



De-Bugging Your H2O

By Jeff Randall

Having spent a lot of time in tropical bush I've learned that finding water is not a problem – making it safe to drink is. While I always preach that drinking questionable water in a true survival situation is much better than dying from dehydration, the consequences can still be ugly. The only time I ever suffered from Giardia came from drinking clear, cool water

directly from a jungle mountain stream many miles from any hint of civilization. After returning stateside and finishing out a dose of Flagil, I finally got rid of the nausea and diarrhea – all the while swearing I would never drink unpurified water again.

For our travels, the main reason we sometimes fail to filter water properly is due to the harshness of jungle environments and the “comfortable laziness” that often sets in after a week or so in the bush. While muddy water where I live will breeze through most purifiers, ceramic filters clog extremely fast in tropical “black water” (dark, clear water with enriched amounts of tannins and minute particulates from forest vegetation). We've tried just about every pump filter on the market, used all sorts of commercial and home made pre-filters and even carried chemical flocculants to try and solidify the particulates before filtering. Nothing has worked with any measurable success. Without fail, every filter would pump about a liter or two of good water then the filter would have to be broken down and cleaned of the thin, goeey brown slime left on the outside of the ceramic. Pump filters, to us, became nothing more than extra weight when hiking through miles of heavy forest. In fact, it became a regular joke to buy a new style filter and then “kill it” once we reached the first black water areas of our expedition. Once it became too much of a hassle to clean we would simply chance it and drink with our eyes closed. In between jungle trips we spent a lot of time talking with engineers and researchers trying to find a cure, but no one ever solved the problem.

So, during our last two expeditions to the Matses Indian region on the Peru /Brazil border we left the pump filters at home and used Iodine treatment instead. The problem with this is scientific studies have shown Iodine to be ineffective against *Cryptosporidium*, plus the treatment time to effectively kill Giardia cysts is considerably longer than the manufacturer recommends. If you don't double up the dose and wait long enough, then you will eventually get Giardia or some other nasty bug, so if you're going to carry Iodine then you might as well carry a dose of Flagil with you as well. There is also shelf life to consider when using chemicals, as well as some folks having Iodine sensitivity. Even if you get through these hurdles the amount of treated water is limited to the amount of chemicals you carry. In the end, I have never considered most chemicals a good form of treatment for survival kits that are to be stored for any length of time. Not

only due you have a shelf life issue, but all of the chemicals I have used are caustic to surrounding materials. Once you open a bottle of Iodine (tablet or liquid) it's best to throw away the remainder after you get back to safety. No matter how tight you close the lid the chemical will leech out in time and ruin anything and everything it comes in contact with.

Since our days of trying to find a cure for our water woes, two new products have come to the market. Both of these, in my opinion, are exceptional for the areas we haunt and travel and have earned their place in our "go bag" when it comes to remote locations.

MSR MIOX Purifier

The first is a handy device manufactured by MSR (Mountain Safety Research) called the MIOX purifier. The easiest way to explain it is it's basically a municipal water treatment plant reduced to a size that fits in your shirt pocket. It uses ordinary rock salt, a few drops of water and two CR123 batteries to create a small amount of mixed oxidant solution. This solution, when added to questionable water, will kill viruses and bacteria in



15 minutes, Giardia in 30 minutes and Cryptosporidium in 4 hours. The nice thing about the device is one ounce of salt and one set of batteries will purify 50 gallons of water. So, with nothing more than a few ounces of rock salt and some spare CR123's you could supply water to a large number of people for many days if need be. Once the salt chamber is loaded and the batteries inserted, the device instantly creates the oxidant solution at the push of a button. Each button push is calculated to the size of the water container you have (from ½ liter to 4 liters), so you could easily treat any container size from a small canteen to a 5 gallon jug. The device has "low salt" and "low battery" warning lights to keep the user informed of the status, and also comes with water test strips to verify the safety of the treated water.

After using it for several weeks, the only negatives I can find are: 1) it does create a slightly noticeable taste to the treated water (not a big deal to me), 2) it doesn't remove any particulate matter like filters do (again, no big deal – just close your eyes when you drink), and 3) you need a 4 hour wait time after treatment to remove cryptosporidium (U.S. Government reports also suggest increasing the dosage in highly questionable water). On the positive side its level of water safety, size, weight, and the fact that we always pack some form of salt and extra CR123 batteries make this unit a "must have" for our packs. Plus, once you return to the safety of a civilized setting, simply wash out the chambers of the MIOX, take the batteries out, and store it away. No mess and no worries of chemicals ruining your other survival gear. The retail kit contains the MIOX purifier, 1 ounce of rock salt, 2 ea. CR123 batteries, 50 test strips, instruction manual and storage sack. The purifier weighs 3.5 ounces and is constructed from high impact plastic. It also has a permanently attached safety lanyard

for the salt chamber and battery compartment caps. The MIOX will operate in temperatures ranging from 20-130 degrees Fahrenheit and is water resistant to 60 feet. Price: \$ 139.95

Katadyn Vario Water Filter

The next new item that caught our attention is the Katadyn Vario water filter. While it's still a pump filter, someone finally got it right when it comes to ease of use and cleaning.



In the past it's always been a chore to disassemble the filter, take out the cylindrical ceramic cartridge, clean all the way around and then reassemble. The Vario solves that problem by using a simple ceramic disc located at the top of the filter. Simply twist the filter head about 20 degrees and remove. The disc can then be popped out, wiped down and re-assembled in mere seconds. You can also bypass the ceramic filter and use only the 0.3 micron glass fiber / charcoal filter to purify up to 2 liters per minute depending on water quality. While this increases water flow considerably, it does cut down on the life span of the fiber filter. The complete filter (with ceramic disc) is rated at 500 gallon capacity before replacing the cartridge (depending on water condition). During my tests I found that the ceramic filter should always be used since it saves the glass fiber filter from collecting too much particulate matter. In fact, due to the ease of cleaning I can't think of a scenario that would require removing the ceramic filter stage, even in jungle

black water. With a clean ceramic disc I could easily pump a liter of water in a little over a minute from a pond on my farm. This fast rate not only comes from the filter design but the pump is dual action, pushing water on both the up and down stroke. I tried the filter in various types of water ranging from ponds and creeks to runoff water. In every case the water came out crystal clear with no particulate matter and good taste due to the replaceable carbon core. As previously stated, cleaning was quick and easy so this pump has definitely earned a spot on our next jungle expedition.



Another feature I really liked was its ability to fill water bladders as easily as bottles. The Vario's bottom cap has an outlet port designed to fit most of the popular hydration bladders. Simply remove the bite valve from the bladder and insert the tube into the bottom cap and start pumping. It will also screw directly on to a standard Nalgene bottle. The kit weighs about 15 ounces and comes with all hoses, extra housing O-rings,

cleaning pad, and weighted hose pre-filter. The Vario will remove waterborne bacteria, Giardia and Cryptosporidium cysts, while the carbon core reduces chemicals, pesticides and bad taste in questionable water. Price: \$ 79.99

My hat's off to both MSR and Katadyn for their new designs. In the past it seems most lightweight consumer water purification has been aimed at the weekend backpacker instead of long-term, lightweight expedition use. I feel certain both of these purifiers will keep your water supply safe in a long term, remote environment as well as short term survival situation. As far as choosing between the two, that's simply a subjective decision to be made by the consumer.

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Katadyn Vario Water Filter

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