

Cichlids of the Americas - South American Eartheaters: The "Honorary" Eartheaters

Yeah, they're eartheaters, kind of...

By Wayne Leibel

In the preceding six installments of this series, we have considered the South American eartheaters, former members of the genera *Geophagus* and *Gymnogeophagus* as previously understood pre-Kullander. You will recall that the geophagine lineage was distinguished by the presence of a distinct lobe on the first gill arch, as well as rakers on the margins of the gills that allow for the sifting of substrate for food that lent the vernacular name "eartheater" to these fishes.

There are several more fish that qualify as eartheaters, although the details of their gill morphology suggest that they are more distant relatives. These include members of the genera *Biotodoma*, *Retroculus* and *Acarichthys*. The subject of this installment on eartheaters will be these "honorary" eartheaters.

The Cupido Cichlid, the Genus *Biotodoma*

At the time of Gosse's (1975) revision of the genus *Geophagus* there were two species, *cupido* Heckel (1840) and *wavrini* Gosse (1963), populating the genus *Biotodoma*. Originally, *cupido* was placed in the genus *Geophagus* by Heckel. However, Guenther (1862) removed it from *Geophagus* and installed it in the new genus *Mesops*, erected chiefly for it on the basis of its anomalously short snout. Unfortunately, the name *Mesops* had already been used for a genus of beetles! Therefore, Eigenmann and Kennedy (1903) replaced *Mesops* with *Biotodoma* as the generic name.

Biotodoma translates to "living home" and was apparently chosen to describe what these authors believed to be the reproductive behavior of *B. cupido*, namely mouthbrooding. Nice try! We now know that *B. cupido* is a substrate spawner (Wickler 1966; Cichocki 1976, 1977; Schultz 1990)! In fact, as Gosse's (1975) revision suggested, there are more differences than simple snout length separating *Biotodoma* from *Geophagus*: *Biotodoma* spp. have two supraneurals (dorsal fin skeletal elements) compared with one, and while *Biotodoma* do have the gill lobe, it is not as prominent as that of *Geophagus* or *Satanoperca* (Kullander 1985). Kullander (1985) suggests that *Biotodoma* is more closely related to *Geophagus* (i.e., the "surinamensoids") than to *Satanoperca* (i.e., the "juruparoids").

There are currently at least three well-defined *Biotodoma* species in the hobby. These include *B. cupido*, *B. wavrini* and a number of other "cupido" variants that should be called, for the time being, *B. cf. cupido* or *B. sp. affin. cupido* (cf. or sp. affin. means "looks like, but we're not sure if it is"). All of the *Biotodoma* species attain maximum lengths of around 4.5 to 5 inches, are rather elongate in the sense of the "surinamensoid," have large eyes relative to their foreshortened snouts, and all have mouths located in the center of their heads (terminal mouths), which portend a habit of "picking" rather than "sifting." I will describe the "cupido" cichlid, *B. cupido*, the most commonly encountered baseline species from which to differentiate *B. wavrini*.

Biotodoma cupido hails from Amazonia and thus is a not uncommon contaminant of shipments from Peru or Brazil (Manaus), often mixed in with *Satanoperca* or *Geophagus* from these areas. Young specimens are generally thin, bedraggled, gray, nondescript fish with the characteristic mid-flank ocellus (black spot ringed in white) and the vertical eye-cheek "bandit" stripe — their only selling points.

Things do not improve for many months thereafter. It is the experience of many that *B. cupido*, while eventually acquiring a hearty appetite in the aquarium, never seems to fill out, and grows painfully slowly. Moreover, their drab coloration (your basic gray fish) and sometimes bellicose disposition have led many aquarists, including myself, to take them to auction well before any reproductive behavior is in evidence. Those aquarists who have persevered, and I finally did so, have been rewarded with a dramatic aesthetic metamorphosis that occurs around the second year of life. A white-edged lyrate tail sprouts and a beautiful, coppery-gold saddle develops complementing the electric-blue vermiform markings that develop on the snout — a simply breathtaking fish!

Biotodoma wavrini is similar in markings and colorational history. However, *B. wavrini* is an elongated version of *B. cupido*, and while it too has a flank ocellus, the spot is located below the upper lateral line, near the midline of the body, whereas in *B. cupido*, the ocellus is positioned on and above the upper lateral line, just below the soft dorsal fin. As is true of *B. cupido*, *B. wavrini* is usually imported as young, bedraggled, gray individuals, but the positioning of the ocellus is the diagnostic that will enable you to distinguish the two species. Additionally, *B. wavrini* is collected in the Guyanas and the Orinoco, so look for it in shipments from Guyana and Venezuela/Colombia.

