FISH IN FOCUS: TAMAZULA REDTAIL SPLITFIN XENOTOCA LYONSI



Naperville, Illinois

What's in a name? Lots, really. Names are useful identifiers for people, places, animals, and things, but they are so much more useful than distinguishing "This from That." In human societies, our names, especially our last names, can provide historical information about occupation (Smith, Farmer), lineage (Anderson, D'Alessandro), place of origin (Soriano, Calabrese), and even physical attributes (Little, Armstrong).

In animal species, there is a common name and a scientific name. While common names can be hundreds or thousands of years old and in a multitude of languages, the starting point of scientific names is 1737. That was the year that Carl Linnaeus (1707–1778) published the first edition of *Systema Naturae*, which established the system of binomial nomenclature for species.¹ Domestic dogs became *Canis familiaris*, domestic cats became *Felis catus*, and humans were dubbed *Homo sapiens*. Giving humans a biological name like other animals created some controversy at the time. *Systema Naturae* was published more than 120 years before Darwin's *The Origin of Species*, which first challenged the idea that human beings were separate and apart from every other living organism on Earth.

The Linnaean system relied on physical attributes to describe species. As more scientists began studying and exploring the world around them, the species and genera they identified were sometimes named in their honor, like *Xiphophorus couchianus*, named for American naturalist Darius N. Couch,² and *Girardinus*

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Litzi Hartley's experience with keeping livebearers began in 2010, when her then-ten-year-old daughter Larissa requested and received an aquarium for Christmas. It was a 15-gallon stocked with four pet store mollies. After a week or so, Larissa lost interest. The tank became Litzi's. The mollies' population grew. With the exception of a nearby Petco that has since closed, Litzi found that large chain pet stores didn't accept donated fish. She found the Chicago Livebearer Society and soon began donating fish for their swap meet sales. Litzi's interest in fishes grew. She now has 21 tanks, including a 75-gallon and two 55-gallons. In addition to domestic swordtails, guppies and mollies, Litzi has established breeding populations of Xenotoca lyonsi, Xenotoca variata and Xiphophorus couchianus. She continues to regularly donate fish for table sales and rare fish auctions. She also shares fish with other hobbyists through social media contacts. When not caring for fish, Litzi is a therapist with a group psychiatric practice. She lives in Naperville, IL, with her husband and children.

metallicus, named for French zoologist Charles Frédéric Girard.³

That brings us to genus Xenotoca and Xenotoca lyonsi, the subject of this article. According to www.fishbase.se, Xenotoca lyonsi was named after Dr. John Lyons (University of Wisconsin), "who has made substantial contributions to the understanding of the distribution, ecology, diversity, and conservation status of fishes in Mexico, and to goodeids in particular."4 I am proud to call John a friend. According to www.fishbase.in, there are five species listed in the genus Xenotoca: doadrioi, eiseni, lyonsi, melanosoma, and variata.⁵ But Xenotoca lyonsi wasn't always Xenotoca lyonsi. According to the Goodeid Working Group, the first specimens were identified and collected by Swedish scientist Gustav Eisen in 1894, and they were originally named Characodon eiseni. In 1896 they were then named Xenotoca eiseni.^{6,7} The genus Xenotoca naturally occurs in waterways and basins throughout the northern and southern Mexican Central Plateaus, which together form an immense area from the states of Chihuahua, Coahuila, Durango, Zacatecas, and San Luis Potosí in the north to Aguascalientes, Jalisco. Zacatecas, Querétaro, and Michoacán in the south.8

As I mentioned earlier, the Linnaean system and scientists from the eighteenth century onward relied heavily on physical characteristics for identification. It wasn't until November 2016 that the species of *lyonsi* and *doadrioi* were identified and recognized as species separate from *Xenotoca eiseni*.⁹ Anyone who has kept *Xenotoca eiseni*, *doadrioi* and/or *lyonsi* can tell you that these species can be very difficult to tell apart visually. Aquarists often look for very subtle and slight differences in color patterns. Here is the Goodeid Working Group's description and a photo of an adult male *Xenotoca lyonsi* (Figure 1):

