

Cichlids of the Americas - Angelfish

One of the "pancake" cichlids.

By Wayne S. Leibel

I know it's sometimes hard to believe that angelfish or discus are really cichlids, let alone cichlasomines. They certainly don't look cichlasomine — and they don't act like cichlids. At least this is the case for the cultivar (man-made) varieties, which have had most of the "cichlid" bred out of them in the interests of "improving" their coloration or finnage.

I won't attempt an in-depth discussion of how to breed angels and discus here. Instead, I will refer you to a number of excellent articles and books that cover the topic well (e.g., *Angelfish*: Marks 1995,1996; *Discus*: Schulze 1988).

I would, however, like to inform you of the charm and husbandry of wild-caught angelfish and discus, which, along with the redoubtable uaru, make up an interesting assemblage of highly compressed "pancake" cichlasomines. Many of the wild forms are as pretty or prettier than their cultivated counterparts! They certainly are more the essence of cichlid and more challenging to breed!

There are currently three valid, recognized species of freshwater angelfish (*Pterophyllum*) species, including *P. altum*, *P. leopoldi* and *P. scalare*. They are readily recognizable by even the rankest of beginners because of their (erroneous) reputation as "beginner's" fish.

They are characterized by their dramatic flatness (lateral compression), their triangular shape created by the strongly elongated dorsal and anal fins, by their silvery color with contrasting black vertical bars, and by their long, modified ventral fin "feelers" (which they share with the festivum, *Mesonauta* sp.). The highly compressed body and the alternating stripes make them blend in with the vertical grasses and plants, and the submerged branches in their natural habitats. All three angelfish species exhibit, to a greater or lesser extent, these unique (among cichlids) morphological features. However, the differences among regional forms are dramatic enough for ichthyologists to have classified several of these as distinct species in their own right.

Nomenclatural History

Burgess (1979) has reviewed, in highly readable fashion, the nomenclatural history of the angelfishes, which I will summarize here. Lichtenstein (1823) described *Zeus scalaris* from a single specimen collected in Brazil. The type specimen, which was deposited in the Berlin Museum, was later examined by Cuvier and Valenciennes, who were unaware of Lichtenstein's published description. They renamed the fish *Platax scalaris*, but their description was based on that single and apparently mutilated specimen.

Heckel, in 1840, redescribed this species based on additional specimens from the Rio Negro. He erected the genus *Pterophyllum* for it and included *scalaris* in this genus. *Pterophyllum* means "winged leaf," referring to the highly compressed body and finnage, and *sculari* means "ladder" or "stepped."

Castelnau (1855) described a second species of angelfish, *dumerilii*, and, unaware of the work of Heckel, Cuvier and Valenciennes, and of Lichtenstein, erected the genus *Plataxoides* for it (the Greek root "plata" means flat). This was later corrected by Günther (1862), who actually synonymized all (incorrectly in the case of *P. dumerilii*) as *Pterophyllum scalaris*, the current name of the "common" angelfish. The "altum" angelfish was described by Pellegrin in 1903 as *Pterophyllum altum*, and a fourth species, *Pterophyllum eimekei*, was added by Ahl in 1928 — the latter based on aquarium (commercial) material. Ahl's species later proved to be identical to *P. scalare* (Schultz 1967), although the name appears in aquarium texts of the 1940s through the '60s.

Finally, J. P. Gosse described a fifth species in 1963 as *Plataxoides leopoldi*, believing that Heckel's genus name *Pterophyllum* was already being used to describe a genus of insects at the time of Heckel's description. It wasn't, and *P. leopoldi* was judged by Schultz (1967) to be a synonym of *P. dumerilii*. However, Sven Kullander (1986), re-examining the type specimens of both *P. dumerilii* and *P. leopoldi*, concluded that the holotype (single specimen used for classification) of *P. dumerilii* was actually a variant of *P. scalare*, and that *P. leopoldi* was distinct and valid.

