "want" ad free. Notify the Cichlid Tails editors.

David Andrews
3828 Wayland Drive
Fort Worth, TX 76133
(817) 291-4169
dandrews12@att.net

FOR SALE:

Albino Dwarf Bristlenose Plecos \$3.00 each
Dwarf Bristlenose Plecos - Brown \$2.00 each
Neolamprologus Leleupi (Orange) - 1 1/2" \$3.00each
Endlers Livebearers \$0.50 each
Pseudotropheus Flavus - 1 1/4" - 1 1/2" \$1.00 each
Pseudotropheus Polit - 1 1/4" - 1 1/2" \$2.00 each
Albino Auratus - 1 1/2" - 1 3/4" \$2.00 each
Pundamilia nyererei - 1 1/4" - 1 1/2" \$2.00 each
Telmatochromis Brichardi F1 1 1/4" - 1 1/2" \$2.00 each
Cyphotilapia Frontosa Mpimbwe - 1 3/4" -2" \$12.00 each

Randy Rhoades
(817) 426-0901
fish_man_randy@yahoo.com

FOR SALE:

Four 60-gal. tanks . . \$100 each
Two 75-gal. tanks . . \$100 each
Two 58-gal. tanks . . \$80 each
OR ALL FOR \$700
All on double stack stands.
Air pump to blow all tanks . . \$50
240-gal. full setup with everything, including 2 wet-dry filters . . \$1,000

Diane Stewart
1025 Granite Street
Desoto, Texas
(972) 223-3735
Diane.Stewart@eurocopterusa.com

FOR SALE:

One 30 gallon wet-dry filter & pump consisting of:
Little Giant Model 2-MD-SC 1/20 HP water pump
30 gallon sump tank drilled
All fittings including overflow box, pvc, etc..
5 gallon bucket of bio-balls
Extra blue filter padding
\$75 for all of the above
Two Rubbermaid Roughneck 30 gallon rectangular with lids - \$5 each

Calendar of Events

September 11-13, 2009: Annual FOTAS convention hosted by Houston Aquarium Society. Registration is available on-line. For more details visit the HAS website: www.houstonaquariumsociety.com.

October 10-11, 2009: Oklahoma Aquarium Association will host the OKAA Fall Classic. For more details, visit the OKAA website: www.okcaa.org

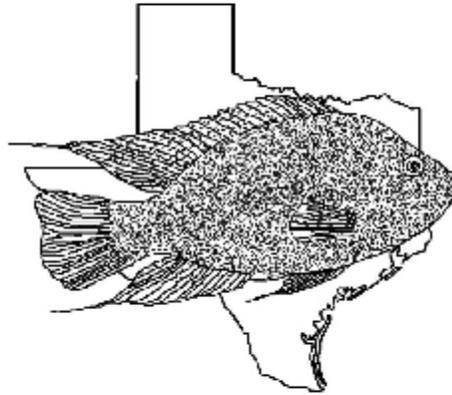
October 23-25, 2009: TCA Fall Show, Workshop & Auction, Hilton Garden Inn DFW South, 2001 Valley View Lane, Irving, Texas, (972) 313-2800. Special room rate of \$75 per night. Speakers include John Hansen, Mike Wise and Don Conkel. Meet & Greet the Speakers on Friday evening, with refreshments. Speaker presentations Saturday with show award winners being announced at 7:00 Saturday evening. Live and silent auctions Sunday. Visit TCA website for more information.

December 12, 2009: Annual Christmas Party and Crazy Santa Gift Exchange, 7:00 at Spring Creek Barbeque, 1509 Airport Freeway, in Bedford.

January 16, 2010: Regular monthly meeting at 7:00 at Spring Creek Barbeque, 1509 Airport Freeway, in Bedford. Officers and Board members will be elected.

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OFFICIAL NEWSLETTER OF



THE TEXAS CICHLID ASSOCIATION

Texas Cichlid Association
Kathy Stearns, President
1515 Creekview Drive
Keller, Texas 76248