Available colour

by David Colyn

The nutrient rich Benguela current that flows up the West coast of South Africa is a blessing to underwater photographers. It sustains invertebrate life with stunning colors and thus provides plenty of photo opportunities. However, these same cold nutrient rich waters can also be a curse to underwater photographers. When the wind and swell eventually dies down in this area which Portuguese explorers called the Cape of storms, you have a limited time of good 10 to 15 meter visibility before the sun produces an algae bloom which turns the clear blue water into green pea soup with visibility down to 2 meters or less. Even when the visibility is at the average 6 meters there are always enough particles in the water to absorb most of the ambient light, giving photos an emerald green tint and backscatter that resembles a sandstorm in a desert. This backscatter problem is so severe that it makes underwater photography with a compact camera and internal flash almost impossible. If you decided to wait for good diving days that have little swell, mild wind and 15 meter visibility your camera would be obsolete before you took a 100 photographs.

Like most I started my underwater photography with such a compact camera and relied on the camera flash only. The backscatter problem frustrated me so much that I ended up asking a local underwater photographer for advice. He taught me the secret to beat the backscatter problem and the day I added the Inon Z240 strobe to my 4megapixel compact camera it transformed the capability of my

(Above) First dive making use of strobe light as normal and the result is dull orange tentacles and a brown center.
(Right) This is the first image taken with the strobes turned OFF to serve as a before/after comparison. Had to add 1.83 f stops of light in Canon DPP and correct white balance with click white balance function

underwater photography equipment. I was now able to take decent macro photos even when visibility was down to 2 meters. As long as I aimed the strobe at the correct angle the backscatter was minor and the STTL mode automatically took care of the flash exposure. The strobe addition worked so well that I added a second strobe to fill in the shadows and by the time I upgraded to a DSLR I never even considered doing macro photography with ambient light. The high shutter speed and small aperture required to freeze movement and maximize depth of field always required more light than was generally available. I just blasted every subject with strobe light and in return I got vivid colors.

All that changed on a dive in September 2012 when I saw this amazing anemone with shining orange tentacles. It was sitting at a depth of 5 meters in the shadow of a kelp forest. The tentacles seemed to be glowing as if they had neon lights in them. I was so eager to capture this surreal scene that I took a couple of pictures before I even realized that something was wrong. The colors of the image on the camera's LCD screen seemed washed out. The vivid orange, almost red, tentacles were now a dull orange and the dark green center was a brown color on the camera screen.

At home I tried some post-processing tweaks

to recover the colors that I had seen underwater. I quickly realized that this was not a simple white balance problem. I use only Canon DPP software for post processing because sometimes the colors of the subjects that I photograph are so unbelievable that I have been accused of "manufacturing" them digitally with color saturation in the past. After that reality check I decided to restrict post processing to a minimum. In a way the progress of digital editing software has tainted the credibility of photography.

That failed editing attempt set me on a mission to see if I could capture the image in camera just as I had seen it underwater. After describing the problem to my "strobe mentor" he pointed out the root cause with a simple science lesson. Underwater colors disappear in the order ROYGIBV (red, orange, yellow, green indigo, blue, violet). Thus at 5 meters underwater the red light has all been filtered out. By adding strobe light I have recovered some of the lost red light and the washed out colors that I saw on the camera screen was thus the "true color".

Now I had a scientific explanation but still no photographic evidence of this magnificent underwater scene. In order to capture this photo I would have to turn off the strobes completely and learn how to get proper exposure by relying on Shutter speed, Aperture and ISO settings only. This was a real challenging prospect for me since I was so spoiled by strobes that automatically took care of the exposure. Luckily anemones do not travel often and this one was situated on a very unique rock face that I could find again so 3 months later I had a weather window and a second chance to get this shot right. I took the first picture with both strobes turned on as a control test and then another with the same settings and strobes turned off. Although the absence of the strobe light caused the second image to be underexposed it was not so bad that a brightness adjustment of 1.83 stops in Canon DPP could not recover the detail in the image. The color improvement was immediately visible.

At this stage I have to admit that the color of the second image is not totally untouched. I had to correct the white balancing because I had changed the camera white balance setting to "Custom" in an effort to rule out white balance as possible cause of the problem, but then I forgot to calibrate the custom white balance underwater. Luckily the anemone had some white parts in its mouth and I used it for the "Click white balance" function. Even though I still had to do some degree of post processing the lost color riddle was solved and it was clear that I had to re-evaluate my lazy habit of just blasting everything with strobe light.

For my next shot I tried to get the whole anemone in the frame, meaning I had to back off a couple of inches due to the narrow field of view of the 60mm macro lens. This resulted in more underexposure which I tried to fix by increasing the ISO setting to 400. This was another first for me as I never used ISO settings above 200 before for fear of digital noise. What I learned here was that ISO 400 worked just fine on my camera and digital noise was not a problem. The one thing that I could not fix in camera was the light diffusion caused by particles in the water which added a hazy effect to the image. In an effort to avoid this problem I planned to use a close focus wide angle setup next time so that I can frame the whole image while remaining closer to the subject.

The dive site with tide coming in – Cape Columbine nature reserve West Coast South Africa.

This whole experience taught me the true meaning of what David Doublet was saying in an article that I read. The author interviewed a couple of world famous underwater photographers and asked them what advice they would give to new underwater photographers. There was the usual "get closer" and "shoot up" advice but when it was David Doublet's turn he said: "know the controls of your camera like you know your car". If you think about it, by the time you are competent enough

Some months later – blue water dive with Cape fur seals. Wide angle shot with no foreground to light so strobes are turned OFF.

to take your car on the freeway you know from muscle memory where each gear is, where the indicator light switch is and at what speed you can safely go around a corner. The lessons I learned about my camera's performance came in very handy one month later when I was presented with a rare 15 meter visibility blue water dive and my first real wide angle scene. Since the fast swimming Cape fur seals kept to a safe distance where my strobes were useless anyway, I had only ambient light to rely on. Thanks to the lessons I learned I knew I could get the shot without strobe light and now I have a keepsake of the moment on my screensaver at work to brighten up my non diving days.

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