



Edited by  
Peter Symes

# Beyond the Muck

Text and photos by Mike Bartick

**Muck diving is a term used quite frequently these days that can be applied to either a dive site, a type of diving or even an entire region like Lembah Strait in Indonesia or Anilao in the Philippines. These areas of the Indo-Pacific have consistently ranked amongst the highest in terms of high coral counts, reef fish and of course the high impact Holy Grail of critters.**

The intertidal and estuary zones typically associated with muck dives provide much more overall for the eco-system than what meets the eye. Nutrients flowing into the ocean current mix to create an amazing bio-mass of diversity that ranges from bull rush sea grass to bull sharks. However, the critters most encountered while muck diving are typically benthic bottom dwelling organisms. These critters as we call them have

evolved elaborate and eccentric life styles to survive on the substrate and are unlike the ocean roving pelagic fish above them in many ways.

Pelagic fish hunt long range, tend to be bi-colored, are fast and are more adept to following the fluctuating current and food source. Benthic critters, on the other hand, are forced to adapt to their environs on the bottom with limited movement and hunt close range. These critters use a combination of "Lie and wait" hunting and "ambush attacks", relying heavily on aggressive camouflage that mimics or matches their surroundings. The same current lines that feed the higher chain (food grade fish) also brings food and organisms for the lower chain animals that are sought out to photograph.

The more productive dive sights that support an overall abundance of biota are intertidal sand flats, fringing reefs and tidal sand banks formed in-part by fluctuating current lines. These currents carve and shape the substrate that often mix within the intertidal zones and create an underwater oasis for encrusting sea life.

In the shallows, fringing beds of sea-grass supports a mix of critters like ornate and common pipefish, flatfish, frogfish, urchins, crustaceans, opisthobranchs, vertebrate and invertebrate sea life.

In addition the sponge, sea squirts, tunicates, sea fans and soft corals that also thrive here provide both food and protection, creating a unique habitat for an abundance of unique sea life on the bottom.

Like the big animal Holy Grail, there also exists the small animal Holy Grail that survives in this intertidal benthic realm with names that are almost as dazzling as their appearance. Rhinopias, hairy frogfish, stargazers all sound like they belong in a superhero comic book, and some even have the abilities to match. The evolutionary process has been both rigid and creative with these compelling creatures forcing them to adapt or pay the ultimate price.

The solitary juvenile pinnate spadefish (*Platax pinnatus*) survives by its color and rapid movements. Living between rocks and small crevices, it mimics the colors of a venomous flatworm. Found exclusively in the Indo-Pacific, its midnight



Juvenile pinnate spadefish side view (above) and front view (inset) mimics a venomous flatworm



In the photo at left, the smaller male (left) and the larger female (right) hairy frogfish meet in courtship to mate; A stargazer lies in wait to ambush passing prey (right)



third and final step, as it ambushes its prey with its lightning fast gape strike, often consuming them in one gulp.

When frogfish are found together, it is generally a strong indication that mating will occur soon. The female is almost always the larger of the two, as she needs to be a bit larger than the male in order to produce the mass of eggs. The smaller *A. striatus* (male) pictured above was attracted to this lovely female a day earlier by an irresistible pheromone.

black and vibrant orange colors will fade to a drab silvery coloration, as it enters into the second phase of its lifecycle.

The *Antenarius striatus*, or hairy frogfish, are a highly sought after Holy Grail critter due in-part to their photogenic behaviors and for their unusual appearance.

The *A. striatus* is a bit more sophisticated than many other fish for using a special method to hunt. Impossible to swim and hunt the *A. striatus* is able to do so with very little movement on their part and is achieved by exciting their prey.

First the hairy frogfish will release a scent, which alerts nearby fish or shrimp down current that food is near. This excites their prey, and as they follow the scent closer, the frogfish switches to its second strategy, visual stimulation using its lure.

The frogfish now relying on its lure drops it out and waves it around. This excites the victim even more, not knowing that the algae or soft coral it sees is actually a hairy frogfish, cunning and powerful. As the fish moves in for its meal, the hairy frogfish unleashes the



The female *A. straitus* actually selects the right male in a natural process that could involve either eating or just ignoring the rejected suitor.

