ICTALURID CATFISHES OF THE UNITED STATES

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Introduction

Freshwater, marine coastal areas and even some coral reefs harbor fishes known as catfishes. Greenwood, et. al. (1966) recognized 31 families, including about 2,000 species in the order Siluriformes (the catfishes). Although most species occur in freshwater, a few are marine, including the species of the family Plotosidae in the Indo-Pacific region, and species of the family Ariidae of the Atlantic coast of the United States. The two Ariid catfishes found along the U.S. Atlantic and Gulf coasts are Arius felis, the sea cat, and Bagre marinus, the gafftop or sail cat. Both swim into freshwater rivers. These species incubate their eggs orally!

The remaining catfish families are freshwater groups, with individual species only incidentally inhabiting bays or river mouths. Of these families only the family Ictaluridae occurs in the U.S., and is not found naturally outside of the U.S. and Mexico. The famous Walking Catfish of Florida is an introduced species of the family Clariidae and will not be considered in this article.

Five genera of catfishes comprise the Ictaluridae of the U.S.: Noturus, Ictalurus, Pylodictis, Satan, and Trogloglanis. The last three contain but one known species each. Noturus (Schibeodes of some authors, see Blair et. al.), the largest genus, contains in excess of 23 species (new species are still being found). The genus Ictalurus in the U.S. contains at least 11 species and includes the best known (by fishermen and hobbyists) North American Catfishes (bullheads and channel cats). Another genus, Prietella occurs in Mexico (1 species).

The Ictalurid catfishes occur naturally in most freshwater environments east of the Rocky Mountains, and some species have been introduced on the Pacific side. Individual species tend to inhabit either fast flowing streams, or sluggish areas of rivers and streams. Due to the presence of barbels (8 in all; 4 in the chin, 1 near the angle of the jaws, and 1 in association with each nostril), catfishes are well adapted to dark or turbid waters where light penetration for sight is minimal. The barbels allow for a keen sense of touch (tactile sense) and contain chemosensory cells (for taste or smell). Most species of North American Catfishes are probably nocturnal (active at night). Catfishes tend to be omniverous, eating such things as crayfish, other fish, aquatic insects, worms, snails, and a variety of food items. The Ictalurid catfishes lack scales, a trait not common to all catfishes.

Generic Account

1. Genus Notorus, with but a few exceptions the madtom catfishes, are relatively small, stream dwelling species which prefer fast flowing, rock or pebble bottom streams. A few, such as Notorus gyrinus, are swamp and pond dwellers. The largest species, Noturus

flavis, probably reaches a standard length of 250 mm. The maximum size of most other species is probably less than half of that. The mad toms are best known for the painful sting that they can inflict with their pectoral spines. A venom gland at the base of the spines is thought to discharge its contents which then flow over the surface of the spine.

Reproductive habits of species of the genus Noturus are not well known. The few observations that have been made indicate that a single male and female construct a nest (clear an area of debris) near rocks or some other protective objects. Apparently less than 100 eggs are laid, and these are guarded by the parents. The larger Noturus flavis is known to produce more eggs (perhaps 500 to 1,000). The reader is referred to Breder and Rosen (1966) for details of catfish reproduction.

Most species of Noturus occur in tributaries (eastern and western) of the Mississippi River and the Great Lakes. Mad toms can be found from the Rockies eastward to the Atlantic coast, and from Canada southward to the Gulf coast from Texas to Florida. Anyone in the U.S. east of the Rockies should have access to a local stream with at least one species of mad tom. Some species have very restricted distributions and may be rare. Others such as Noturus gyrinus (Great Lakes to the Gulf of Mexico; both sides of Appalachian Mountains) and N. miurus (Great Lakes to the Gulf of Mexico) are widespread and common.

The Noturus, being small and territorial, can be interesting aquarium fishes. They may be aggresive, however, and active at night. Most species are not attractive, but some, such as N. hildebrandi (lower Mississippi valley) and N. miurus are yellow with dark dorsal saddles, and are easily as attractive as many "exotic" catfishes maintained by aquarists.

The genus Noturus can be distinguished from other U.S. catfish genera by the adnate adipose fin, (that is, a low fin continuous with the caudal fin). A blind cave catfish, Prietella phreatophile, from Mexico, also has an adnate adipose fin, is related to Noturus, and probably was derived from Noturus at a time when the latter genus existed in Mexico (last ice age). The reader is referred to Taylor (1969) for a detailed discussion of the Genus Noturus.

2. Genus Pylodictis: only one species, Pylodictis olivaris, the Flathead catfish is placed in this genus. This is one of the largest U.S. catfishes, reaching a weight of 100 pounds. This species inhabits streams, large rivers, and reservoirs throughout the Ohio and Mississippi valley, southward to the Gulf coast, and westward to the Rio Grande river. It is a good food fish. Little is known of its reproductive habits.

