Spawning the Goldspotted Killifish, *Floridichthys carpio* (Günther 1866)

Anthony C. Terceira
253 Central Pike, Scituate, RI 02587
terceira@ride.ri.net

As many times as I have been collecting native fishes, I still get excited at every opportunity. While visiting the Suncoast Killifish Society and my good friend Charlie Nunziata in September 2005, I had the chance to spend time collecting many of the wonderful native fishes of Florida.

One of my goals on this trip was to collect in Tampa Bay, in the shadows of the Skyway Bridge (Fig. 1a). My hopes were high as Charlie and I met up with Brian Skidmore, Mike Jacobs, Bill Shields and his son Andrew, Christina Cockrell, and Dr. Harry Specht, many whom are members of NANFA and the Suncoast Killifish Society. Tampa Bay fishes of interest to hobbyists include Gulf killifish, *Fundulus grandis*; longnose killifish, *F. similis*; diamond killifish, *Adinia xenica*; sheepshead minnow, *Cyprinodon variegatus*; rainwater killifish, *Lucania parva*; sailfin molly, *Poecilia latipinna*; eastern mosquitofish, *Gambusia holbrooki*; and goldspotted killifish, *Floridichthys carpio* (Skidmore et al., 2001). I was particularly interested in *A. xenica*, *L. parva* and *F. carpio*. But if there's one thing you can be sure of when collecting fish, it's that the fishes you can get at any given site change from visit to visit.

We arrived on a wonderful September afternoon at low tide. Only small shallow pools remained within the first 100 yards. Nevertheless, we were able to seine some of these shallow pools and, amongst the vegetation, caught some young *F. grandis*, *L. parva* and *F. carpio*. Regrettably, we did not find *A. xenica*, but that only serves as an incentive to return again.

In Günther's 1866 original description of *F. carpio*, he noted the type locality as "America." We know today that the fish is found along the Atlantic and Gulf coasts of Florida (including the Keys), Alabama, Mississippi and Louisiana. The species is primarily marine, usually in tidal flats and creeks, but it also enters brackish water. *Cyprinodon mydrus* Goode & Bean 1882 is a synonym (Huber, 2000). In most literature dating from the 1800s and early 1900s, the name *Cyprinodon carpio* is used, since that's the name used by Günther in his description (Lazara, 2001).

In nature, reproduction is seasonal. *F. carpio* become sexually active in March or April (depending on water temperature) and continue until September or October (Wildekamp, 1996). Goldstein et al. (2000) indicate that wild fish feed on young inshore fishes, grass shrimp, amphipods and other crustaceans, and algae.

I maintained a small breeding colony of 10 young adult fish in a 20-gallon long aquarium. Although *F. carpio* will adapt to a lower concentration of salt, I maintained them in a true marine environment using a commercial marine salt at a specific gravity of 1.020. The temperature was 74°F. I was concerned about the temperature because the water they were collected from was in the mid-80s. However, within a few weeks the fish had settled down and were eating live adult and baby brine shrimp, frozen adult brine shrimp, and *Mysis*. I supplemented their feedings with a spirulina-based flake food. The tank received 12 hours of light a day from overhead daylight fluorescent lamps.

Since *F. carpio* are active fish that love to spar, I provided hiding and resting places in the form of flower pots, plastic PVC pipes and rocks. At one end of the tank I placed a rather large spawning mop. In spite of their reported seasonal spawning in the wild, I found a significant number of eggs in the mop in November and December. The dominant male tended to guard territory above the mop while waiting for females to enter. Although the males chase each other, none were being picked on to a degree that necessitated my removing them