### Nocturnal critters

Muck dive sites can get even more interesting at night with the cast of nocturnal critters. The exact same dive site will yield a whole new team of characters after the sun sets and provides for some better than sci-fi photo ops.

The white margined stargazer (*Uranoscopus sulphureus*) is perhaps the most macabre looking of all the critters. Its name is derived from its appearance, as its eyes are situated on the top of their heads appearing as if casting a never-ending gaze upon the night sky above. A venomous ambush predator, the positioning of its eyes are very useful,

as they bury themselves under the sand to hunt. When another benthic fish or smaller unsuspecting fish swims closely overhead, the stargazer springs from its burrow and engulfs the fish in a flash, then quickly buries itself again. In addition to being venomous, the stargazer can produce an electrical charge and conceals a lure in its mouth—talk about equipped!

### The bobbit

No write up on muck diving would be complete without something about the elusive bobbit worms (*Eunice aphroditois*). These carnivorous polychaete worms are the things that nightmares are made of. Growing up to six feet in length and a diameter of three inches, these creepy critters play for keeps.

The bobbit's calcified jawbone, tentacle feelers and chemical receptors all work in unison to attract and kill their prey. Often seen bobbing up and down in the sand on night dives, bobbit worms are highly sensitive to light. Lunging and snapping at unsuspecting prey seems

Hairy frogfish hunting with lure



Babbler worm bobs up and down, snatching fish right out of the water column

The tiny commensal pandalid shrimp, *Miopandalus hardingi*

to be its technique of choice, often snatching fish right from the water column, slicing them in half or pulling them down, below the sand.

### Super macro

Super macro techniques have gained popularity in the last several years, giving us a closer look at some of the very small yet decorative shrimp, and other interesting critters. Sometimes called the insects of the ocean, they all seem to bind dives together and keep a photographer's shutter snapping. The bazaar



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### Cephalopods

The docile blue-ringed octopus and flamboyant cuttlefish are both highly sought after. Holy Grail finds that can turn any dive into a free-for-all very quickly. Each of these amazing cephalopods has enough bacterial neurotoxin to kill dozens of fully grown men. Tetrodotoxin (TTX) is a powerful digestive byproduct transmitted through saliva from a blue-



Red hairy shrimp

horned shrimp is a prime example of the incredible tiny creatures to be found, but can pose many challenges when trying to photograph them.

A commensal or partner shrimp (*Miopandalus hardingi*) is associated with brown or green gorgonians and are easily overlooked.

The very small hairy shrimp are part of the broken back complex (*Phycocaris sp.*). They can be extremely compelling and difficult to photograph. They are normally associated with algae growth of the same coloration but can also be found on small rocky outcrops, near the algae.



Algae shrimp, *Phycocaris simulans*



ringed (*Hapalochlaena maculosa*) octopus' bite. The flamboyant cuttlefish, on the other hand, (*Metasepia pfefferi*) is also docile yet deadly and can inadvertently transmit the TTX just by touching its skin tissue. Although not as effective as the bite, scientists still limit contact and exposure to them, keeping it to a minimum.

## Scorpionfish

A member of the scorpionfish family, the *Rhinopias frondosa* can create very large ripple effect topside, wherever one turns up, especially in small communities like Anilao. It's nearly the equivalent of a gold rush, as guests flood in from all over the world for a chance to photograph one of these amazing critters. An ambush gape strike predator, they will drag themselves along the bottom toppling forward then rolling back mimicking an injured fish. When a predatory fish from above sees the oppor-



Blue-ringed octopus (far left) and flamboyant cuttlefish (left) eating. Both carry poisonous neurotoxins; Veined octopus or coconut octopus, *Amphioctopus marginatus*, on eggs (center)

## Nudibranchs

The frontal view of the *Nembrotha kubaryana* nudibranch reveals its intricate textures and details. Its favorite food source is tunicates and are considered common.

A special class is reserved for the ever colorful and slow moving nudibranch. These special little gems are a dynamic bunch made for underwater photographers. The color patterns and textures, shapes and details can be show-stopping. But it's not just their looks but the science behind them, too, that



tunity of an easy meal below them, they swoop down to investigate. The *Rhinopias* unleashes its bucket mouth gape strike, inhaling the fish with haste, then trundling forward, it moves on.