3. Genus Satan: This is also a monotypic genus, the only species being Satan eurystomus, a blind, unpigmented species (like Prietella) known only from artesian wells near San Antonio, Texas. This species is apparently most closely related to Pylodictis, but only attains a length of about 2 inches! Nothing is known of its be-

havior or ecology. It lacks an air bladder, a trait shared with only one other U.S. catfish, Trogloglanis pattersoni, another subterranean species (discussed below).

4. Genus Ictalurus: The genus Ictalurus contains the largest North American catfishes. The genus itself contains two somewhat distinct types of catfishes, the channel catfishes and the bullheads, although one or two species are not clearly one or the other. The basic distinction between channel cats and bullheads is that channel cats have a markedly forked tail whereas bullheads have a "squared" tail or a slightly emarginate (forked) tail. In addition, there are some differences in the skull and other osteological features. In general, channel catfishes inhabit large rivers, while bullheads inhabit smaller streams, ponds, lakes and swamps. There are some exceptions, however. Two species, Ictalurus catus and I. serracanthus are in-between channel cats and bullheads with respect to anatomy and ecology. Catfishes of this genus also have sharp pectoral spines and associated glands.

The channel catfish category includes two well known, widespread, and widely introduced species, the channel catfish, I. punctatus, and the blue catfish, I. furcatus. The latter is the largest U.S. catfish, weighing in excess of 150 pounds. Both are found in the big rivers and reservoirs of the Mississippi and Ohio valleys. The channel cat also occurs on the Atlantic slope of the Appalachians southward to Lake Okeechobee in Florida. The blue cat ranges westward into Mexico. Western species related to I. punctatus occur in New Mexico and Arizona. Western and Mexican "channel catfish," and like populations probably need a taxonomic revision. The channel cats are excellent food fish, and are fished for as sport and commercial fishes.

The bullheads include several wide ranging species, notably Ictalurus nebulous, the brown bullhead, and I. natalis, the yellow bullhead. Both occur from the Great Plains to the Atlantic coast, from Canada to the Gulf of Mexico, and throughout Florida. Both have been introduced west of the Rocky mountains. They occur in a wide variety of habitats: springs, rivers, swamps, ditches, lakes, and ponds. They are commonly caught on hook and line and are good food fish. Ictalurus nebulosus may attain a weight of 3 or 4 pounds; the yellow bullhead is a little smaller. A similarly widespread bullhead is I. melar, the black bullhead, which ranges from the Great Lakes to the Gulf of Mexico through the Mississippi valley. It lives in small streams and ponds. A small related form is a river dwelling species of the Atlantic coast, I. platycephalus. The latter name once included two other species now recognized as being distinct species, I. serracanthus from the from the Suwanne, Ochlockmee and Apalachicola rivers of Florida. Ictalurus brunneus, curiously is also found disjunctly in the Appalachicola rivers on the Gulf coast of Florida (Yerger and Relyea, 1968). Ictalurus serrecanthus and I. brunneus are small species (to 150 mm) characteristic of rocky or limestone bottom streams and springs. Both are snail eaters. The white catfish, I. catus and I. serracanthus seem to bridge the gap

between bullheads and channel cats. The white catfish often inhabits low salinity areas around the mouths of rivers.

Reproductive activities of Ictalurus are probably similar to those of Noturus, with nest building and guarding of young being typical (see Breder and Rosen). Maintenance of adult Ictalurus in aquaria is difficult due to their large size, but if one has large aquaria available these species adapt well. Juveniles make good, although often aggressive, aquarium fish. Most species of Ictalurus are drabily pigmented. The most pleasing species in this sense are young channel catfish which are silver with black spots (similar to some of the Pimelodellid catfishes popular with aquarists), and I. serracanthus which is black with distinct cream colored spots. The latter makes a fine aquarium fish.

5. Genus Trogloglanis: Trogloglanis pattersoni is another blind, unpigmented cave catfish from artesian wells near San Antonio, Texas. Like Satan, it lacks an air bladder. Nothing is known of the behavior or ecology of this species. It appears to be related to species of the genus Ictalurus. The reader is reffered to an article by Suttkus (1961) for a discussion of Trogloglanis, Satan, and Prietella.

Some general concluding comments on catfishes seem appropriate. Amazing anatomical and ecological diversity mark the Siluriform Fishes. This group of fishes is surely one of the most successful types of vertebrate animals in freshwater. The U.S. catfish fauna, while displaying far less diversity than catfishes do on a world wide basis, nevertheless exhibits extremes of size, and some unusual living conditions (subterranean areas). Ictalurid catfishes are generally regarded as a significant segment of our North American wildlife, with both commercial and recreational importance.