When it matures, and it does so just as slowly and painstakingly as *B. cupido*, *B. wavrini* takes on an overall iridescent blue cast with the same facial vermiculations and bandit eye-cheek stripe. The tail is produced into very long lyrate filaments that vary in color from white to blue. Additionally, in exceptional species, there are radial blue/white stripes in the rest of the tail. A truly elegant animal!

The other *Biotodoma* "species" are simply variants on the theme and can be sorted easily into cf. *cupido* versus cf. *wavrini* based on the positioning of the flank ocellus. I direct you to the excellent photos in Stawikowski and Werner (1988) of some of the various color varieties. The differences seem to be mainly adult coloration as a reflection of where the fish was collected.

One geographic variant that may well prove to be a distinct species has been imported recently from the Rio Tocantins/Rio Xingu area and has been sold as *Biotodoma* sp. "red fin santerem" or "red fin tocantins" in the trade over the last two years. This fish seems to be a "cupido"-type given the positioning of the ocellus. However, the body sports a series of double vertical bars extending from the lateral line down to the ventrum, and the tail of mature fish is produced into dramatic upper and lower filaments edged in white, with the radial striping of *B. wavrini*.

Schultz (1990) describes them thusly: "Their bodies and fins are painted with various pastel shades of blue, green and yellow. The males have red in their caudal fins. Their gorgeous coloration varies greatly in accordance with their mood." I've seen (and kept) them and she's correct. This is definitely a fish worth having, and the only *Biotodoma* spawned in America to date (Schultz 1990; see below).

In the aquarium, *Biotodoma* are best treated like *Satanoperca*. That is, keep them clean and hot! According to Cichocki (1976, 1977), who observed these fish in the wild, *B. cupido* inhabits very soft (less than 1 DH), acidic (pH of 5 to 6), warm (80 to 84 degrees Fahrenheit) water. Attention to quality is highly appropriate here, so consider a variety of filtration options.

Because they pick rather than sift, they are fine in a planted tank. In fact, they seem to prosper under these conditions. They tend to be somewhat scrappy, so provide some shelter for individuals in the form of bogwood, flowerpots or PVC tubing.

Feeding can be a problem at first. Dry food is definitely out, at least initially. Frozen bloodworms and/or glassworms are eaten with obvious relish and are foods of choice. Frozen brine shrimp is not. One way to get those new imports to eat is — believe it or not — to provide live baby brine shrimp. Despite the disparity in size, 1- to 2-inch *Biotodoma* will ravenously seek out and eat the swimming nauplii. After a week or so of this, you can switch them over to frozen foods and, eventually, they may take some prepared foods or freeze-dried krill. But really, I recommend a staple diet built around frozen bloodworms. Nini Schultz (1990), who spawned the "red fin tocantins" species, additionally included beefheart, earthworms and frozen brine shrimp on the menu. What do I know?

Both Cichocki (1976, 1977), based on field observations of breeding pairs, and

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Wickler, W. 1966. Sexual dimorphism, paarbildung und verstechbruten bei cichliden. *Zoo Jahrb Sys* 93:127-138. Loiselle (1967), based on aquarium observations, have suggested that mature *B. cupido* are sexually dimorphic with respect to the blue, vermiform facial markings. Males are reported to have blue lines, whereas females have spots. I have always found this characteristic less than reliable in assigning gender to my colonies of *Biotodoma*.

Although I've yet to spawn any *Biotodoma* species, what I would describe as courtship behavior (head-tail wagging, genital butting, etc.) has taken place between fish whose supposed sex was not predicted by their facial markings. Then again, I've never spawned them. Nini Schultz (1990), who has, confirms the "lines" versus "spots" dimorphism. So, if you have a large number of individuals to select from in your dealer's tank (that'll be the day!), pick "lines" and "spots" to assure both sexes. It certainly couldn't hurt.

Although both Amazonian *B. cupido* and *B. sp. "red fin santarem"* have been spawned in Europe, it is only the latter that has been captively bred in this country by Nini Schultz in New Jersey. You can read her spawning account yourself (Schultz 1990), but for those of you who are not yet members of the American Cichlid Association and thus without access to its fine bimonthly journal, *Buntbarsche Bulletin* (a temporary situation I hope — see accompanying sidebar in this article), I will share the basics of her experience.