Males show a colouration that varies depending on the size and reproductive stage, but in general the posterior half of the caudal peduncle has an orange colouration that extends to the caudal fin, and sometimes some iridescent blue scales are present. The anterior half of the caudal peduncle sometimes possesses blue iridescent scales that frequently extend anterior to the anal fin in the ventral region and to the middle of the dorsal fin, the intensity and coverage of each colour is highly variable. Anal, pectoral and dorsal fins can show some pigmentation, being orange to dark colouration. The anteroventral portion of the body is normally with a brown to white colouration, the dorsal region is brownish in colouration, with blue iridescent scales in some males. Sometimes the dark blotch just up to the pectoral fin is present,



Figure 1. Male *Xenotoca lyonsi*. (Photo from Goodeid Working Group website. © Leo van der Meer. Used with permission.)

and also is highly variable in intensity and size, and is less evident than in *"Xenotoca" doadrioi*.¹⁰

Compare this to the Goodeid Working Group's description and a photo of an adult male *Xenotoca eiseni* (Figure 2):

In males, the posterior half of the caudal peduncle is orange to red-orange. This bright colour continues well onto the membranes of the caudal fin or at least persists as a pale yellow-orange zone at the fin-base. The anal fin is similarly coloured except for the shortened anterior six rays which remain clear. The dorsal may be dusky to dark in some populations and pale yellow-orange in others. In large males a narrow median dark stripe runs through the dorsal fin. Paired fins are pale yellow (large mature males) or clear (immatures). A bluish-black band, equal to or slightly larger than an eye diameter, extends from the upper edge of the opercle posteriorly along the midside, becoming indistinct near the midlength of the pectoral fin. A similar dark band, beginning below the midlength of the dorsal fin and running back onto the caudal peduncle, occurs in males 40mm SL or larger. The top of the head, nape and back are olive-brown to dusky; these colours grade into lighter shades ventrally. The sides of the posterior third of the body and anterior half of the caudal peduncle range in colour from dull blue-black to iridescent turquoise. The chin, throat and belly are pale yellow to off-white.¹¹

Given their similarities, it's quite remarkable that these fishes are separate species, considering the variability in sizes, shapes and colors of *Homo sapiens* and the fact that both Teacup Poodles and Great Danes are both considered *Canis familiaris*. So, what does all this taxonomical history have to do with the modern keeping of *Xenotoca lyonsi?* Plenty. With too many fish species, captive maintenance and breeding is the last defense against complete extinction. Therefore, maintaining the genetic integrity of threatened, endangered, and extinct-in-the-wild species is critically important. As Andy Piorkowski noted in his livebearer profile of *Xenotoca doadrioi*:

As a result of the re-description of the *eiseni*-complex, there is a high probability that when looking for this fish you may encounter misidentified species or hybrids. Fish listed for sale as "eiseni" may be any of the



Figure 2. Male *Xenotoca eiseni*. (Photo from Goodeid Working Group website. © Wolfgang Gessl, www.pisces.at. Used with permission.)

3 species or a hybrid depending on the integrity of the captive line and the knowledge of the previous keeper. Special care is recommended to obtain fish from a known location and for that to be communicated forward when sharing fish with other keepers. When I received my fish, they were referred to as "Eiseni San Marcos.¹²

This brings us to the "fun" part of the article-husbandry! I was first introduced to keeping goodeids when I received a free bag of juveniles at the 2018 American Livebearer Association (ALA) Convention in Grand Rapids. The bag indicated the fish were Xenotaenia resolanae and Xenotoca lyonsi. I put the fish in a planted 29-gallon aquarium. I use hang on back (HOB) filters for tanks under 55 gallons, and I'm a fan of the Marineland Penguin series. For tanks 55 gallons and over, I use Sunsun canisters, and I usually have a Penguin 375 running as a secondary filter. To avoid the dreaded New Tank Syndrome when ammonia and nitrate levels spike, I took an established Penguin 375 filter off my 60-gallon and put it on my 29-gallon. I got a new Penguin 375 and installed that as the new secondary filter on my 60. I got an inexpensive Aquaneat LED light from eBay. With no heater, the water temperature stayed at room temperature. I used Eco-Complete substrate for planted tanks.

