Keeping Up:

A Reconsideration of the
Genus Gymnogeophagus

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Introduction

The genus Gymnogeophagus was erected by Ribeiro in 1918 to accommodate the new species cyanopterus (= balzanii Perugia 1891). The generic nomen translates to "naked Eartheater" and refers to the character used by Ribeiro as a diagnostic for his new genus; the absence of cheek scalation. Although Ribeiro's genus was disregarded by subsequent cichlid systematists (eg. Fowler, 1954). Gosse (1976), in his revision of the genus Geophagus, embraced Ribeiro's taxon, and added three additional species, australis, rhabdotus, and gymnogenys, all formerly placed in Geophagus, to it. Gosse (1976) redefined the genus to include two skeletal characteristics of dorsal fin insertion that occurred along with unscaled cheeks: the absence of supraneurals, and the presence of a forward directed spine on the top of the first dorsal pterygiophore (see figure 2). Pterygiophores connect dorsal fin rays with the neural spines of the vertebral column and supraneurals are pterygiophore-like elements which precede the dorsal fin (and pterygiophores) but which do not articulate with dorsal fin rays. Biotodoma species have two supraneurals, Geophagus species have one, and Gymnogeophagus species have none, while the two former genera have no forward-directed spine on their first pterygiophore (Gosse, 1976). (In fact, the antrorse spine is unique to Gymnogeophagus among the Neotropical Cichlidae.) Obviously, these diagnostic characters cannot be eyeballed on living specimens and fall the esoteric provenance of professional ichthyologists who seem compelled to take dead fish apart in an attempt to confer order on them.

A recent paper by Reis and Malabarba (1988), Revision of the Neotropical Cichlid Genus Gymnogeophagus Ribeiro, 1918, with Descriptions of Two New Species (Pisces, Perciformes), Revista Brasileira de Zoologia 4 (4): 259-305, enlarges the genus Gymnogeophagus to include 7 species, four old, two new, and one resurrected from synonymy. Further, new descriptions of all 7 species, including life colors of newly-collected specimens of 6 of these, are given which again throw into doubt previous assignment of the nomina australis, rhabdotus, and gymnogenys to living fish in the hobby. In this short essay I hope to share the results of this revision as they apply to fishes currently in the hobby and to fishes which may well be imported in the future from the Argentine-Paraguay-Southern Brazilian (Rio Grande do Sul) axis along with staples from this area like Gg. balzanii, Aeuidens (Laetacara) dorsiger, and Cichlasoma (Heros) facetum.
Species of the Genus
Gymnogeophagus

Gg. balzanii. The identity of only one Gymnogeophagus species, Gg. balzanii (=duodecimspinosus Boulenger 1895, and cyanopterus Ribeiro 1918), is unambiguous and secure in the hobby. Reasonable photos exist throughout the hobby literature (see Leibel, 1983 for a listing) and the species is sufficiently distinctive in appearance, particularly the huge nuchal crown of reproductively-active males, that there is no reason for confusing this fish with any Geophagine yet in the hobby. Gg. balzanii is a harem-spawning delayed mouthbrooder whose reproductive behavior has been exhaustively documented (Richter, 1973; Leibel, 1983, 1984) since its initial importation in 1973 (Paraguay; Socolof 1974) and again in 1981 and thereafter (Argentina). The fish has proven relatively easy to breed and pond- or tank-reared stock is routinely offered by wholesalers and dealers these days.

Gg. gymnogenys. Gymnogeophagus gymnogenys is, historically, one of the first of the Geophagines to have been imported (along with Cichlasoma (Heros) facetum) and bred around the turn of the 20th century. Sterba (1966) cites 1900 as the initial importation date of this fish into Germany and line drawings, some colored, appear in the early literature (e.g. Holly et al., 1932, Peters 1935). Our classical interpretation of what Gg. gymnogenys (Dunklen Perlmutterfisch: "dark mother-of-pearl fish") is, a somewhat elongate Geophagus brasiliensis (Perlmutterfish) lookalike from the La Plata basin often with a pronounced nuchal crest, would seem to be erroneous in view of the Reis and Malabarba revision. I, among others, am guilty of propagating misidentification of this fish. In 1984 I received and maintained a fish I believed to be the
real *Gg. gymnogenys*. Superficially, the fish resembled *G. brasiliensis* in coloration (typical blue pearl spangling), however the male was more elongate than what I had previously kept or seen as *G. brasiliensis*, he developed an impressive nuchal knot at about 5 inches TL, and expressed the diagnostic black vertical eyeband that Gosse (1976) had figured. The female remained much smaller than her consort (c. 3 inches TL) and when they spawned, they were typical non-mouthbrooding substrate spawners. Photos of these fish were circulated as slides #62-1 (male) and #72-2 (female) in the ACA Slide Series (see figure 3). Recently, photos labeled *Gg. gymnogenys* have appeared in the DCG (Germany) Deutsche Cichliden-Gesellschaft (K. Stieglitz, *Gymnogeophagus gymnogenys ist Maulbrauter*, December, 1987 Vol. 18 (12): 238-243) and in the new Stawikoski and Werner (1988) book, *Die Buntbarsche De Nuen Welt*. The fish so depicted matches exactly the drawing in Gosse (1976) and the photo in Reis and Malabarba (1988). Furthermore, the “German” *gymnogenys* is reported to be a mouthbrooder which is confirmed by Reis and Malabarba's capture of a female with a mouth full of fry.

