Egg-cellent shot!

by Alex Tyrell

As I work for a dive resort in the Philippines I am diving more or less on a daily basis, so I get to witness the breeding cycles of the marine creatures on our dive sites throughout the month. This (sometimes) lets me plan my photo dives to coincide for when fish have eggs, or if I find a creature with eggs whilst I am guiding, I am then able to return later with my camera. I appreciate that not everyone is in this position, but a bit of research into your potential subjects spawning habits and some planning ahead of time can improve your chances of getting shots of eggs in the marine environment.

Spawning:

The majority of fish species mate in a method known as broadcast spawning (or pelagic spawning), meaning that they release free floating gametes (sperm and eggs) into the water column to be taken away by the current. This normally involves a male and female of a particular species (but can sometimes involve aggregations of fish) participating in a 'spawning rise' that are typically very quick and culminate in the release of gametes at its peak. This usually occurs around dusk, a time that the majority of divers are out of the water as they have finished their day dives and have not yet started their night dive. This behavior is therefore not regularly photographed. An exception would be Mandarinfish in the tropical Indo-Pacific region where numerous dive operations run daily sunset dives to witness this mating ritual. Broadcast spawning in most species normally occurs when there is the biggest tidal movement, so around full and new moon. This ensures that the fertilized eggs are dispersed far and wide by the current. The eggs are very small and virtually transparent, so photographers would concentrate on capturing the

(Top) Saddleback Anemonefish (/ Amphiprion polymus/) - Nikon D200 in Subal ND20 with Inon Z240 strobes, Micro Nikkor 60mm + Kenko x Teleconverter, f/36 1/250th ISO 100, taken at Giant Clams, Puerto Galera, Philippines
(Right) Flamboyant Cuttlefish Eggs (/ Metasepia pfefferi/)- Olympus C60z with Inon UCL 165 AD lens and Inon D2000 Strobe, f/8 1/40th Exp. Comp -1 ISO 64 taken at Hairball, Lembeh Straights, Sulawesi

mating sequence rather than the eggs themselves.

Another spawning method rarely witnessed by divers is internal fertilization, which can then lead to either the bearing of live young or the laying of eggs. With a few exceptions Elasmobranches (sharks and rays) are the only fish species that practice this spawning method. Divers in the tropics do not commonly see elasmobranch eggs.

The spawning methods that probably interest photographers most, as this allows us to photograph the eggs themselves, are benthic egg laying and those creatures that perform parental duties by looking after the eggs in their mouths or attaching them to their body. Different creatures will have eggs at different times of the month based on the lunar cycle, which dictates the tidal movement. It is therefore important to know your subjects mating habits, as if you time it wrong there will not be any eggs to photograph! Normally the eggs will hatch when there are stronger currents, so around the time of the full and new moon, which disperse the oceanic larvae many miles away. Knowing the moon phase and tidal state is important so you can capture images of the eggs when they are a silvery colour, meaning the yolk has been consumed and the egg is at an advanced stage, sometimes letting us see the developed embryo's inside the casing.

Equipment & Techniques:

Techniques and lens selection for shooting fish eggs will vary dependent on the species. But in all cases a good measure of patience is required to enable you to get good images. Lighting is not too technical for most egg shots, so straightforward front lighting works well. A single strobe is sufficient, however in some cases, especially when using diopters and close up lenses, you will probably need to select a small aperture to get the required depth of field so this is where additional light from a second strobe is preferable. Also, if you are shooting a shy subject from distance the extra strobe power in beneficial.

A macro set-up is the norm for capturing images of marine creatures eggs, as the subject is generally quite small. On an SLR, a 50mm/60mm macro lens will work, but a 100mm/105mm macro lens enables 1:1 reproduction ratio with a decent working distance, letting you light the scene more easily. With the 50mm/60mm macro lens the subject needs to be very close to the front of the port to get the required magnification, which can make lighting more challenging. The subject will obviously dictate the lens selection you are shooting and whether you can get very close to them or not.

In some cases you will need even more magnification to record the detail of the eggs, like the eyes inside, so the addition of a diopter/close-up lens can really help. These attach to the front of your lens and reduce the minimum focusing distance enabling you to get closer to your subject providing greater magnification. Use these with the 100mm/105mm lens, as the 50mm/60mm lens focuses very close already, so it does not really benefit from having a diopter attached. Another option is a wet-lens like the MacroMate from Backscatter or the Subsee Diopter from Reefnet. Both of these let you get twice life-size magnification or more in the case of the +10 version of the Subsee, but will reduce the depth of field dramatically so small apertures are required - I regularly use f32 or f36 with my MacroMate. This set up will work for eggs that are on the substrate, like with Anemonefish, but for more shy subjects the like Jawfish (that are a mouth-brooder) you cannot normally approach that close, so it is hard to

