O_2 TABS
DO THEY REALLY WORK?

Konrad Schmidt

Why use O_2 tabs? For many years, I have been intrigued with the simple concept of "popping a pill" into a live well or bait pail to boost dissolved oxygen when transporting fish. If this truly is effective it would eliminate the paraphernalia required for DC pumps or compressed oxygen tanks (i.e., batteries, inverters, regulators, air stones, and tubing). In recent years, this idea has moved to my front burner now that I collect and transport sensitive species for re-introduction to high quality urban lakes (Schmidt, 2014). Another potential use came to mind for mailing fish, but I assumed if oxygen is being emitted the sealed bags would soon burst from the increasing pressure.

How do O_2 tabs work?

The makers of Pemble-Halverson OTABs claim their product will keep bait fish, shrimp, crayfish, and tropical fish alive for hours by releasing bubbles of 90 percent oxygen and 10 percent carbon dioxide. One tab will keep three dozen medium shrimp or bait fish alive for five hours. They work in fresh or salt water, do not dissolve or contaminate water, have an unlimited shelf life if stored in a cool, dry place, and are "eco-friendly." However, they do cite a couple of caveats. Colder water temperatures hold higher concentrations of dissolved oxygen and OTABs may become ineffective above 75° F. Bait fish held in water volumes of a pint or less should be added after the initial cloud of bubbles are released. Otherwise, bubbles may stick to the gills and won't be dislodged by swimming in a confined space.

What types of O_2 tabs are available on the market?

Besides boosting dissolved oxygen, many products also claim their tabs can protect a fish's protective slime coat, which prevents disease from stress and injury, can sedate fish during transport, and can reduce ammonia. OTABs have been on the market for 75 years and are available in fishing and bait stores. Other products intended for use with bait are available via the Internet under brand names such as Frabill Aqua-Lung and Sure Life Bait-Buddies. Aquarium trade brands include JBL, Supa, and Tom. Jungle Labs no longer sell Bag Buddies for shipping fish, but these still occasionally show up at very inflated prices on eBay.

How were O_2 tabs tested?

I ran two trials. The first test used identical Glad storage containers with the same volume of water at 62° F in each. The second trial used identical sealed plastic bags holding equal volumes of water. The bags were also marked an equal distance from the bottom edge with a permanent marker in order to seal roughly the same amount of air in each. Both trials had one control without tabs. However, one additional bag was filled with compressed oxygen. Five minnows purchased from a local bait store were put in each container and each bag. I might have been guilty of injecting a little bias into the study when making the species selection. I wanted to avoid using Fathead Minnows (*Pimephales promelas*), which have been the species of choice in ad infinitum research assay trials. I always wondered why one of the most tolerant species in North America became the gilled guinea pig to test for sensitivity to chemical substances. The bait store carried "Rainbow Chubs," or Finescale Dace (*Chrosomus neogaeus*), and I purchased enough for the two trials. When I arrived home, however, I found the bait pail held about half Finescales and half Fatheads. This was a pesky variable I had not anticipated, so I modified the design to a 3:2 ratio of Finescales to Fatheads in each container and bag. Even though all looked healthy and frisky I also had concerns about how

Figure 1. The products tested and compared.

All photos by the author.

Figure 2. Trial 1 (top): Notice early mortality in control container. Trial 2 (bottom).

much stress these fish had endured from trapping, transportation, and care under crowded conditions before sale. Trial 1 ran for 12 hours, which is much longer than the 3–4 hour transit time from my donor to recipient lakes. Trial 2 was designed for shipping fish and continued into the fifth day. All containers and bags were checked hourly (except when I was sleeping). In the first trial, individual fish were removed at the first sign of listing or mortality, but in the second trial the entire bag of fish was eliminated from the study.

How did the O_2 tabs rank?

In the first trial one fish went belly up in the control container at three hours and a second at five. Supa lost one at four hours. Frabill Aqua-Lung lasted eight hours until the first loss and another three fish succumbed at 12. Tom, JBL, Sure Life, and OTABs kept all fish alive and right-side-up through the 12-hour trial. Hind sight is 20-20; I now regret that I did not extend this trial on the latter four products to at least 24 hours. However, it does appear these are effective for transporting fish for at least 12 hours. I quickly

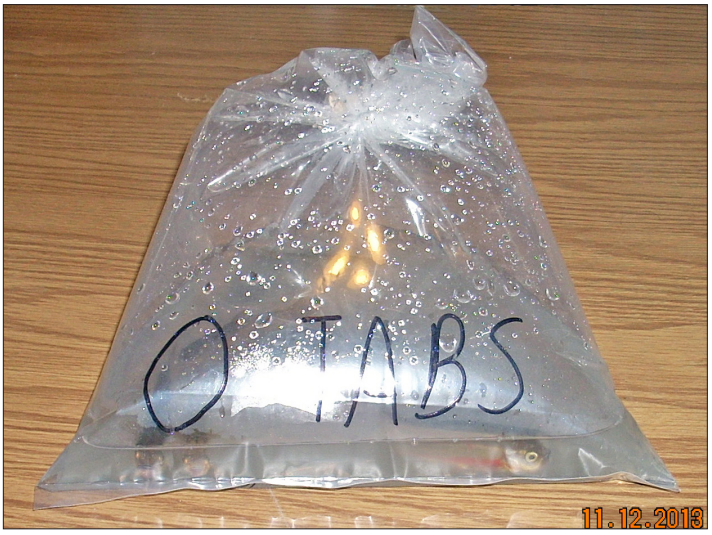

Figure 3. OTABs—the winner by a long shot.

found in the second trial my concern about bursting bags was unfounded. The first casualty occurred in the Supa bag at three hours. The control bag was eliminated at five hours and both the Frabill and Sure Life were out at eight. I was surprised (and a little disappointed) that the bag filled with oxygen only lasted 13 hours. Fish started listing in the JBL bag at 25 hours and Tom lasted 38. This left only the OTAB bag, in which all the fish appeared healthy and showed no signs of stress. I was amazed—and puzzled—at how clear the water remained into the third and fourth days. Not until 132 hours (5.5 days) was one fish listing. Based on these results, Tom tabs should work for 24-hour guaranteed shipping, but OTABs could work for (much cheaper) standard shipping, provided the fish are not mailed before or during a heat wave. However, I must acknowledge that wholesale and retail suppliers of both native and tropical fishes routinely ship quite successfully with no or minimal losses. So, are tabs essential for shipping fish? The answer is no, but using Tom or OTABs may provide added assurance (and peace of mind) that they will arrive alive.

What's the bottom line?

Pemble-Halverson OTABs stood way out among the competitors, but are not cheap. Amazon sells two per card for $4.49 (plus shipping on orders less than $35). Greater quantities have been available for less on eBay (http://stores.ebay.com/grapentinspecialties/). Six tabs listed for $7.99 with free shipping. The price for 36 was $29.00 and 72 cost $59.99 plus $5.50 shipping on both. Additional distributors are listed at the following link: http://www.otabs.com/location.html

Reference

Schmidt, K. P. 2014. Noah's Fish Ark. American Currents 39(1): 8–12. North American Native Fishes Association.