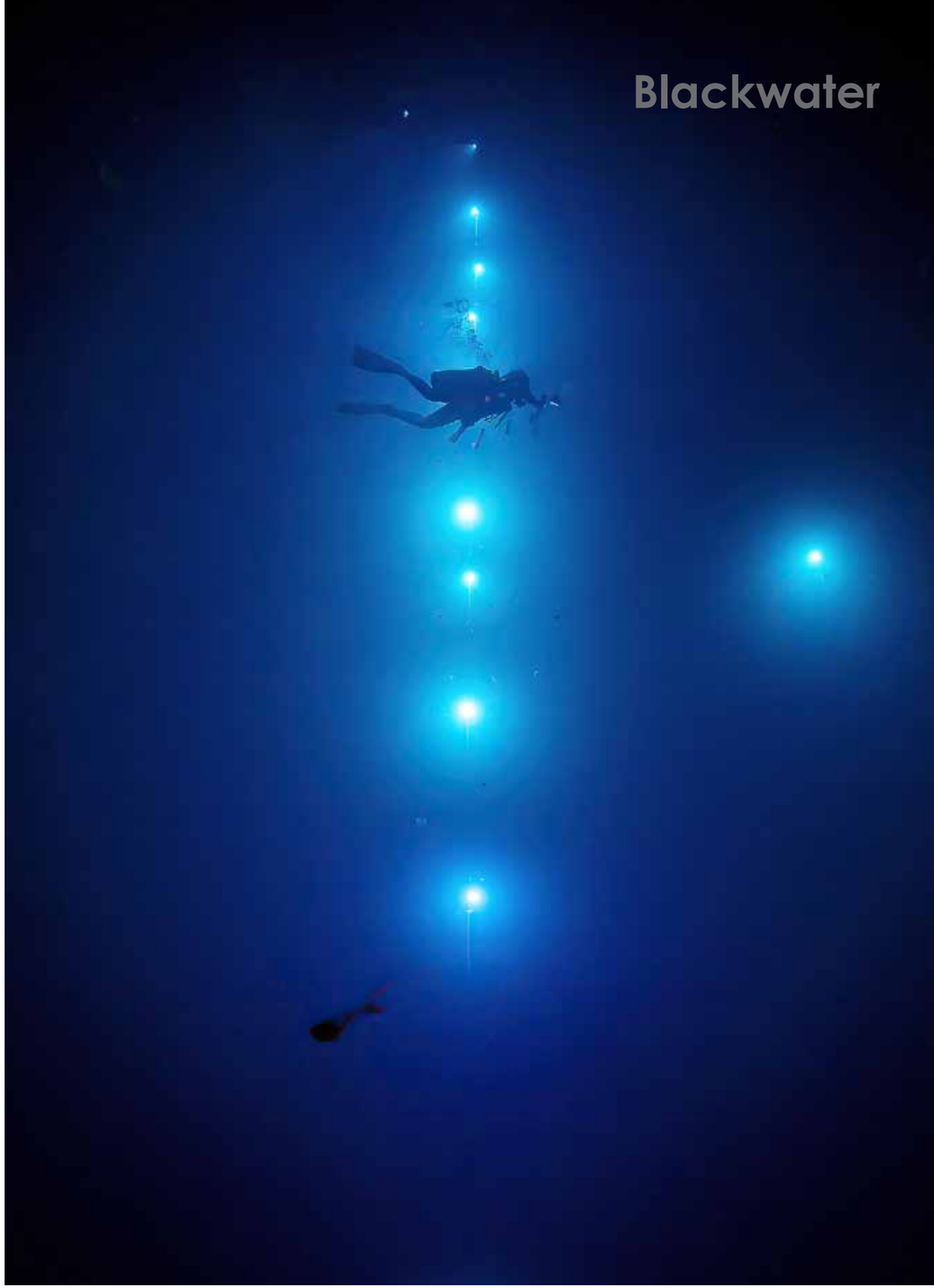
Blackwater Diving *in Cozumel*

When Darkness Reveals Another Ocean

Text by Franz Behrmann
Photos by Robert Stansfield

Blackwater



A diver (above) follows the illuminated downline through the darkness. Far from the reef, the lights become the only point of reference in the open ocean. A megalopa larva (top left) drifts through the open sea of the Caribbean, its disproportionately large eyes helping it navigate life in the pelagic realm before settling on the seabed. A flounder (previous page) drifts through the Caribbean's open waters, its elongated fin rays giving it an almost alien appearance.

Aside from Cozumel's colourful reefs and dazzling drift dives, experienced divers and underwater photographers can enjoy blackwater diving for encounters with weird and wonderful sea creatures. Franz Behrmann has the story.

Have you ever imagined exploring the deep sea? Absolute darkness. Weightlessness. Strange creatures, unlike anything found on land—or on the reef. For most divers, encounters with this hidden world belong to the realm of expensive submersibles and deep-ocean expeditions. But what if you could experience a glimpse of it without descending thousands of metres?