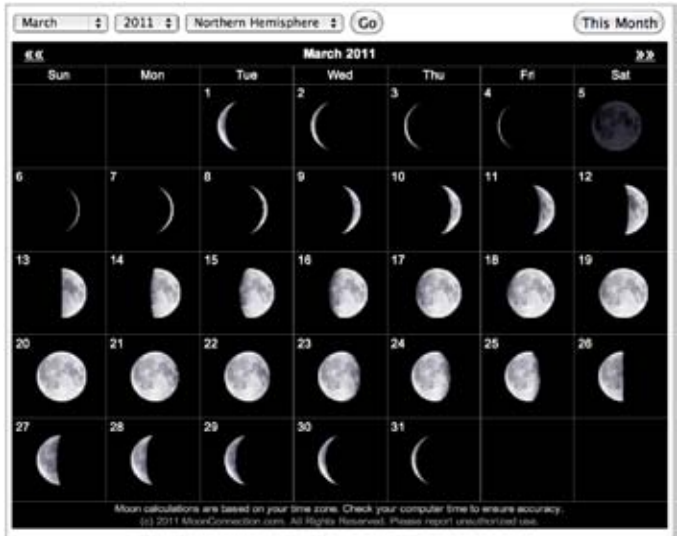
Ringtailed Cardinlfish (/Apogen aureus/)- Nikon D200 in Subal ND20 with Inon Z240 strobes, Micro Nikkor 105mm + Kenko 1.4x Teleconverter, f/11 1/250th ISO 100 taken at Sabang Wrecks, Puerto Galera, Philippines

get a tight facial shot with this set up. This is where a longer macro lens like a 200mm would work well, but this is a lens that not too many underwater photographers own, myself included. An alternative (and cheaper) option is to use a Teleconverter like the Kenko Pro series, which fit between the camera and lens. They come in different magnification strengths, the most popular being the 1.4x, 1.5x and 2x which simply magnifying your lens by the relevant ratio. So a 60mm lens with a 2x T/C turns the lens into a 120mm on a FX format sensor (or approx. 135mm on a DX format sensor) but still retains the same minimum focal distance. A 105mm lens with a 1.4x T/C will become approximately 150mm on an FX sensor or 240mm on a DX sensor. A word of warning for those that own the new Nikon 60mm AF f/2.8 ED lens – it does not autofocus with a Teleconverter!

Timing:

In a lot of instances timing is crucial to catch your subject whilst they have eggs. You therefore need to know the phase of the tidal cycle so you can coincide your dive for when the fish are spawning or have produced eggs. Some species spawn at various times through the tide cycle, so timing is not so important. And for some divers they are simply unable to time their dives with the moon phase, so it can be an element of luck whether eggs are found during the dive.

For those not familiar with moon phases, the table below explains the different stages of the cycle:



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New (also called the Dark Moon) - not visible
Waxing Crescent
First Quarter - commonly called a "half moon"
Waxing Gibbous
Full - we can see the entire illuminated portion of the moon
Waning Gibbous
Third Quarter - another "half moon", but the illuminated part is opposite of the First Quarter
Waning Crescent
New - back to the beginning

Local tide tables can be obtained from many places and you can even get iPhone Apps that will let you know the tidal state in many locations worldwide.

Subjects:

I nearly exclusively dive in the Indo-Pacific region having been based here for a number of years working as a Dive Instructor/Divemaster/Photo Pro. The following subjects are, therefore, from the aforementioned area. If you dive elsewhere, like many of you will, you will need to do a bit of research into the local marine life to get an idea of the potential subjects you may encounter. Below are some of my more recent encounters with marine creatures with eggs. There are obviously many more options for egg photo's and still quite a few on my list of shots that I want!

Mandarinfish (/Synchiropus splendidus/)- Nikon D200 in Subal ND20 with Inon Z240 strobes, Micro Nikkor 105mm, f/22 1/125th ISO 200 taken at Beach Cafe Jetty, Derawan, Kalimantan

Mandarinfish

These are probably the most commonly photographed species of spawning fish, as they are found in the same area day after day and do not move around much. Locating them is not therefore a problem once you know where they are, which

is usually amongst Staghorn Coral, Lettuce Coral or similar. They mate most evenings at sunset and can spawn a number of times in the short time period before the sun disappears over the horizon and it turns to night. The larger male will have numerous females in the area that they live and will perform a courtship ritual enticing them to mate with him. When the female accepts the invitation, they position themselves side by side and begin a slow spawning rise, which culminates in the release of eggs and sperm before they quickly dart back down into the coral. Occasionally a male with mate with two females at the same time! The shot that we are after is the pair together with the eggs in focus, but that is easier said than done, as split second timing is required. A bit of luck and trail and error is the norm to get this! I have found that the 105mm lens to be most effective in continuous servo AF mode, which enables the camera to track the moving subject and the shutter release to fire without you having to lock the focus on the subject. You may get a few out of focus shots, but I have found that this is outweighed by the ability to shoot at the exact moment that the gametes are released. Also setting the camera to continuous shooting mode can be advantageous as you can normally get 2-3 exposures in succession, increasing the chances of getting the eggs as they release. You should note that bright lights seem to distract Mandarinfish from mating, so use a red filter over your focus light or flick your Sola 600 into the red LED mode.

