



In Seine Menu

*Champaign Area Fish Exchange, Inc.
Members Educational News Update*

June 2008



Champaign Area Fish Exchange

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MONTHLY MEETING: Saturday, June 7, 2008. Picnic at the home of Carol and Bruce Chassy, 1210 Dorchester Dr., Champaign, IL. 5:00 p.m. See the map at the end of this newsletter.

PROGRAM: Cookout and picnic. We will cook a turkey on the grill rotisserie. A second grill will be available for other items. Also bring a dish to pass. The club will provide beverages and table service.

COVER PHOTO: Young Bettas. Photo by Phil Nixon

CAFE Website: www.champaignfish.com

To submit articles and classified ads to the newsletter, email Carie Nixon at dragonfly@illicom.net
or mail to Carie Nixon, 381 County Rd 1300 E, Tolono, IL 61880
You may also bring material for the newsletter to the monthly meeting.

Calendar of Events

- June 7 CAFE picnic, 5:00 pm, Champaign, Illinois.
- Aug 19 Missouri Aquarium Society, Summer Auction at the Stratford Inn, 800 S. Highway Dr., Fenton, MO Viewing at 11:00 AM, Auction at NOON For more info contact John 618-604-7228 or Johnsfishy@att.net or visit the Website at www.missouriaquarium-society.org
- July 12 **CAFE Summer Auction**, Urbana Civic Center, Urbana, IL
- Aug 6-9 **The International Symposium On Freshwater Stingray Biology** Holiday Inn Express, Palatine, Illinois. stingraysymposium.com
- Aug 19 **Missouri Aquarium Society, Summer Auction** at the Stratford Inn, 800 S. Highway Dr., Fenton, MO. Viewing at 11:00 AM, Auction at NOON. For more info contact John 618-604-7228 or Johnsfishy@att.net or visit the Website at: www.missouriaquariumsociety.org
- Sep 2 **Circle City Aquarium Club Fall Auction** at Holiday Inn, Beech Grove, IN for more info contact Bill Flowers at ccacauction@gmail.com
- Nov 18 **Missouri Aquarium Society Fall Auction** at the Stratford Inn, 800 S. Highway Dr., Fenton, MO. Viewing at 11:00 AM, Auction at NOON. For more info contact John 618-604-7228 or Johnsfishy@att.net or visit the Website at: www.missouriaquariumsociety.org

Classified Ads

(free to CAFE members)

Fish For Sale:

Excellent tank cleaners: young bristlenose catfish (*Ancistrus* sp.) for sale. F1 generation from wild caught parents. \$4 each or 3 for \$10. Call Carol at 217-356-7331 or email: mr.fang@in-sightbb.com



Catfish: Understanding These Scavengers

by Dave Ball

President of the Southern Colorado Aquarium Society
Aquarticles

When an aquarist makes the decision to introduce catfish into the community aquarium or to set-up an aquarium dedicated to a group of catfish, understanding the needs of these fish is a must. Catfish are a large group of fishes that are regarded by most as a single order called Siluriformes (sometimes called Nematognathi). Others place them as a suborder, Siluroidei, of the order Cypriniformes. However, in most classifications after 1966, the catfishes are considered an order, the Siluriformes, consisting of 32 families. There are 2,200 plus species that fall under 400 genera of catfish, most of which (some 1,300) inhabit the fresh waters of the New World. The remaining species are scattered around the world with the greatest number occurring in Africa and Asia. Temperature is the main reason that distribution is limited, few or no species seem to be found in the extreme southern regions of South America nor in the northern areas of Eurasia and North America. There are 2 families that inhabit brackish and marine environments. They are the Plotosidae (Coral and Tandan Catfish) and the Ariidae (Sea Catfish). South America has some of the most primitive catfish found in the world today, making some of them the most unusual in the world.