After seeing the DCG article, I promptly purchased a large number of rather expensive tank-raised “*gymnogenys*” juveniles imported from Germany only to discover, upon grow-out, that these were not the fish in question: I'm not sure why I was surprised. Anyway, the real *gymnogenys* reaches standard lengths of at least 5 inches (125 mm largest recorded in Reis and Malabarba 1988). The fish do resemble a very elongate *G. brasiliensis* with eight rows of small nacreous blue spots (pearly scale centers) on an olive-colored to yellowish background.

Schematic showing antrorse spine (as) on dorsal pterygiophore (pt) and position of supraneural(s) (sn). *Geophagus* on left, *Gymnogeophagus* on right. (ds, dorsal spine; ns, neural spine) After Reis and Malabarba (1988).
Like brasiliensis, there is a large, black mid-lateral splotch. Unlike brasiliensis, there are a series of 5-6 transverse double dark cross bands on the flanks which are a part of the stress pattern, and, in my photocopy, a dark transverse band just behind the nuchal crest (also in DCG photo) which, in reproductively-active males, is relatively huge (much larger than any I've seen in G. brasiliensis). The females are very elongate, have a convex head profile and look nothing like female brasiliensis (Stieglitz, 1987 photo). It is a lovely and distinctive fish and one can only hope that the European exporters will eventually see fit to send the real gymnogenys, or that the fish will turn up as a contaminant in an Argentine shipment (it has been collected in Uruguay, Argentina, and Southern Brazil). Don't pass up juvenile "brasiliensis"-like fish that come in mixed with wild Gg. balzanii, Ae. dorsiger or H. facetus from the La Plata drainage: check for the "double bands" when stressed.

Gymnogeophagus gymnogenys may, in fact, prove (as suggested by Reis and Malabarba) to be a species group. Several distinctive populations were collected that varied in body proportions and coloration. More to the point, one of the new Gymnogeophagus species, lacustris, and the old species labiatus removed from synonymy with gymnogenys, are clearly closely related and probably constitute a species complex.

Gg. labiatus. Hensel (1870), in the same paper in which he described gymnogenys, also described Geophagus pygmaeus and G. labiatus. Both species were synonymized with brasiliensis by Steindachner (1874) and later placed in synonymy with Gg. gymnogenys by Gosse (1976) following his reexamination of the type specimens, but the former, pygmaeus, is retained as a
junior synonym of *gymnogenys* by Reis and Malabarba (1988) while the latter, *labiatus*, was judged by them to be sufficiently different to warrant resurrection of this taxon. Interestingly, two further *Geophagus* species described by Hensel (1870) in the same paper, *bucephalus* and *scymnophilus*, have been synonymized with *labiatus* by Reis and Malabarba (1988). Kullander (1981) originally suggested that this fish should be granted valid species status by virtue of several characters, predominant amongst them the huge orange lips that are quite conspicuous in the photo offered by Reis and Malabarba.

*Gg. labiatus* resembles *gymnogenys senso* Reis and Malabarba (1988) in most details of its appearance excepting the hypertrophied lips. In addition, the species sports 9 double, dark crossbands which are quite distinct in the photo of what I presume to be a female (SL 101.8 mm, largest examined was 138.3 mm SL) offered by the authors. No mention is made of a prominent nuchal knot even though many examples of many size specimens from many localities were examined (“Predorsal profile convex, often with straight segment above eyes. Body contour at dorsal fin base gently arched.”). The reproductive behavior of this fish is apparently not known. The fish was collected from southern Brazil in a region which is not commercially collected so, unless zealous amateurs or sympathetic ichthyologists collect and introduce live specimens to the hobby, *Gg. labiatus* most likely will not grace our aquaria anytime soon.