Mrs. Schultz's fish grew from 2 to 4 inches (with the females ½ inch less) in approximately nine months in a 125-gallon community, including young discus, rainbowfish and a variety of catfish. She removed a pair, sexed by the "line/spot" method, into a 30-gallon tank and began to condition them. After a few weeks of conditioning, the male began to move gravel and actively court the female, without injuring her.

Soon after a partial water change, the pair laid 100 small light-pink eggs directly on the bottom glass in the center of a pit dug into the gravel. Cichocki (1976, 1977) described spawning in elongated pits in the wild. Although the female tended the spawn, the eggs vanished. Two more such inconsequential spawnings occurred at one-month intervals, and the pair was returned to the 125-gallon community tank. There, they eventually spawned, with both parents tending and guarding the spawn. At no time did they uptake the eggs or fry for incubation. Eventually, the wrigglers disappeared.

The pair was then moved to a 55-gallon tank where, again, they began excavating the gravel. Each time they dug a pit, Mrs. Schultz put a flat stone at the bottom as a receptacle. Finally, they spawned and the female chased the male away and kept him at bay. Several hours later, the female began to eat the eggs, so the stone on which they had been laid was removed to a 5-gallon tank with aeration and acriflavine. The eggs hatched and were free-swimming at five days.

The fry were too small to take newly hatched brine shrimp, so they were fed dried egg yolk for the first few days. Mrs. Schultz was able to raise about 35 fry from this spawning and noted that their growth was slow. She has had several more spawnings since. The water conditions at spawning were pH — 6.4, hardness — 120 parts per million, and temperature — 80 degrees Fahrenheit. Quite a feat! Hopefully her approach can be used with advantage in spawning *B. cupido* and *B. wavrini*. One ingredient she doesn't mention, and which I'm sure figures largely in the rearing and spawning of these fish, is patience.

Goby Eartheaters, the Genus *Retroculus*

Here is one of the mythical fishes of the hobby. My first encounter with it was a reproduction of the hand-colored print of *Retroculus lapidifer* from the original description by de Castelnau (1855), which appeared in Loiselle's (1980) review of the eartheaters. At that time, no one — at least no one in the aquarium hobby — had set eyes on live specimens of this fish. The print depicted a curious fish that looked more perch-like than geophagine. I could only wonder how this fish could be an eartheater.

Retroculus lapidifer was first described as *Chromys lapidifera* by de Castelnau (1855). De Castelnau apparently did not report on the morphology of the gills, so Guenther (1862) promptly moved it to Heckel's genus *Acara*. A bit later, Steindachner (1875), apparently never having seen the fish with his own eyes, nevertheless suggested that it bore a close affinity to *Satanoperca acuticeps* and should be placed in *Satanoperca* (or *Geophagus*, depending on your taxonomic stance).

This point of view was formalized by Eigenmann and Bray (1894) in their catalog of South American fishes. These authors erected the genus *Retroculus* for their new species *boulengeri* and suggested, again, affinities with *Geophagus* without mentioning anything about the presence or absence of an epibranchial lobe (why no one looked is a mystery to me!). They also didn't mention de Castelnau's *lapidifera*.

It took C. Tate Regan, in 1906, to actually open up the specimen of *R. boulengeri* and note the peculiar lobe on the first gill arch that spelled "geophagine." It was also Regan who synonymized *R. boulengeri* with de Castelnau's *lapidifera* and referred to it formally as *Retroculus lapidifer*. Subsequent students of South American cichlids followed Regan's lead.

Since that time, two other species, *xinguensis* and *septentrionalis*, both described by Gosse in 1971, have been installed in the genus *Retroculus* in a paper from whence I have taken the preceding history. *R. lapidifer* is known from Brazil, in particular the Rio das Mortes in the Matto Grosso. *R. xinguensis* (pronounced in Portuguese, shin-gwen'-sis) is described from waters of the Rio Xingu in Eastern Brazil. *Retroculus septentrionalis* is described from the Rio Oyapock in French Guiana, but apparently is restricted there and not generalized throughout the Guyanas.