His interpretation was based on head shape (predorsal contour): *P. dumerilii* and *P. scalare* share a "notched" profile, while *P. leopoldi* lacks the notch and has a conspicuous black spot at the dorsal end of the fourth vertical bar. It is also relatively squat and short-finned relative to *P. scalare* and *P. altum*. Kullander (1986) believes *P. leopoldi* bridges the

morphological gap between *Pterophyllum* and *Mesonauta* (*festivum*).

To make things even more confusing, Burgess (1976) had initially concluded that *P. scalare* and *P. altum* were simply clinal variants (endpoints of a morphological and geographical gradient) and therefore the same morphologically variable species (i.e., *P. scalare*). Later, Burgess (1979) suggested that these be promoted to subspecies status (i.e., *P. scalare scalare* and *P. scalare altum*). Review by Kullander (1986) of these two forms suggested to him that *P. altum* and *P. scalare* were indeed "good" species that could be separated unambiguously, particularly with respect to the vertical barred patterns of each: the bars of *P. altum* are much wider.

Cichlid hobbyists who have seen *P. altum* and *P. scalare* I'm sure will agree. However, Kullander (1986) suggests that the "scalare" he examined from Guyana, Brazil and Peru vary in fin and scale counts and coloration, and we may well see *P. scalare* split into several additional distinct species in the years to come. Indeed, wild *P. scalare* imported into the hobby from different collecting locales (e.g., Guyana, Brazil, Peru) differ in several obvious ways, including head profile, intensity of vertical barring and the presence or absence and extent of red spotting on the flanks.

So scientists and aquarists alike are currently dealing with three species: *P. scalare*, the typical silver angelfish found in the Amazon from Peru through Brazil and into the Guyanas; *P. altum*, the high-bodied Rio Orinoco and Rio Negro angelfish; and *P. leopoldi*, the "dumpy" angelfish from Guyana and the Rio Negro. It is *P. scalare* that has provided the genetic stock for all of the myriad color/finnage mutants presently sold in the aquarium trade. Both *P. altum* and, particularly, *P. leopoldi* are rather rare in the hobby, and have been spawned only occasionally. This is because wild angelfish, unlike their cultivar descendants, are rather demanding aquarium fish.

The Scalare

In 1911 *Pterophyllum scalare* was first imported live into Germany, and into this country in 1913 by way of Germany in a shipment arranged by members of the Brooklyn Aquarium Society (Nuoffer 1925). Apparently, one William L. Paullin of Pennsylvania was the first to successfully breed them and raise fry in 1917. His account is particularly interesting:

"I kept this pair in a 125-gallon tank, well planted with *Sagittaria* and kept the water at a temperature of 80 F, which was made possible by the use of a large oil stove kept burning directly beneath the aquarium. They first spawned in the summer of 1915, depositing the spawn on the underside of a blade of *Sagittaria*...It took about seven days before the little fish were able to swim about freely, but at this time I lost them all...This pair spawned four times in 1916 and each time I had nothing to show for it. This was most unpleasant and caused me to seek the cause of this great loss.

"After taking everything into consideration, I came to the conclusion that a constant supply of freshwater was what was most needed: hence in 1917 I made a gas hot water heater. This permitted me to have a constant flow of water and at any desired temperature. At the next spawning I placed the spawn in five-gallon glass jars, keeping the same supplied with a constant flow of water at 85 degrees. This constant flow of water kept the grass constantly in motion; the spawn hatched in regular time and at seven days were swimming free...At this period I cut off the running water, as I found they would be in danger of being washed over the tops of the jars, and I took no chances of losing them. In 1917 I raised about 250 and 300 in 1918; these I sent to various parts of the country." (Nuoffer 1925.)

A little ingenuity and a lot of patience paid off — thanks, Mr. Paullin. These were the starting population of most of the early cultivated strains.

