

ANGRY FISH / ANGRY ENVIRONMENTALISTS

BY E.M. FAY



Judging by the ever-growing number of anti-depression and anti-anxiety medications advertised these days, we humans are a neurotic bunch. So extreme is our apparent need for psychotropic drugs that many users routinely ignore the formidable list of side effects warnings that accompany the pills.

While it may be our right to risk various potential harm to our own bodies by ingesting quantities of chemicals, their final destination is the watery home of numerous species, upon whom our excreted drugs are having an extremely negative impact.

In the case of fish living in the waterways where drug residues end up, toxicologists are concerned in particular about psychiatric or “psychotropic” drugs because they influence parts of the brain that are common to humans and other animals. Living in water containing psychotropic drugs affects fish behavior in ways that can threaten their existence, for example, by slowing their reaction time and decreasing self-protective mechanisms. Some behavioral changes can even affect the entire eco-system that fish and other animals share.

It has long been acknowledged that fish ingest many pharmaceuticals, partly through human excretion and partly because people often flush unwanted pills down the toilet. Time magazine has written about this topic in their February 15 Science section. <http://tinyurl.com/ajv4ayg>

To quote from Time, “If [a chemical] doesn’t kill animals outright or prevent them from reproducing—as DDT did by causing birds to lay thin-shelled eggs— it’s not considered a clear and present threat.”

In a recent study, researchers from Umea University in Sweden tested perch who lived in a river downstream from a wastewater plant. (Science magazine, Feb 2013) Evidence of the psychotropic drug oxazepam was specifically targeted, as that is a widely distributed member of the benzodiazepine “family.” Benzodiazepines are the most frequently prescribed anti-anxiety medicines.

Comparisons were made between fish in contaminated water and clean water. Three groups were set up: one in a tank of clean water, one in water with the same concentration of oxazepam as in the river, and one in water with 500 times the river’s concentration. Dr. Tomas Brodin, Assistant Professor of Ecology and an author of the study, said, “We looked at just one benzodiazepine-type drug but there are many others out there, and they probably all have the same effects on fish and other vertebrates. So we may be underestimating what is happening in nature.”

After a week, the fish in clean water showed no change in behaviors. Those in the water with the lower level of oxazepam were significantly less social, ate their food much faster than normal, and were more aggressive than the first group. The fish exposed to the higher level of oxazepam were affected even more strongly, especially regarding boldness.

These altered behaviors would likely lower the perch’s survival rate, as sociability, i.e., schooling activity, and avoidance techniques were lessened, which would mean easier predation by other species.

Dr. Brodin noted that the behavioral changes seen in the laboratory subjects could have unexpected evolutionary and ecological consequences if reflected in wild populations. Although it will be difficult to

document exact consequences of these altered behaviors, scientists acknowledge that they are bound to occur.

Dr. Brodin suggested figuring out safer ways to neutralize the chemicals as they go through sewage filtering facilities. Stricter guidelines for drug trials could identify those drugs that have smaller ecological impacts.

If the article above is not sufficient to give you pause with regard to eating fish, then please consider that commercial fishing drowns at least 600,000 seabirds annually, and that could be an underestimate.

That number does not include seaturtles, seals and even whales.

For more information, please visit:

www.nytimes.com/2013/06/13/us/study-finds-large-seabird-toll-from-fishing-nets.html