**Gg. lacustris.** A third species, perhaps referable to a hypothetical "gymnogenys complex", is *Gg. lacustris*, newly-described by Reis and Malabarba (1988). The fish was collected from Southern Brazilian coastal lagoons, hence the specific nomen meaning “of a lake.” The standard length of collected material ranged from 48 to 146 mm. The body is very elongate and, in my photocopy, the holotype, presumably a male of 136 mm SL, sports a huge nuchal hump not unlike that of *Gg. balzanii*. Again, live specimens express 9 double dark cross bands and a dark nape-eye band. The flanks are pearl spotted and the lips of large nuptial males are deep orange. The unpaired fins sport white-bluish bars and/or dots. Additionally, *Gg. lacustris* is apparently a mouthbrooder: a live specimen was observed buccally-uptaking young in the wild. Again, regrettably, the occurrence of this species is limited to areas not normally collected by commercial exporters so the future availability of this species in the hobby seems unlikely.

While the three species seem, to me, closely related in terms of appearance and reproductive behavior, Reis and Malabarba’s (1988) cladistic analysis indicates that *labiatus* and *lacustris* are closely related and split from *gymnogenys/australis* because the former share deep-orange lips and the latter share a broken nape-eye-cheek band (the nape band, present in *labiatus/lacustris*, is absent in *gymnogenys/australis*). It is, however, true that no live specimens of *australis* were collected or observed (see below) and, for my money, *gymnogenys, labiatus, and lacustris* form a natural species complex.

**Gg. rhabdotus.** Now we come to the crux of the hobby-related problem, the identity of fishes circulated as *australis* and *rhabdotus*. In a recent article (Leibel, 1987) I took Loiselle to task over his choice of the specific *australis* as the name for the fish being circulated in the American hobby as the “Rainbow Eartheater.” In that essay, I suggested that a newly-imported European fish, traded under the name *rhab-.*
dotus was, in fact, the true Gg. rhabdotus, that the LaCorte strain “Rainbow Eartheater” was most likely also rhabdotus, and that the gray, somewhat non-descript congener tagged “rhabdotus” by Loiselle (1980; see page 25 there, or Axelrod (1985), page 354) was probably australis. It would appear that I am both right and wrong.

The “Rainbow Eartheater” and the European “rhabdotus” are apparently the true Gg. rhabdotus. In anointing the LaCorte strain “Rainbow Eartheater,” Loiselle (1980, 1981), in part, based his assertion on the pair of narrow red-orange submarginal bands that grace the upper and lower margins of the caudal fin which had never been mentioned in color descriptions of rhabdotus. In the Reis and Malabarba (1988) revision, the Gg. rhabdotus “color in life” entry describes “caudal fin sometimes with roundish marks and often with both superior and inferior red edges.” Additionally, while all specimens exhibit “about eight longitudinal bright-blue stripes laterally on flank,” the specimens from the Rio Grande do Sul coastal lagoon system “may demonstrate a few small roundish bright-blue marks on soft dorsal and caudal fins, while the specimens from the headwaters of Rio Negro, near Bage, RS, have a very strong longitudinal striping.” The apparent colorational polymorphism in the European vs. LaCorte strain fish is, thus, accountable. In addition, the specimen photographed in the paper is a dead ringer for the European “rhabdotus.” So, the Rainbow Eartheater is apparently Gg. rhabdotus.

Gg. australis. What of its less-colorful congener? In my essay (Leibel, 1987), I suggested that this fish (rhabdotus sensu Loiselle) was, in fact, the real Gg. australis or at least cf. australis. It seems that I was both right
and wrong. I mentioned an apparent discrepancy in the size of the largest of Eigenmann’s *australis* types, 145 mm SL (c. 5.7 inches) and the maximum size of aquarium-reared fish (c. 4 inches TL). I concluded that either *australis* shows considerable geographic variation or that *cf. australis* is a new, undescribed species and the true, six-inch *australis* had yet to be imported into the hobby. It would seem that the latter is the real situation!