Scalare are typically collected in whitewater habitats or in turbid black waters (Kullander 1986), usually in lakes or other slow-moving or still bodies of water (i.e., ponds, pools and so on: lentic environments). Typically, they are associated with sunken wood and/or aquatic vegetation that makes collecting difficult. Often they must be stunned as they sleep by bright light (flashlight, headlamp) and hand netted one by one. This informs us of our choice of aquarium aquascaping for wild-caught specimens.

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Because wild scalare can be quite aggressive (much more so than cultivar angels), and grow fairly large (about 4 to 5 inches long, 6 to 8 inches high), larger tanks are necessary. I recommend anything from 4 feet (60 to 90 gallons) to 6 feet (125 to 150 gallons) in length that is 18 to 24 inches wide. Water quality is important, but the water shouldn't be turbulent. Here is one case where a canister filter used in conjunction with internal air-driven box filters, or simple aeration, may do the job. Equally useful, and cheaper (and easier to maintain), are external power filters, but these shouldn't "blow" the fish around.

Although native whitewater can have average chemical parameters (e.g., pH = 7.2 to 7.4, moderate hardness), better success seems assured with slightly acid (e.g., pH = 6.5) and soft water, often with peat filtration as an adjunct (see Leibel 1993). The temperature should be kept in the low to mid 80 degrees Fahrenheit.

This is also an exceptional case for cichlids in which plants are recommended! These can be Amazon swordplants (*Echinodorus* sp.) or *Sagittaria* sp., perhaps potted, which provide shelter and a place for egg-laying. A centerpiece of bog wood is also helpful.

Food for wild scalare should include good-quality frozen (e.g., bloodworms) and live (e.g., earthworms) foods, as well as pelleted foods. Spawning can be induced, after conditioning the fish, at higher temperatures (around 88 to 92 degrees Fahrenheit) coupled with water changes.

I have yet to work seriously with wild scalare, and so have not had the good fortune to breed them. But my good friend and talented aquarist, Lee Newman of Vancouver, Canada, has, and I will share his observations with you.

For starters, he collected his own from the Rio Ucayali basin in Peru. He placed the eight adults he brought back into a 180-gallon aquarium that contained a base of fine sand and some driftwood. The angels were housed with several *Satanoperca* sp. ("jurupari"-type eartheaters) that enjoy similar conditions. The pH was 6.5, the water had less than 1 degree of hardness, and the temperature was maintained at 86 degrees Fahrenheit. (Unlike Paullin in 1917, he didn't need an oil stove to do that thanks to the marvels of modern aquarium equipment!)

The fish were fed a diet of pelleted foods, frozen bloodworms and live earthworms. After several months, a pair that had formed became extremely aggressive, taking over one-half of the 6-foot tank. The fish were behaving as though they wanted to spawn, but didn't.

On a whim, Lee submersed a cutting of a monstera house plant (a large, split-leaf tropical philodendron-type plant with broad flat leaves). They laid eggs on it within six hours! Regrettably, the first spawn of several hundred eggs fungused.

The colony of angels, this time minus the eartheaters, were moved to a 4-foot, 70-gallon tank set up with fine sand substrate, driftwood and "the largest plastic Amazon swordplant I could find." This time, two pairs spawned simultaneously: one pair on the driftwood at one end, and the second pair on the plastic plant. The remaining four angels clung to life in the demilitarized zone in the middle of the tank.

The fry were tiny and were unable to eat newly hatched brine shrimp until about seven days after they were free-swimming. They were fed infusoria created by the old "hay infusion" method that consists of letting hay (or a lettuce leaf) rot in a jar of water.

Small angelfish lack the dramatically produced dorsal and ventral finnage that characterize the species, and only acquire these as they grow. The breeding scalare were extremely parental, with the male even threatening onlookers through the glass (they were behaving like real cichlids). They moved their wrigglers around the tank, typically hanging them on the driftwood or the plastic plant via the adhesive glands on their heads, which secrete a mucilaginous "glue" (see photos of this in White 1975). Interestingly, even after the fry were free-swimming the parents gathered them just before "lights out" and attached them by their heads to a leaf. After about 11 to 12 days post-spawn the parents abandoned care and prepared to spawn again, which they did — cyclically — every 15 days.

