Can Fish Smell Underwater?

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(Photo by Joe McFarland.)

From stinky baits to lure sprays, fishermen for ages have assumed fish can smell. Is there any supporting science?

On the surface, the notion of fish being able to smell underwater just doesn't make sense. From a human perspective, detecting aromas while submerged in water is literally impossible. We breathe air, not water. But what about fish—those full-time water inhabitants that breathe by absorbing oxygen through water? And why do fish appear to have nostrils if they actually breathe through gills?

Are those "nostrils" connected to olfactory smelling senses?

The idea that fish can smell is a basic assumption by many sportsmen. Fishermen everywhere dunk their lures in secret potions and use rotted, even fermented, concoctions to attract species of catfish and carp, all under the assumption fish can somehow smell the bait.

But can fish really smell?

"Yes, fish can smell," proclaims Brooks Burr, a fish biologist at Southern Illinois University at Carbondale. Those little nostrils we see on the snout of fish do, indeed, connect to internal chambers that are equipped with folds of sensory tissue. Those receptors detect everything from sex hormones to trace amounts of blood in the water.

Ever wonder why fish appear to have nostrils? Since fish "breathe" through their mouth and gills, what good are those tiny holes in the snout?

"It has been demonstrated that fish can detect certain smells down to just a few molecules in the water," Burr added.

What does this mean for fishermen?

Department of Natural Resources fish biologist Alan Brandenburg, manager at Little Grassy Fish Hatchery in Williamson County, said it's helpful to understand how different species of fish utilize their sense of smell and taste. Some species rely heavily on smell and taste while others don't. Some species—such as European carp and various catfish—rely heavily on those

(Photo by Joe McFarland.)

Does adding a little flavor to artificial baits (left) attract more fish? Catfish anglers have long believed that strong flavors can be detected by specialized sensory "whiskers" (above).

interconnected senses while other species—such as panfish and bass—feed primarily through visual triggers.

"A lot of fish will grab and taste something before deciding whether to spit it out or swallow it," Brandenburg said. "But not always. Look at a plastic lure. It doesn't taste or smell like anything a fish would ever want to eat, yet fish strike artificial lures all of the time. It's a visual response thing."

To demonstrate how some fish ignore their sense of smell or taste, Brandenburg once rigged a "lure" from a piece of plastic he found in the trash. The plastic cigar holder he found had zero potential as live bait. Yet when Brandenburg added a hook and twitched it through the water, he caught a fish.

Visual cues or triggers are both learned and instinctive feeding behaviors. The splash of insects falling into a pond is quickly associated with food. Of course, as with the junk plastic lure, the splash doesn't always represent actual food.

At Devil's Kitchen Lake at Crab Orchard National Wildlife Refuge, stocked rainbow trout appear to gobble anything that floats down into the water, possibly a learned response from previously being fed food pellets at a hatchery. Retired DNR biologist Jared Garver—an avid trout fisherman—always investigates the stomach contents of trout he cleans after fishing at the exceptionally clean lake.

Garver's curiosity about rainbow trout feeding behavior led to an interesting discovery.

"Throughout one season I found three cigarette butts, two plastic worms, four sticks, a piece of gum and a plastic minnow in the stomachs of trout," Garver reports. "Devil's Kitchen is such a clean lake, it makes me think the trout will eat any unusual object they see floating in the water.

"It also makes me think trout aren't nearly as smart as fishermen think they are," he laughed.

So, how important is smell among the various senses fish use before deciding to bite? For some species, it matters greatly. Therefore, the use of "stinkbait" for catfish or flavored corn pellets for carp is clearly a good choice for anglers wanting to attract those species that rely on smell and taste.

Even for species with good eyesight (the "sight feeders"), an added bit of flavor doesn't seem to hurt.

During a major bass tournament on Rend Lake several years ago, this writer shared a boat with TV pro angler Hank Parker as he squirted a bit of scent on a plastic worm before casting into a likely bass hangout. Action had been slow, Parker pointed out, and a spritz of his secret potion might improve the odds.

Within a few casts, Parker hooked and boated a bass. Yet, after several more minutes and many unproductive casts, he abandoned the spray and changed lures.

There also is the impossible-to-quantify influences of random coincidence, as well as the psychological boost of adding flavor to a lure that causes anglers to sharpen their focus and catch more fish.

For anglers, simply knowing that fish can and do smell clearly leads to a more productive fishing experience. The question remains: What smells attract fish?

Wouldn't we all like to know?

Carp and trout anglers maintain that kernels of corn are good bait—but flavored corn soaked in everything from strawberry juice to butterscotch works even better.