Although *Retroculus* share with the real eartheaters the characteristic lobed first gill arch, they do not have rakers on the free edge of their gill arches, the morphological character responsible for "sifting" in the geophagines. Gosse (1971) suggests that *Retroculus* are near relatives of both *Geophagus* (broadly defined) and the last fish we will discuss, *Acarichthys heckelii* (see below). Now that we've got the science done, let's talk about the fish!

Retroculus lapidifer first appeared in Europe in 1987, brought back from the Rio das Mortes by enthusiastic German aquarists, including Uwe Werner and Rainer Stawikowski. The first color photos appeared in their book (1988), which we in the states got later that year. Shortly thereafter (Nini Schultz remembers it as late summer 1988), *Retroculus lapidifer* and *R. xinguensis* were shipped sporadically out of Belem/Santarem along with the magnificent pleco-type catfish from this area and the *Biotodoma* sp. "red fin" discussed earlier.

Given the de Castelnau (1855) painting, I was not prepared for the live fish! The fish, in fact, looks like a *Geophagus* that has been stretched: they are long and low. The lips are relatively huge even for an eartheater, and underslung, despite de Castelnau's painting. The body color is a pleasing iridescent violet, with metallic, random gold spotting and a few sparse iridescent-blue facial vermiculations — in particular, a pair of oblique stripes passing below the eye. The tail is heavily scaled (as de Castelnau said) and there is a black "Tilapia-spot" on the soft dorsal fin that comes and goes. In all, quite a lovely and curious animal.

What's particularly intriguing about these fish is their behavior. All of the *Retroculus* species hail from shallow rapids. As is true for cichlids from analogous habitats, for example *Teleogramma* in Zaire and *Teleocichla* in Brazil, there has apparently been a reduction in the swim bladder and concomitant adoption of goby-like "hopping" locomotion.

Retroculus lapidifer does indeed hop about the tank and, while it most assuredly can swim (they chase constantly and do take freeze-dried krill off the surface), they seem most at home perched on their broad pelvic fins hopping from spot to spot as they take mouthfuls of sand, presumably searching for food. And that behavior is remarkable in itself.

They hop up, orient themselves head down — with mouth open — and drop into the sand like a pile driver, propelled by gravity and their own body weight. They come up with a mouthful of sand and blow it out their gills like a typical eartheater. How they sift it without gill rakers, I'll never know.

Between chasing and sifting they often stop and pose on the driftwood in their tank before hopping off and doing

Retroculus things. For this reason, I proposed the name "goby" eartheater for these remarkable fish (Leibel 1989).

The imported fish have all been in the 2- to 4-inch range, and while mine actively courted at 5 to 6 inches, they probably had a ways to go. Gosse (1971) cites a record 235-millimeter standard length (that's without the tail) male, so they obviously can grow to total lengths of more than 10 inches. In fact, Nini Schultz, who is the only American aquarist I know of who kept hers more than one year, raised a supposed pair to about 7 inches. They courted but never spawned.

There is some debate amongst us as to whether, in fact, hers are *Retroculus xinguensis*, because their coloration was quite different from the published photos of *R. lapidifer* and the fish I've had. To the best of my knowledge, no spawning accounts have yet appeared in German print. De Castelnau (1855) reported the propensity of this fish to construct pebble nests, hence the name *lapidifer* ("bearer of stones"), so they may well prove to be substrate spawners.

As you can tell from my narrative, I finally lost mine after more than one year of growth. Unfortunately, besides the four or so shipments over the past two years, no *Retroculus* have appeared this year. I'd love to get them again.

This time I'd house them in a 100-plus-gallon, 5- or 6-foot tank with a trickle filter and lots of power filters/heads to simulate the rapids and increase oxygenation of the water. I'd also try keeping them at lower temperatures — about 70 to 75 degrees Fahrenheit. I believe "clean" and "well-oxygenated" are the operative terms here. The fish never were any problem to feed — they took everything and grew well. They were reasonable community tank fish and, despite sparring with each other, kept hopping fast enough to avoid serious harm. Here's one fish to dream about.

Heckel's Thread-Finned Acara, *Acarichthys heckelii*

The genus *Acarichthys*, as currently understood, contains a single species: *heckelii* Mueller and Troschel (1848), a fish I dubbed Heckel's "thread-finned" acara (Leibel 1984). This fish was originally placed in Heckel's genus *Acara*, but later moved to *Acarichthys* by Eigenmann (1912), who erected this new genus for it.