Altum Angels

Anyone who has seen altum angels (*P. altum*) will attest to the fact that they are quite distinct from *P. scalare* and much more beautiful and delicate. For starters, they grow quite a bit larger than the average *P. scalare*, reaching vertical heights (anal fin to dorsal fin) of 12 to 15 inches and lengths of 6 to 8 inches. The biggest altum angel I ever saw was a single specimen that swam in Jim Forshey's community tank in Shingle Springs, California. It was 8 inches long and 15 inches tall!

The bars are brown to cinnamon in color rather than black, wider, and continue into the tail and the soft portions of the dorsal and anal fins (*P. scalare* fins are clear). And their heads have a distinctive "notch" or dip right above the eyes (superorbital) that makes their mouths look long and pinched. (Some populations of *P. scalare* share this trait to a lesser extent, as noted above.)

The altum angel hails from the Upper Rio Orinoco in Venezuela and Colombia, and the Rio Negro of Brazil, with water conditions that are similar to those for discus. That is, the pH is under 6.0, there is hardly any measurable hardness, and water temperatures are 86 to 88 degrees Fahrenheit (Stawikowski and Werner 1988). This, in part, is what makes altums more delicate and difficult as aquarium inhabitants.

There is, however, another factor: they apparently ship poorly and are prone to sudden death by some "stealth" (possibly viral) agent. In other words, they may look good one moment, and go belly up for no apparent reason the next. At least that has been my experience with newly imported stock direct from the wholesaler.

I recommend that you buy only specimens that have been living in your dealer's tanks for awhile, and I'd certainly recommend quarantining any new altums you wish to add to an established colony. I've made all these mistakes myself!

As for their husbandry, the general outlines for *P. scalare* detailed above are fine with respect to tank size, setup, filtration and feeding. In addition, very soft, very acid water (perhaps even reverse osmosis water) is recommended, coupled with peat filtration and higher temperatures. Think wild discus here. (But don't keep them together.)

As for breeding them, it has been the fondest hope of many advanced breeders, but only very few have succeeded. I know of only one breeder who has achieved that goal (or so he says), and I know of several very accomplished cichlid aquarists, even those who have made a commercial go of angelfish/discus breeding, who are still trying. Nevertheless, a large tank set up just for a colony of altums (eight to 12) is a thing of rare beauty, and I'd highly recommend it.

The "Dumpy" Angel

It is unfortunate, but *P. leopoldi* has sometimes been known in the hobby as the "dumpy" angelfish on account of its squatter, more elongate body and less dramatically extended dorsal and anal fins. Nevertheless, the fish usually sold as *P. dumerilii* in the hobby (noted earlier) is a charming, if rare, fish. It hails from the Rio Solimoes/Amazonas and from the Rio Rupununi in Guyana, and is rarely imported.

It is distinguished by its shape, as reviewed above, and by the presence of a dark blotch on the fourth vertical band on the dorsum just below the point of dorsal fin insertion and on the fin itself. *Pterophyllum leopoldi* presents few difficulties as an aquarium resident if kept like *P. scalare*.

This species has been bred on occasion, and tank-raised juveniles are offered in the hobby on an irregular basis. They continue to be coveted by dedicated angelfish enthusiasts, but regrettably are rarely imported.

Conclusion

While cultivated strains of angelfish continue to enjoy popularity among aquarium hobbyists, their wild progenitors —

debatably less colorful — offer a more advanced and interesting alternative for the serious South American cichlid aficionado. As a cultivated form, it is a relatively easy cichlid to handle and breed in the home aquarium. Wild angelfish are much more challenging and behaviorally more rewarding because they haven't had the "cichlid" bred out of them!