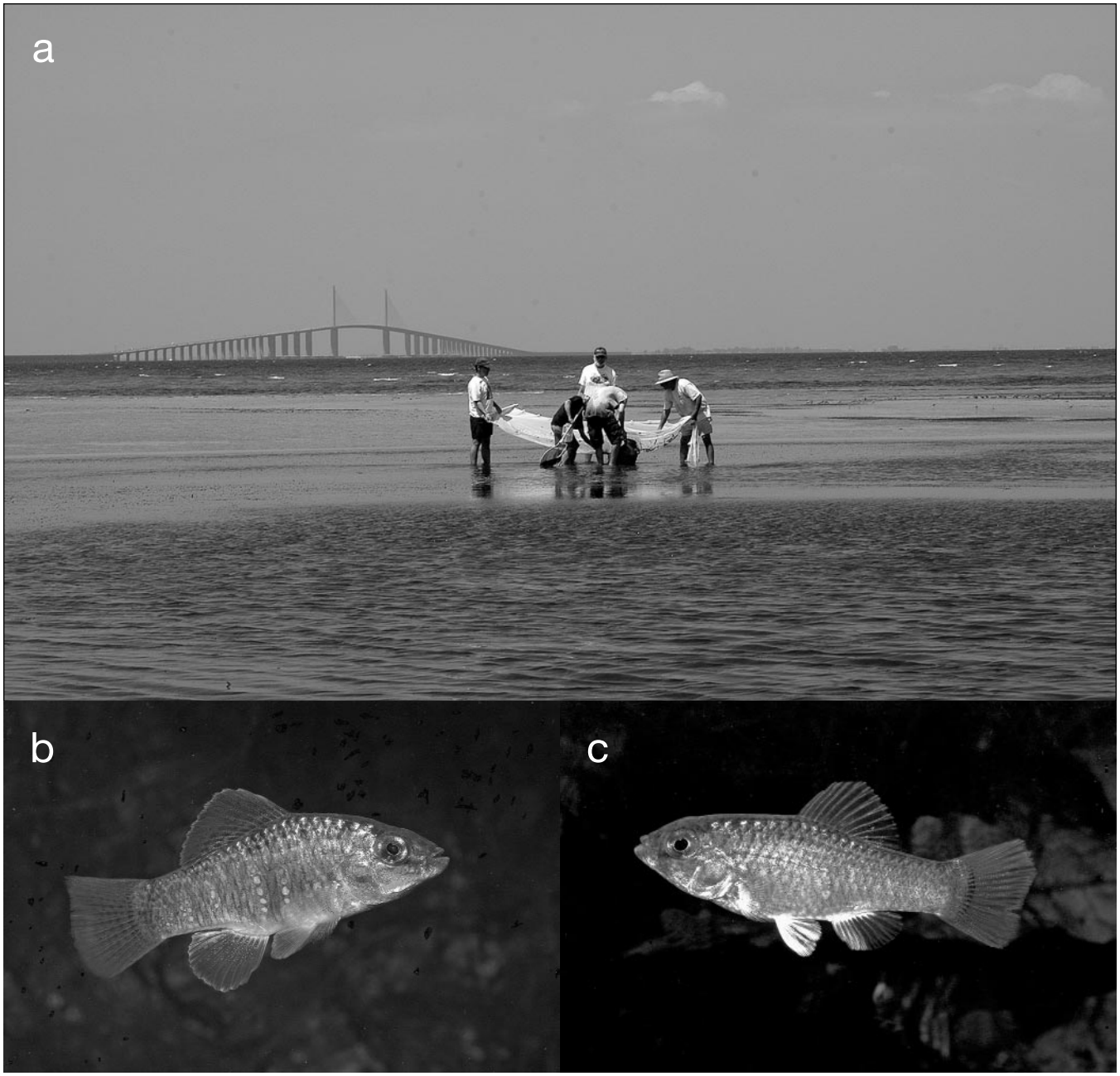

Fig. 1.
(a) Tampa Bay near Skyway Bridge, collecting locality for the *Floridichthys carpio* that were spawned by the author; photograph by Christina Cockrell. (b) Male and (c) female *F. carpio*; photographs by the author.

from the tank. Because males continue their territorial behavior after spawning, some think that parental care of the eggs may be involved (Wildekamp, 1996). I observed territorial behavior, but I'm not sure whether I would describe it as parental care.

I collected the eggs and placed them in a small margarine container where they hatched approximately 14 days later. Just about every egg I collected from the container resulted in a fry. Very few eggs developed a fungus despite the fact that I did not use a fungus inhibitor or dye. I kept the eggs at a relatively constant 74°F. The eggs are approximately 1 mm in diameter (Fig. 2). Although Goldstein et al. (2000) report that the eggs are clear, I would say they exhibit a slight gold cast. In either case, they are not highly colored eggs by any stretch of the imagination.

Upon hatching the eggs, I moved the fry to a plastic

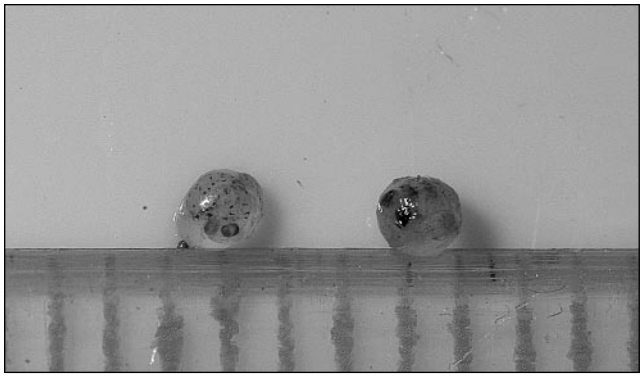

Fig. 2.
Eggs of *Floridichthys carpio,* approximately 1 mm in diameter.
Photograph by the author.