The reason was simple. These acara-like fish have feebly developed gill lobes and a few rakers along the margins of the gill arches. So *A. heckelii* has affinities to both *Aequidens* (no lobe) — broadly defined — and to *Geophagus* (distinct lobe), and is viewed as an evolutionarily transitional species. In fact, it looks like a chimeric cichlid with aspects of both acaras and eartheaters.

For awhile, the genus *Acarichthys* was occupied by two species. You may recall from Part 6 of this series that "*Aequidens*" *geayi* was bumped by Sven Kullander into the genus *Acarichthys*, but Kullander giveth and he taketh away. The "geayoids" are now grouped in their own genus *Guinacara*, erected for them by Kullander and Nijssen (1989). Interestingly, in Kullander's (1985) review of Peruvian cichlids, he suggests that, in fact, *A. heckelii* does not have a lobe on its first gill arch (!), but that the abundance of other geophagine characters suggests a closer affinity with the eartheaters than any other group. Obviously, I agree for reasons more of the gut than the mind — *A. heckelii* looks and acts like an eartheater — and so I consider it here in this installment.

Without a doubt, *Acarichthys heckelii* is an exceedingly attractive medium-sized cichlid — it reaches lengths of nearly 7 to 8 inches in the aquarium. The body is chunky and definitely not geophagine in profile. Like *Biotodoma* species, these fish have relatively small terminal mouths located centrally in the head. The base color of this fish is a medium green-gray, with a series of indistinct hexagonal splotches scattered regularly over the body: a "camouflage" pattern that is expressed darkly and distinctly in juveniles and submissive adults. A coppery-orange saddle extends from the gills backward to the dark mid-lateral blotch and from the dorsum downward to the belly region. The flanks are overlaid with parallel rows of brassy lines formed by the iridescent centers of each scale, a pattern strongly reminiscent of *Satanoperca jurupari*. There is also a vertical eye-cheek "bandit" stripe. The gill covers are lightly spotted in metallic blue and the gill membranes darken to jet black during courtship and spawning.

What's really spectacular about this fish is its finnage. The unpaired fins are spotted in hyaline white dots and the last five to six rays of the soft dorsal fin are spectacularly produced and tipped in bright red, sweeping back past the tail in fine specimens (hence, the suggested common name: Heckel's thread-finned acara). The tail fin is produced to filaments on its upper and lower margins and the anal and ventral fins are bright orange-red, spotted in blue. These are dynamite "best-in-show" fish when reared in isolation.

Acarichthys heckelii is a fish that used to be available only as a contaminant, usually mixed in with *Geophagus* sp. "*surinamensis*," usually from Guyana, or with *Satanoperca leucosticta*. In fact, *A. heckelii* was described as *Geophagus thayeri* by Steindachner (1875), a name that was later (and obviously) synonymized. Strangely enough, that's also the name under which both *A. heckelii* and *G. sp. "surinamensis"* were often sold in the trade.

Those of us interested in the fish had to "piece together" colonies as single fish trickled in. Not that they are rare in the wild. On the contrary, Lowe-McConnell (1964, 1969) reported that these are one of the most common of cichlids in Guyana. They are also spread throughout the Amazon drainage. There just wasn't any demand in the hobby. That changed with the publication of a number of articles on this fish (Rasmussen 1983), including my own (Leibel 1984).

In addition, with the "secret" of their propagation now revealed, some success was had breeding them in ponds in Florida. These days, *A. heckelii* is available both as wild imports — imported and sold under their correct name (at much higher prices, I might add!) — and as pond-reared juveniles. This development is certainly a welcome one.

I am proud to say that I was, perhaps, the second person to spawn this fish. The first account was that of Baran (1981) in Germany. As you shall see, the problem was not the delicacy of the fish, but its rather unique style of reproduction. Fred Cichocki, then a graduate student under Robert Rush Miller at the University of Michigan, reported in his doctoral dissertation (1976) the peculiar reproductive habits of this fish based on hours of snorkeling in Guyana.

Acarichthys heckelii is, apparently, a tunnel-spawning cichlid! Females compete for territories and dig tunnels down into the mud bottom. Cichocki describes these as having almost vertical entry shafts that grade into horizontal tunnels of 5-to 20-inch lengths, which lead to a larger, central nuptial chamber where the eggs will actually be laid. There may be several openings to this central chamber and several blind side chambers. The entire arrangement is strangely reminiscent of gopher excavations.