Eigenmann’s (1907) types, collected from Buenos Aires, Argentina, have been lost, but 3 existing paratypes from that collection were examined by the authors: regrettably, no living material was collected or examined so no life coloration description or photograph is available here. A photograph of an 110 mm SL paratype is included, but it is “presently quite discolored” (having been stored in alcohol for 100 years). Eigenmann (1907) wrote: “dark area across back in front of the dorsal; bases of some of the scales of the back frequently very dark brown; side with about six cross-bands, each of these on middle of side composed of double dark lines with a band of light of equal width between them; no dark spot on side; pectoral light; ventrals blue-black; dorsal dusky, with ascending light stripes which are largely replaced by light spots on the soft dorsal; caudal dusky, with round hyaline spot on the rays similar to those of soft dorsal; anal with similar but smaller and less distinct spots; no spot or ocellus on the caudal.” I add the following observations on the appended photo (with additional comments by Reis and Malabarba): the fish is considerably elongate but high-bodied compared to the *rhabdotus* immediately below it and the head rises steeply though angularly over the eye (“body slightly elevated and robust, laterally compressed. Predorsal contour elevated and strongly steep. Body contour at base of dorsal is gently arched.”). If I didn’t know better, I’d swear it was a badly-discolored *G. surinamensis*. It certainly - and emphatically - does not resemble either the Rainbow Eartheater or its drabber congener.

**Gg. meridionalis.** The latter apparently is a newly-described species, *Gg. meridionalis* Reis and Malabarba (1988), named after its southern distribution. According to the authors, this new species is the only *Gymnogeophagus* species found south of Buenos Aires. The range of standard lengths in the collected examples was 39.3 to 88 mm. A synopsis of their comments on life coloration include: six transverse, inconspicuously double bands with a dark midlateral splotch on the third band, just below the upper lateral line, a dark nape-eye band, 7-8 longitudinal blue stripes on flanks, abdomen yellowish to deep-orange, and light blue small roundish dots on reddish unpaired fins. The appended photo of an 80 mm specimen looks identical to the fish whose photographs appear with my essay (Leibel, 1987). The authors comment: “This species has been frequently misidentified as *G. australis* by some authors (Iwaskiew & Sendra, 1981 and Gosse, 1976). Besides aspects of color and body proportions, *Gg. meridionalis* may be readily distinguished from *Gg. australis* by longitudinal scale count.” So, Gosse (1976) was wrong too! I have exhumed several of the preserved corpses of *cf. australis* and find that they have 24 scale rows: *australis* = 27, *meridionalis* = 23-25, mode = 24 (25 of 36 specimens). Apparently, “*rhabdotus*” *sensu* Loiselle (1980; and Axelrod, 1985) corresponds to *Gg. meridionalis*. As their covegent coloration and general appearance might suggest to the average aquarist,
rhabdotus and meridionalis are most closely related to each other as Reis and Malabarba's cladistic analysis suggests.

**Conclusion**

So, in conclusion, Reis and Malabarba's (1988) revision of the genus Gymnogeophagus has considerable impact on the cichlid hobby. For starters, *caveat emptor* when it comes to purchasing *gymnogenys*: most, if not all are poseurs, really *Geophagus brasiliensis* morphs. The *real gymnogenys* does look like *brasiliensis* with its conspicuous pearl spotting, but, one placed in traction for several weeks. Additionally, it sports 5-6 transverse *double* dark bands, at least in its stress pattern, that no *brasiliensis* I've ever seen exhibits, and ripe males have a *huge* nuchal knot with a dark vertical band just behind it. If you're fortunate enough to propagate them, they are mouthbrooders. Now that I know what I'm looking for, I hope to bag and photograph the *real gymnogenys*. The Rainbow Eartheater (Loiselle, 1980) and the European "rhabdotus" (see Leibel, 1987) are apparently both *Gg. rhabdotus*. However, the drabber gray congener once called "rhabdotus" (Loiselle, 1980; Axelrod, 1985) and *australis* or *cf. australis* (Leibel, 1987), is the newly-described *Gg. meridionalis* while the *true australis* has not yet been knowingly imported. Coming, as they do, from Buenos Aires, it would seem collection of the *real australis* would be highly possible for the dedicated amateur so-inclined (Hmmm). Regrettably, such would seem not the case for either *lacustris* or *labiatus* because of their limited distributions. And, of course, *Gg. balzanii* is *balzanii* - a delightful, readily available Geophagine whose visage regularly graces the editorial masthead of this publication and one of this editor's favorite cichlids.

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*Gymnogeophagus meridionalis*, sp. nov. 

Leibel photo.

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*Buntbarsche Bulletin 129 / 25*
Acknowledgement

Special thanks to Lee Finley for bringing this article to my attention and for supplying a photocopy of it.

References Cited