Anemonefish

These are one of the easier fish to photograph with eggs, as they live in their host Anemone and do not stray far from it. They are a benthic egg laying species, normally depositing their eggs on a flat rock or similar directly next to the Anemone that they live in. I have found this to occur on the Waxing Gibbous and they develop ready to hatch around the Full Moon. Anemonefish are at their most aggressive when they are protecting eggs and they have bitten me on numerous occasions. Fortunately their mouths are only about a centimeter wide and do not inflict much damage, leaving a semi-circular row of teeth marks and maybe a small trickle of blood at the worst! If you are patient and let them get used to you, you will find that they tend for the eggs regularly, blowing oxygen rich water over them from their mouths and brushing them with their fins to remove any algae build-up. With either the 60mm or 100mm lens you can get shots of the dutiful parent tending to the eggs, but for real detail in the eggs additional magnification is required. As the eggs will not move and the Anemonefish have to return to where they were laid to tend to them, you can approach quite close so can use either Diopters or Teleconverters to get the desired magnification ratio.

Saddleback Anemonefish (/Amphiprion polymus/) - Nikon D200 in Subal ND20 with Inon Z240 strobes, Micro Nikkor 60mm + Kenko 2x Teleconverter, f/36 1/250th ISO 100 taken at Giant Clams, Puerto Galera, Philippines

Ringtailed Cardinlfish (/Apogen aureus/)- Nikon D200 in Subal ND20 with Inon Z240 strobes, Micro Nikkor 60mm + Kenko 2x Teleconverter, f/8 1/250th ISO 100 taken at Sabang Wrecks, Puerto Galera, Philippines

Cardinalfish

Some species of Cardinalfish are mouth brooders, meaning the male will incubate the fertilized eggs inside its mouth, therefore protecting them from predators. When the eggs are first deposited in the mouth around

Yellowbarred Jawfish (/Opistognathus randalli/)- Nikon D200 in Subal ND20 with Inon Z240 strobes, Micro Nikkor 105mm, f/32 1/125th ISO 100 taken at Beach Cafe Jetty, Derawan, Kalimantan

Peacock Mantis Shrimp (/ Odontodactylus scyllarus/) - Nikon D200 in Subal ND20 with Inon Z240 strobes,Sigma 20-70mm @ 70mm, f/13 1/60th ISO 100, taken at Atlantis House Reef, Dumaguete, Philippines

the New Moon they are a milky white colour and they develop through the Waxing Crescent to a point when you can clearly see the eyes of the embryo inside the egg casing close to Full Moon. The tell tale sign that an individual has a mouth full of eggs is an extended jaw cavity. If you look closely you can see the eggs inside the mouth, but they do not open their mouth that far so you cannot easily get a clear shot. However, if you observe them you will notice that every few minutes they will spit the eggs partially out of their mouth, rotate them around and then suck them back in. This is known as 'churning' which aerates the eggs, removes waste and allows the embryos to mix so they develop equally. This is the moment that you need to shoot, so once again patience is the key. A close approach is not normally possible, as they will simply turn away, so a longer lens like the 105mm or 200mm is favorable. I normally use the 105mm together with a 2x Teleconverters to get a nice tight shot of the face with detail in the eggs. The continuous servo AF and continuous shooting mode can help here as well, as again you have about a second or so to bag the shot.

Jawfish

Jawfish are another species that mouth brood their eggs to provide protection from predation. The eggs are stored safely in the male's mouth for around 5 to 7 days before they are ready to hatch. The eggs will develop quickly through this period; starting off a milky white/yellow colour and changing to silver as the juvenile grow inside the egg casing. When I worked on a live-aboard visiting the island of Derawan in Kalimantan (Borneo) we used to dive to watch the eggs hatch at sunrise around 5 -7 days after the Full Moon (so in the Waning Gibbous). I seem to recall that in the Caribbean they hatch at sunset (I may be wrong!). The male Jawfish that is brooding eggs is normally very cautious and will retreat into its burrow as you approach. Not to sound like a broken record, but once again patience is the key to getting the shot. A slow approach is required and then you need to spend some time letting the Jawfish become accustomed to your presence. Similar to Cardinalfish, the eggs are churned periodically and this is the moment when you can get a good shot. A 105mm lens is ideal for these shy fish, letting you get the required magnification without encroaching on their personal space.

Other Subjects

There are various other marine creatures whose eggs can make interesting subjects. In the critter diving destinations of Asia you can find Flamboyant Cuttlefish eggs in discarded Coconut shells, various Crabs and Shrimps will have eggs at certain times of the month, Nudibranch's can be seen laying egg ribbons and, if you're really lucky, you may even find a Blue Ringed Octopus or Wonderpus with eggs attached to the underside (something I'm still waiting to see myself).

So to summarize, get to know your subject and it's spawning cycle, plan your dives to coincide with when eggs are present and have the right lens on to maximize your chances of getting a great 'egg image'. Be patient when you find your subject and a bit of luck always helps!

References: Reef Fish Identification: Tropical Pacific by Gerald Allen, Roger Steene, Paul Humann and Ned DeLoach. Reef Fish Behavior Florida, Caribbean, Bahamas by Ned DeLoach and Paul Humann. Available form www.fishid.com.

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