

## DO FISH DRINK? by Dan Kosta

A while back, a non-fish-keeping friend asked me, "Do fish drink." I told him, "I would guess so, but I'm really not sure." We let it go at that but later I became curious about it. After some research into the matter I realized there really isn't much information on the topic. A college biology text contained the best information of anything and I will try to present basically what it said to you in as non-scientific a manner as possible.

Fresh water fishes, in order to maintain the proper cellular existence, cannot have their body fluids as dilute as their fresh water medium. Due to this fact, they must take in salts while losing water. This condition is called hyperosmotic.

Because the fresh water fish is hyperosmotic, there is a steady movement of the water in the organism across the membrane of the gills and mouth, and a constant loss of salts across the same membrane. With this situation, there is no need to drink as this would only cause a higher amount of water entering the fish's body.

The fish solves the problem of an over-abundance of water in itself in two ways: through the elimination of excess water by the kidneys and through the taking in of salts by specialized cells in the gills.

The marine fishes have just the opposite problem. They constantly lose water to the environment and are in constant danger of dehydration. Thus the marine fishes are hypoosmotic, and they have the problem of excessive water loss and excessive salt intake. To compensate for this, they drink almost constantly and actively excrete salts, in very concentrated form, through specialized cells in the gills.

So, as you can see, whether or not a fish actually drinks is simply a matter of its environment. Fresh water fish almost never do, while marine fishes drink almost continuously.

### Reference:

Keeton, William T., Elements of Biological Science, New York, W. W. Norton and Co., 1969