Siluriformes have developed many different ways for each to adapt to its own environment. The most important is the intake of available oxygen. The types of habitats that catfish live in range from the still waters of lakes and ponds to the cool rapids of mountain streams. Many require highly oxygenated water that is both clean and clear. Cool water maintains a higher level of oxygen than the stagnant, silt-filled water of the jungle ponds and swamps. Adaptations in this area are as diverse as the animals that developed them through time. In the hill-streams of Asia and Africa the fish have a highly modified mouth for holding on to rocks and have modified gills to take in oxygen. This is done by suspending breathing for a moment to allow a suction to form, then the intake is totally controlled by the modified gills pumped solely by the movement of the operculum. Some animals have taken this method a couple of

steps further by having a streamlined body and pectoral 'spines' that assist in regulating the flow of water past the operculum. Catfish do not have spines in the true sense that other fish have. They are really a 'spinous ray', found in the pectoral, dorsal and sometimes the adipose fins. The spinous rays found in the pectoral fins are unique in these animals because of the fact that they are quite strong and often serrated on both sides. This makes them an excellent defense weapon.

Other modifications for breathing include the use of the intestines by taking in air at the surface (Loricariids and Callichthyids), swallowing it and absorbing it with the thin walls in the digestive tract. The remainder is passed on through the vent. Species found in the genus *Clarias* have a labyrinth device. Several other genera have multiple uses for the swim bladder, one of which is for respiration. The Heteropneustidae (Fossil Cats), have airsacs that run nearly the entire length of their bodies which are connected at the second and third gill arches by way of modified gill filaments and organs. These airsacs resemble lungs in regards to function and appearance.

Many catfish have been placed in the unusual and even the oddball category in the aquarium scene, and for good reason. They have adapted themselves to their own environments very well by making multiple use of some of their features. The spinous rays are just one of those items that have more than one use. Their strength and toothed edges on the pectoral fins, used with the one in the dorsal fin, make for a great defense mechanism against animals and humans alike. These make the fish a nasty mouthful. Nile River crocodiles have been found on the banks of the river dead with

catfish lodged in their throats. Most of the time they are used as a stinger in a defensive or passive use. Several of these animals take this defense a step further by adding poison. The poison gland is normally located at the base of the pectoral fin and secreted through the spine or its edges. Most noted is the previously mentioned "Fossil Cat". This catfish is not found in stores very often and must be handled properly. They are very aggressive and will not hesitate to use their weapons. The sting from this animal will cause major swelling and illness to the handler. Most stings from the other poisonous catfish deliver the same effect but are rarely fatal. Some other fish have spines along the lateral scutes and these are combined with thick skin and armored plates, making them very tough customers to eat.

The swim bladder is another organ that has multiple uses in catfish. As was previously mentioned respiration is just one use. One other use is to amplify the sound that is created when the dorsal and pectoral spinous rays are moved in their sockets. The muscles and filaments connected to these spinous rays and sockets are linked to the rear skull and vertebrae in the spine in other catfish. These are also attached to the outer walls of the swim bladder and act like springs. When contacted they cause the walls of the swim bladder to vibrate and create a squeaking or croaking noise. This sensation can be felt with the cooperation of the catfish, of course, by touching the fish on the soft part of the belly between the pectoral spines. Doradidae (the Talking Catfishes) and *Synodontis* (the Upside-down Catfishes) are the two most well known users of this defense mechanism. Catfish use their swim bladder the same way that other fish use theirs, but catfish have yet another use for theirs. Its called the

“Weberian Apparatus”. This is a very complex series of bones, muscles, and ligaments that connect the inner ear to the swim bladder. What happens here is that the swim bladder is used to amplify sound that the fish receives instead of being used to produce sound. Sound is picked-up through the inner ear, then is passed on along a set of paired bones that are connected by ligaments to the rear base of the skull and the modified fourth vertebrae. These bones make contact with the swim bladder. The sound is then amplified by either direct or indirect method of attachment to the swim bladder. This is a very effective way to detect many types of threats the animals might face in the wild, and also makes them very hard to sneak up on in the home aquarium.

