

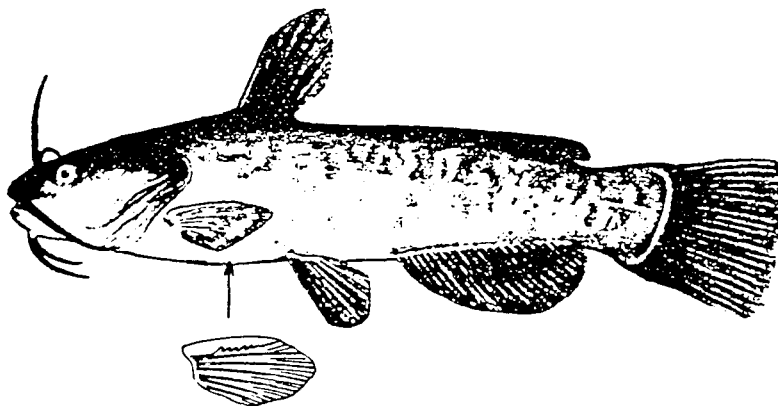
The Behavior of North American Freshwater Fishes

II. The Behavior of Catfishes by Antonios Pappantoniou

To the passive observer it would seem that fish go about their daily business without much interaction or communication. Over the past thirty or so years the communicatory ability of fish has been under investigation by scientists all over the world. What they have learned is quite amazing. Not only are some species of fish able to communicate by visual and vocal means, but also by more subtle means such as chemicals.

Chemical communication has been studied in certain catfish of the genus *Ictalurus*, namely the yellow bullhead, *I. natalis* and the brown bullhead, *I. nebulosis*.

BROWN BULLHEAD
Ictalurus nebulosus



DISTINGUISHING CHARACTERISTICS

Back more or less dark brown, belly gray to yellowish; sides and back often mottled. Pectoral spine strongly barbed on rear edge; offers resistance when grasped by thumb and forefinger. Tail squarish; not deeply forked. Gill rakers 11 to 14 on first arch.

As I look at the solitary bullhead in my own aquarium, swimming back and forth, I find it quite astonishing to think that under proper conditions, this individual could display a wide variety of social behaviors. The behavior of bullhead catfish is dominated by two sensory systems, smell and taste. Although they have eyes, vision plays a small role in their behavior. Even animals that have been experimentally blinded interact with each other in a normal fashion.

Taste is the sense that allows catfish to find their way to a food source. The body of the bullhead is literally covered with taste buds. There is an especially dense concentration in the barbels. Experiments done by Bardach et al. (1967) indicate that catfish can follow a chemical gradient right to its source. They do this by comparing concentrations of the chemical, and follow this right to the source of emanation.

Smell plays a critical role in the social behavior of catfish. Smell allows bullheads to not only recognize members of their own species, but individuals as well.

Catfish commonly establish a territory. This occurs in nature and in aquaria. When two bullheads live in the same aquarium, each will establish a territory. They will generally not cross the boundaries of each other's territories.

In a tank with several individuals a hierarchy is established. The dominant individual establishes the largest and best protected territory. The lower the status of the individual the smaller and more exposed its territory.

Agonistic activity in bullheads can run from mild threat displays to violent conflict, depending on the individuals involved in the aggressive activities. Todd (1971) describes several different forms of agonistic behavior and the conditions under which they might arise.

Agonistic behavior between equals of the same community is generally mild. It does not involve much physical contact. Most of it is in the form of ritualized displays.

Aggressive behavior between dominant and subordinate individuals usually ends up with flight of the subordinate and pursuit by the dominant individual.

A rivalry between strangers causes the most violent conflicts. Biting is common and occasionally combatants will fight to the death. In some instances, loss of a battle will lead to the stunting of the growth of the loser (Todd, 1968).

By now you may have the impression that bullheads are scrappy fish which do nothing but defend territories and fight with each other. There is another side to their behavior, which is much more cooperative.

Todd (1971) describes the cooperative behavior among bullheads. When a strange catfish is put into an aquarium with a small catfish community, the subordinates will swim into the territory of the dominant individual and climb on his back for protection. The dominant individual will then swim out and engage the stranger. When he defeats the stranger he then chases out the subordinates from his territory.

In nature, catfish are often found in dense aggregations. Under such conditions they seem to display no aggression or territoriality. How are their normally territorial and aggressive habits suppressed? It seems that catfish in large aggregations emit a chemical which reduces their agonistic tendencies.