I had some struggles with keeping plants going in the cooler water. Giant Hairgrass and *Vallisneria* did very poorly, and even Amazon Swords struggled. The only plants that did well were *Cryptocorynes* and Hornwort. I bought a stronger LED light, which the algae loved, but it didn't do much for the plants. Meanwhile, the fish did very well. The seven juveniles grew and started having babies of their own. The tank was starting to get crowded. So, I cleared out a vintage 30-gallon hexagon tank and I aquascaped it with tall, wispy *Cryptocorynes*, Amazon Swords, and Hornwort and a slate and carved lava rock decoration (Figure 3).

I noticed the *X. resolanae* and larger *X. lyonsi* were bullying the smaller *lyonsi*, especially the smaller males, so I wanted to pull them out and give them a tank of their own. I wanted the hex to be strictly *lyonsi*, so I sent photos to Michael Köck to help me tell them apart. I got a Penguin 275, but I swapped out some parts and filter media from a 375 to prevent New Tank Syndrome. For some odd reason plants did much better in the 30-hexagon than the 29, but the fish in both tanks did very well.







Figure 4. Alpha colony in 29-gallon aquarium.

I noticed the *Xenotaenia resolanae* consistently bullied the *ly*onsi, so I sold them to an aquarist in Georgia. I now had two single species tanks of *Xenotoca lyonsi*.

For food, all of my fish get a blend of color blend, freshwater, spirulina, brine shrimp and earthworm flakes from www. almostnaturalfishfood.us. My larger colorful fish like my *lyonsi*, *Xenotoca variata*, swordtails, and glo-fish tetras also get Tetra color enhancing tropical granules.

The 29-gallon is my alpha colony (Figure 4). When they have fry, I will move those fry into the 30-hex. When the fish in the 30-hex get big, especially the males, I move them to the 29. I also try to keep a higher female to male ratio in the 29, at



Figure 5. Top: Male lyonsi; Bottom: Female lyonsi.

least 3:2 females to males, 2:1 if possible. Then every couple of months or so, there will be a swap meet or someone will contact me looking for *lyonsi*, and I will sell or trade. My *lyonsi* tanks pretty consistently produce 10–20 young or more every couple of months. I have found that my arrangement promotes consistent and vigorous breeding, minimizes bullying, and allows fry, juveniles, and young adults to thrive and become robust adults (Figure 5).

In August 2020 I had an aquarist from western Missouri contact me looking for lyonsi. I told him I had shipped fish many times before all over the country using USPS Priority Mail with great results. He told me that with the postal service cutbacks his mail service was hit or miss, and he asked me to please send some extras. So, I bagged up 24 juvenile Xenotoca lyonsi in breather bags, double bagged them in Ziplock bags, and boxed them up in a styrofoam mailer. I mailed them on August 11. Days went by: no fish. Tracking showed the package was scanned at my local post office, then nothing. The intended recipient went to his local postmaster who told him it appeared the package never left my local post office in Naperville IL. I went to my local post office, explained the situation, and begged them to please search the facility for the missing shipment. They assured me that every single piece of mail leaves their facility by the end of each day.

So, after being missing for 15 days, I filed a lost package claim with the USPS, which was promptly paid. I prayed that the package had been stolen and my fish were happy and safe in an aquarium somewhere and not dead in a dumpster. In early September 2020, I had more *Xenotoca lyonsi*. So, I sent my friend in Missouri 16 *lyonsi* along with about 30 cobra guppy

fry, but this time they were going Fedex Overnight at five times the cost of USPS Priority Mail. The fish arrived the next day safe and sound. Then, on September 12, I got a series of short video clips from my friend in Missouri. The missing fish had arrived. Expecting to find dead, rotting fish, he opened the box carefully while wearing gloves and near a dumpster. To his surprise, 22 of the 24 lyonsi and the guppy fry were alive and well! They were active, swimming, and the water in the bags wasn't even cloudy. After being acclimated, the 22 long lost lyonsi joined their 16 brothers and sisters in their new Missouri home.

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