The methods of feeding used by the Siluriformes are as varied as the diets themselves. They range from algae and invertebrates to live fish. Some catfish are active nocturnal predators, others search for snails and freshwater shrimp, and some scrape rock and wood for algae. Invertebrates seem to be the one food that all catfish take in at least some time in their lives. The family known as Trichomycteridae (the Parasitic Catfish), are often found feeding on the gill tissue and blood of other fishes. Another very unusual method of feeding is that of the Indian species of the Schilbeidae family, where scales of other fish are the main staple in their diet. Catfish rarely use their eyes to find food, instead food is detected by taste. Keep this in mind when maintaining these animals. If it tastes good and the catfish can get its mouth around it, consider it eaten. Catfish are high on the list of opportunistic feeders. Many aquarists have lost their schools of small tetras while their catfish stay fat and healthy.

Swimming techniques are also varied, those that are good mid-water swimmers prefer to be kept in groups and get very nervous if they aren't. They are the Schilbeidae (Glass and Pangasius Catfish), the Siluridae (Sheat Catfish), the Plotosidae (Coral Cats) and some species of Mochokidae (Upside-down Catfish). Other catfish that like to swim in groups live on or near the substrate, however, that would require writing a list based on separate species and the list would be a long one. Many of the larger catfish tend to be solitary animals relying on armor or unique color patterns to give them some safety.

Understanding the differences between the families of catfish is very important. These animals are filled with sensory organs that are there to help them survive. If not taken care of properly, the animal may just be alive instead of thriving. Should proper care not be taken into consideration, the animal will probably be lost which can be quite expensive. These fish may be at the bottom of our tanks but they shouldn't be treated as the last to get the good food the other fish receive. Keep this in mind and provide hiding places, proper water quality, and they will repay you with many hours of enjoyment.

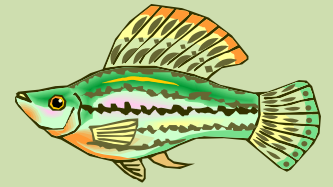
Bibliography:

- Burgess, Dr. Warren E., 1989. An Atlas of Freshwater and Marine Catfishes, A Preliminary Survey of the Siluriformes. T.F.H. Publications, Inc., New Jersey.
- Sands, David, 1986. A Fishkeepers Guide to African and Asian Catfishes. Salamander Books, Ltd., London, England.
- Petrovicky, Ivan, 1988. Aquarium Fishes of the World, The Hamlyn Publishing Group Limited, London.

Taxonomy: Scientific Classification

by Robert Fenner

Reprinted with permission from Bob's website in San Diego, www.wetwebmedia.com
Aquarticles



Wait! Don't touch that dial! I know what you're thinking. Another wanna be pet-fish ichthyologist taking up precious paper space to try his hand at the world's most boring subject? Nay, nay nay! I promise, this section, will not be only practical and informative, but chock-full (yes, that's how it's spelled) with entertainment value.

Let's take this subject, taxonomy. What!? Another tax? No; you remember, classification. Kingdoms, Orders, Families, Species, blah, blah, blah. What's it to you? Well, if you stick with me, I'll show you how taxonomy will help you thrill, amaze and impress your friends, and (gasp!) make money.

The principal purpose of classification is to take a whole bunch of data: facts, ideas, methods and attitudes, that might seem almost totally unrelated and put them together in a system to make them more useful/useable. How's this work with your livestock? Example: You might know that the percula clownfish (*Amphiprion ocellaris* et al.) are sensitive to metal medications and contamination. Knowing that maroons (*Premnas biaculeatus*) are also members of the same sub-family, Amphiprionae might/would/should lead you have a notion that these species might share similar tolerances, foods, diseases... & so they do! As a matter of fact, should you be so inclined to delve into the literature you'd definitely be impressed with this sub grouping of the damsels. There are about two genera with about twenty nine described species so far. They're all obligate sybionts with certain species of anemones; synchronous hermaphrodites with males becoming larger females with age and need... susceptible to *Glugea* infections...

Now, isn't easier to just remember that percs and sebaes, maroons, tomato clowns, and other related species share family habits and conditions than committing so much ROM (read-only-memory) in your brain for each species separately? Of course! In fact, the related families

of fishes in the same Order, the Perciformes (= perch-like fishes), with such notable aquarium species as marine angels and butterflyfishes (Chaetodontidae), the basses (Serranidae), hawkfishes (Cirrhitidae), and many more all have structural and useful life-history characteristics in common. And you wondered how anyone could possibly remember so much of this stuff!