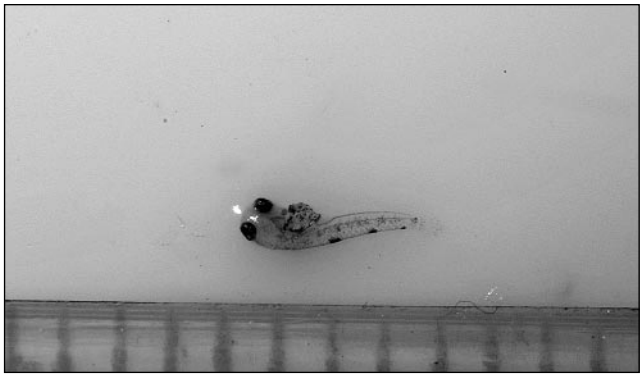

Fig. 3.
Eggs of *Floridichthys carpio,* approximately 4 mm TL.
Photograph by the author.

shoebox containing a small spring of Java moss. (I removed the Java moss after about a week.) The fry (Fig. 3) are approximately 4 mm in total length upon hatching and are able to take newly hatched brine shrimp provided it is one of the smaller varieties (e.g., San Francisco Bay Brand® or one of the other mini-brine shrimp eggs available). Within 4-5 days the fry are large enough to consume Utah baby brine shrimp.

An interesting thing I observed with my newly-hatched *F. carpio* fry is that they remained at the bottom of the container or shoebox for the first few weeks. They do not spend time swimming at the different levels in the water column. More than once I thought the fry had died because they kept so still on the bottom. Because of this, be very careful during partial water changes as the fry can easily be siphoned up along with uneaten food. The fish are slow growing, taking seven months to reach sexual maturity.

Floridichthys carpio, the goldspotted killifish, is just one of the exciting native killifishes that suffer from the fact that they do not come from some exotic Old World locale. They are colorful, hardy and easy to maintain. These characteristics make them an ideal fish for the home aquarium.

Literature Cited

Goldstein, R. H., Harper, R. W. and Edwards, R. 2000. *American aquarium fishes*. College Station, Tx.: Texas A & M University Press.

Günther, A. 1866. Catalogue of the Physostomi, containing the families Salmonidae, Percopsidae, Galaxidae, Mormyridae, Gymnarchidae, Esocidae, Umbridae, Scombresocidae, Cyprinodontidae, in the collection of the British Museum. *Catalogue of Fishes in the British Museum* 6: 1-368.

Huber, J. H. 2000. *Killi-Data 2000. Updated checklist of taxonomic names, collecting localities and bibliographic references of oviparous cyprinodont fishes (Cyprinodontiformes)*. Paris: Société Française d'Ichtyologie.

Lazara, K. J. 2001. *The killifishes: an annotated checklist, synonymy and bibliography of Recent oviparous cyprinodontiform fishes*. Killifish Master Index (4th ed.). American Killifish Association: 1-624. [Cover date is 2000, published in 2001]

Skidmore, B., C. Nunziata, H. DeBruyn, B. Kemker, C. Watson, and M. Jacobs. 2001. *Florida collecting guide*. 2nd ed. Tampa: Suncoast Killifish Society.

Wildekamp, R. H. 1996. *A world of killies: atlas of the oviparous cyprinodontiform fishes of the world*. Vol. III. Mishawaka, In.: American Killifish Association.

Web Sites

Huber, J. H. 2001. Killi-Data Online: http://www.killi-data.org

http://www.fishbase.org/Summary/SpeciesSummary.php?id=3184

NANFA membership directory

A directory of NANFA members is available in two formats: a hard-copy version that will be mailed to you upon request, or a PDF file that you receive via e-mail (requires Adobe Acrobat reader). The directory includes addresses and phone numbers, and is cross-referenced by state for easy identification of fellow NANFA members close to where you live and collect. For a copy, contact: C. Scharpf, 1107 Argonne Dr., Baltimore, MD 21218, ichthos@comcast.net.

goldspotted killifish

Floridichthys carpio (Günther 1866)
Family: Cyprinodontidae

Photograph by Anthony C. Terceira.