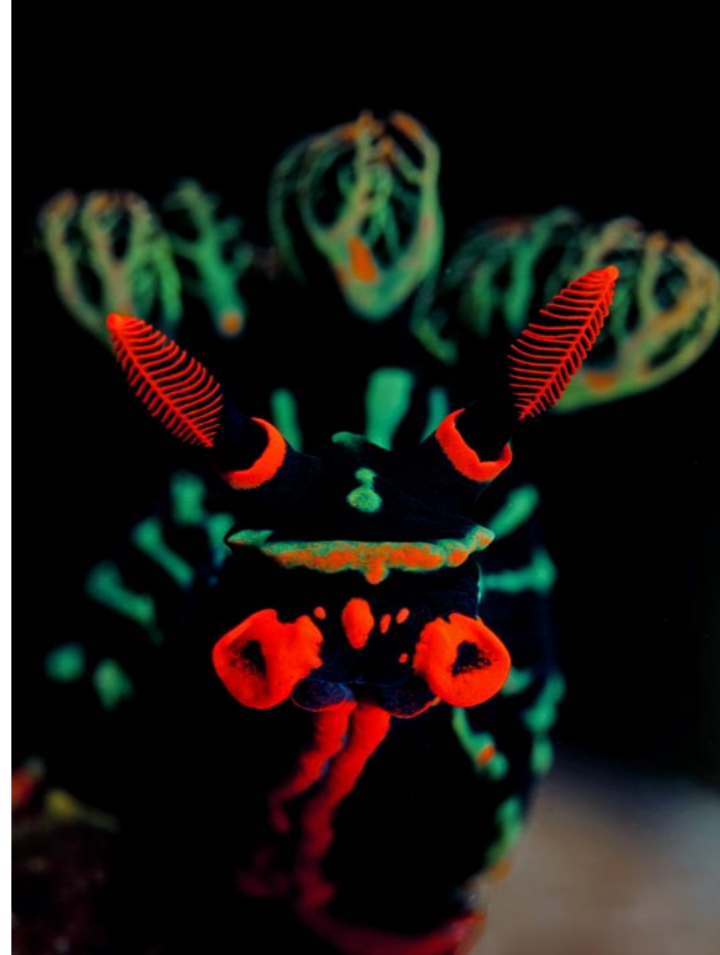
is appealing. Terry Gosliner from the California Academy of Science calls them "the most diverse fauna on planet earth". I would have to conclude he's 100% spot on with that statement.



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*Rhinopias frondosa* is a member of the scorpionfish family





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## Fish

The estuary batfish (*Haleutia sp.*) is truly a rare find amongst finds. The natural data on this fish just doesn't exist, unlike many of the other critters out there. It is believed to be a deep sea anglerfish. This one (shown above) was found in the shallows by my trusted assistant, Gladys, and later positively identified using the *Reef Creature ID* book. It was so cryptic and blended so well with the substrate that when I glanced away for a second, it was lost forever.

The spotted xenia pipefish (*Siokunichthys herrei*) is just one more amazing critter find from Anilao. Reliance on sharp guides nearly always pays off, time and time again. Experience has taught me not to be complacent and to always come when my guide waves me over. One of the advantages of working in the Indo-Pacific region is the opportunity to find and document rare creatures like these.

Beyond the Holy Grail are the oddities that only Mother Nature

allows us to see. I am often surprised at what is found while muck diving and quickly refer to the identification books afterwards. The sheer amount of opportunities of seeing something new or undiscovered is part of the main draw in muck diving.

Remember, research, hiring a professional guide and persistence pays off when hunting for that special critter. Communicate with your guide and the resort before your arrival and let them know what it is that you would like to see.

Now get out there and have an adventure! ■

*A special thanks from the author goes to Crystal Blue Resort ([www.divecbr.com](http://www.divecbr.com)). California native Mike Bartick is a widely published underwater photographer based in Anilao, Philippines. A small animal expert, he leads groups of photographers into Asia to seek out that special critter. For more information, visit: [Saltwaterphoto.com](http://Saltwaterphoto.com)*



CLOCKWISE FROM TOP LEFT: Estuary batfish, *Haleutia sp.*; *Nembrotha kubaryana* nudibranch; Spotted xenia pipefish; *Hipseledoris sp.* nudibranch