And the brain-space savings don't stop here. The "higher taxonomy of fishes involves groups greater than the family level. You will be amazed. For now, let's get on with a discussion of taxonomy itself. I'll give you a brief historical approach, putting in concepts not generally covered in pet-fish periodicals. Keep in mind the utility of this tool, and enjoy!

Taxonomy or systematics is the science of classifications. There are two divisions: Numerical, which reorders groups along arbitrary lines; such as the Dewey Decimal System; and Biological, which deals with the classification of whole organisms.

It seems that all forms of life on this planet evolved from one, or at most, several common progenitors about three billion years ago. It is, therefore, easy to see why every living thing bears so much in common. According to how much life forms have in common taxonomists place them into more and more definitive groups, e.g. family, genus, species... The study and representation of these relationships is termed phylogeny (Latin for "branch origin") a/the story of life's evolutionary "coming down"...with time organisms radiate in form and function to fill and empty certain ecological niches.

Who's on First?:

Archelaus of Miletus in the sixth century B.C. gets credit by some for coming up with fundamental concepts like species and the sense of need for using one "good" name for each type. But it's Aristotle (384-322 B.C.) with his cadre of graduate students, who generally grabs the credit for the rudiments of scientific classification. Aristotle was aware of the differences between fishes and aquatic mammals (e.g. Cetaceans like dolphins & whales). Many people who followed did not know this. He accurately described some 118 species of fishes from the Aegean Sea, but had little idea of the mutability of local names, or evolution.

A few others, who came later in the "ancient" world made further recordings of what they recounted as types of organisms. Pliny, Aelianus, Aethiopicus... In the sixteenth and seventeenth centuries Belon (1518-64, Rondelet (1507-57, Salviani (1513-72) and Ray and Willoughby (publ. 1686) were noted chroniclers of fish-naming.

The real "birth" of modern taxonomy has its point of origin the tenth edition of *Systema Naturae*, (1758) by Carolus Linnaeus (Karl von Linne), the "father" of modern taxonomy. Linnaeus gets the big credit for innovations like the "two-word naming" (binomial nomenclature) of species and arrangement of categories like classes, orders, and families (taxa, singular taxon).

What this all means is that, when you're out and about, collecting fishes and trying to determine whether you've got a new species or not, you've got to go back all the way to the year 1758 and search the pertinent literature

to determine whether or not you've found something new. Similarly, around the world, folks who study structure, biochemistry, genetics, behavior et al. are trying to make sense of higher/greater similarities of these organisms and grouping these assemblages into larger and smaller genera, families, orders... You start to see that this is a very human, read that artificial enterprise. One subject to change with new and better data.

The fishes themselves don't arrange themselves in the "families" we put them into; and the folks in Natural History Museums, Zoos, Aquaria, learning institutions and private investigators who do the studies and the lumping/splitting are mere mortals like us. These classifications are mere useful fabrications for ranking and ordering related information. With perhaps as many as forty thousand valid species to be counted, scientific classification goes a long way to, on the one hand, work-out

the phylogenetic relationships of organisms and their implications, and on the other hand, keep track of all the disparate information about our fishes. For real spiffy specifics on the minutiae of naming check out Leibel and Ford's pieces cited below.