Once the tunnel complex has been excavated, ripe resident females actively solicit males who happen by ("Hey, Big Fins, why don't you come down and see me sometime?"). Once a male is selected and he accepts, the pair court and defend their three-dimensional territory. Following a protracted courtship, whose components Cichocki (1976) exhaustively detailed, between 1000 and 2000 eggs (!) are laid on the roof and walls of the "underground" nuptial chamber.

Fanning the clutch is the female's job, while the male runs perimeter defense topside. Following hatching and free-swimming stages, the parents continue to guard their fry using the burrows as a kind of "mouthbrooding shelter" — the fry stream into the tunnels when signalled of approaching danger by the parents. The fry eventually disperse to grow in the weeds near shore. Once vacated, the burrow may be claimed by another ripe female, who will defend and use it.

Egad! How to duplicate this in the aquarium? I just couldn't handle the thought of 2 feet of garden soil in the bottom of a 150-gallon tank. Aware of the postulated relationship of *Guinacara geayi*, a cave-spawner, and *A. heckelii*, I thought that a giant overturned flowerpot (nuptial chamber) with a hole knocked out as the entrance might do the trick. As I was to learn later, after the fact, Baran's (1981) spawning occurred in an inverted 10-inch diameter candy jar. I should add, at this point, that the fish in question were adults of nearly 6-inch length and that I conditioned them on a rich diet of frozen and prepared foods, with unlimited quantities of live red earthworms predominating.

Although *Acarichthys heckelii* is a relatively undemanding aquarium resident, they can be unpredictably combative. I went through more "compatible" pairs that became singletons when the male, one morning — for no apparent reason — woke up on the wrong side of the flowerpot and liquidated his mate. Hopefully, ensuing generations of pond-bred fish have proven less bellicose.

To make a long story considerably shorter (and you can read the original long story if you choose: Leibel 1984, 1987), a combination of frequent massive water changes — coupled with purposefully fluctuating temperatures between 78 and 96 degrees Fahrenheit — finally triggered a spawning. The female pasted a thousand or so eggs — no kidding — on the sides and ceiling of the 12-inch diameter pot. Within 24 hours of the spawning, I noticed that several hundred of the eggs had detached from the pot and were rolling around in the bottom of the pit the pair had dug, with the flowerpot as the focal point.

I siphoned these out and reared them in a sponge filter hatcher of my own design. The fish ultimately ate the rest of the eggs, but the ones I removed proved fertile and the young were raised on newly hatched brine shrimp with no incident. The youngsters grew slowly at first, but once weaned onto dry food they grew rapidly from then on.

Juvenile *A. heckelii* are conspicuous for the previously mentioned "camouflage" pattern and for the flag-like black and white marking on the first few rays of the dorsal fin. Cichocki (1976) reports that underwater this marking is fluorescent and can be seen for many meters. It probably acts as a semaphore that promotes the schooling of these very gregarious, highly social juveniles. Oh, if only they stayed that friendly!

These tank-reared offspring were distributed throughout the cichlid hobby. My good friend and expert breeder, Dolores Schehr of Detroit, raised up a flock and got successful spawnings using a large-diameter piece of PVC tubing, stood on

end. The parents never reared the fry, but she was able to snatch the tube from the tank and raise a second generation. I understand that some of these grandchildren ended up in Florida, where they provided part of the nucleus for the pond-reared stock currently available.

I must add that I never repeated the spawning of wild *A. heckelii*, though I tried. Beginner's luck. I have heard of several recent successful spawnings of this fish and am hopeful that it will soon be established as a staple in the hobby in much the same way that *Gymnogeophagus balzanii* is.

Conclusion

With this installment, we wrap up coverage of the South American eartheaters per se. However, as a true addict, I must do so gradually. In another installment of Goin' South we will consider some aspects of mouthbrooding as a reproductive strategy, and then follow that up with an article on "dwarf" eartheaters of the genus *Apistogramma*! At least, I'll argue that they are.

About the ACA

Readers of AFI interested in learning more about cichlids are encouraged to join the American Cichlid Association. Many of the reference materials from *Buntbarsche Bulletin*, *The Journal of the American Cichlid Association*, are available to members only through their back issues sales program. For additional information please forward a stamped, self-addressed envelope to Glenn Eaves, ACA Membership Chair, P.O. Box 32130, Raleigh, NC 27622.