Further Reading & Where I Lifted This Stuff:

Ford, David. 1981. Understanding Basic Aquarium Science & Calculations. Freshwater & Marine Aquarium (FAMA) 4(5)

Leibel, Wayne S. 1985. Of Pickled Fish & Ichthyological Sleuthing: A Primer for the Advanced Aquarist Part 1: The Whys and Wherefores of Scientific Nomenclature. FAMA January Issue

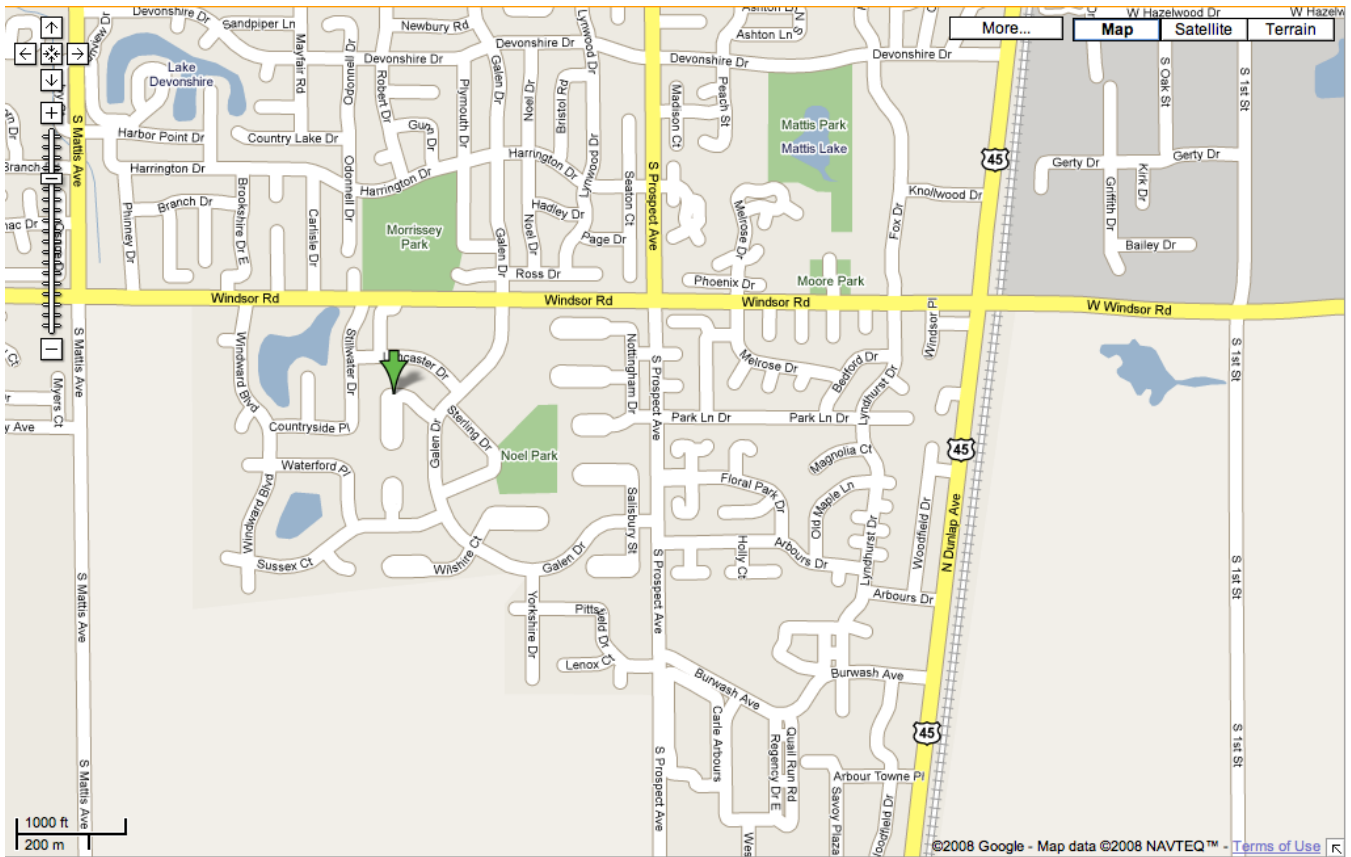
Nelson, Joseph S. 1976. Fishes of the World. John Wiley & Sons.

Sterba, Gunther. 1966. Freshwater Fishes of the World. The Pet Library Ltd. English Translation



Metallic Flagfin Shiner—photo by Phil Nixon

**Map for this month's program.
Champaign, Illinois**



1210 Dorchester Dr., Champaign. Meet here at 5:00 p.m.