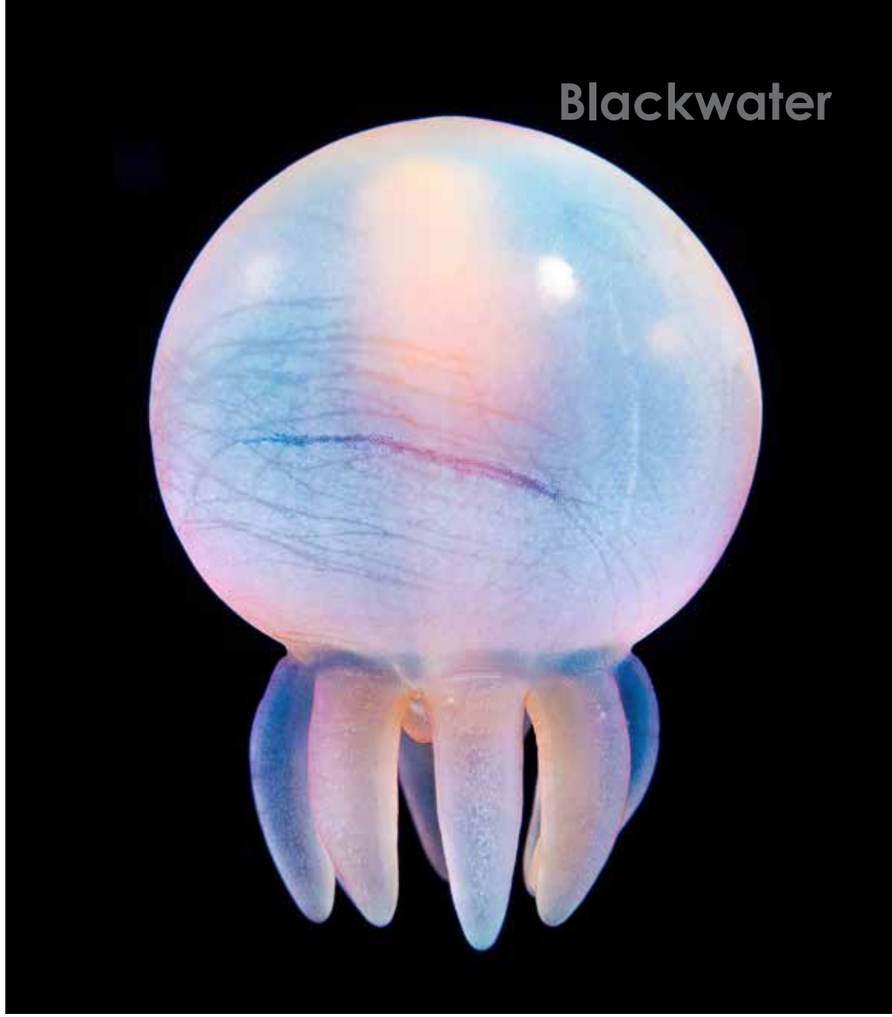
Cozumel is famous for its coral reefs and spectacular drift dives. But after sunset, another ocean waits beyond the reef, one where tiny fishes seek shelter among stinging tentacles, others masquerade as jellyfish, and creatures of almost impossible shapes emerge from an endless black.

Diving

Around sunset, while the last divers were heading back to shore, our boat was travelling in the opposite direction. Our destination was not another coral reef or shipwreck. Instead, we headed several kilometres offshore, towards deeper water and an entirely different kind of dive.

As the island slowly receded behind us, the last traces of daylight disappeared below the horizon. Blue faded into black. By the time the engines finally slowed, the lights of Cozumel were still visible in the distance. There was no reef, no sandy bottom, only hundreds of metres of open water.

"This is where the real fun starts," smiled underwater photographer Robert Stansfield, as the final prepa-



Blackwater

A juvenile tripod fish (left) displays its spectacular fin rays while drifting through the darkness of the open Caribbean. The first encounter comes sooner than expected. A delicate pelagic crustacean (above centre) drifts into the torchlight before disappearing back into the darkness moments later. A delicate sea anemone (above right) looking like a medusa drifting in the open ocean.

rations were made.

A weighted line carrying powerful lights was lowered into the darkness. Out here, in an otherwise featureless ocean, it would become our only visual reference. There was no wall to follow and no bottom to orient ourselves against—only a line of light disappearing into the black. This was blackwater diving. Masks on. Regulators in. Time to step into the black.

Standing at the edge of the boat, excitement suddenly mixed with doubt. Jumping into the open Caribbean at night goes against almost every instinct. I knew there was nothing beneath me for hundreds of metres, but knowing it and actually staring down into the darkness were two very different things.

Had I really made the right decision? What was I doing here?

Then I jumped.

The moment I slipped beneath the surface, all connection to the world above seemed to disappear. The boat, the horizon and the distant lights of Cozumel vanished from view. I was suspended in an underwater world, stripped of almost everything familiar. Only the beam of my torch and the illuminated line remained. Beyond their reach, there seemed to be nothing at all.

For the first few moments, the nervousness remained. But slowly, something else took its place. The darkness that seemed intimidating from the boat became captivating—almost hypnotic. I found myself staring into it, wondering what might be hiding just beyond the reach of my light.

And then, something moved.

An ocean hiding in plain sight

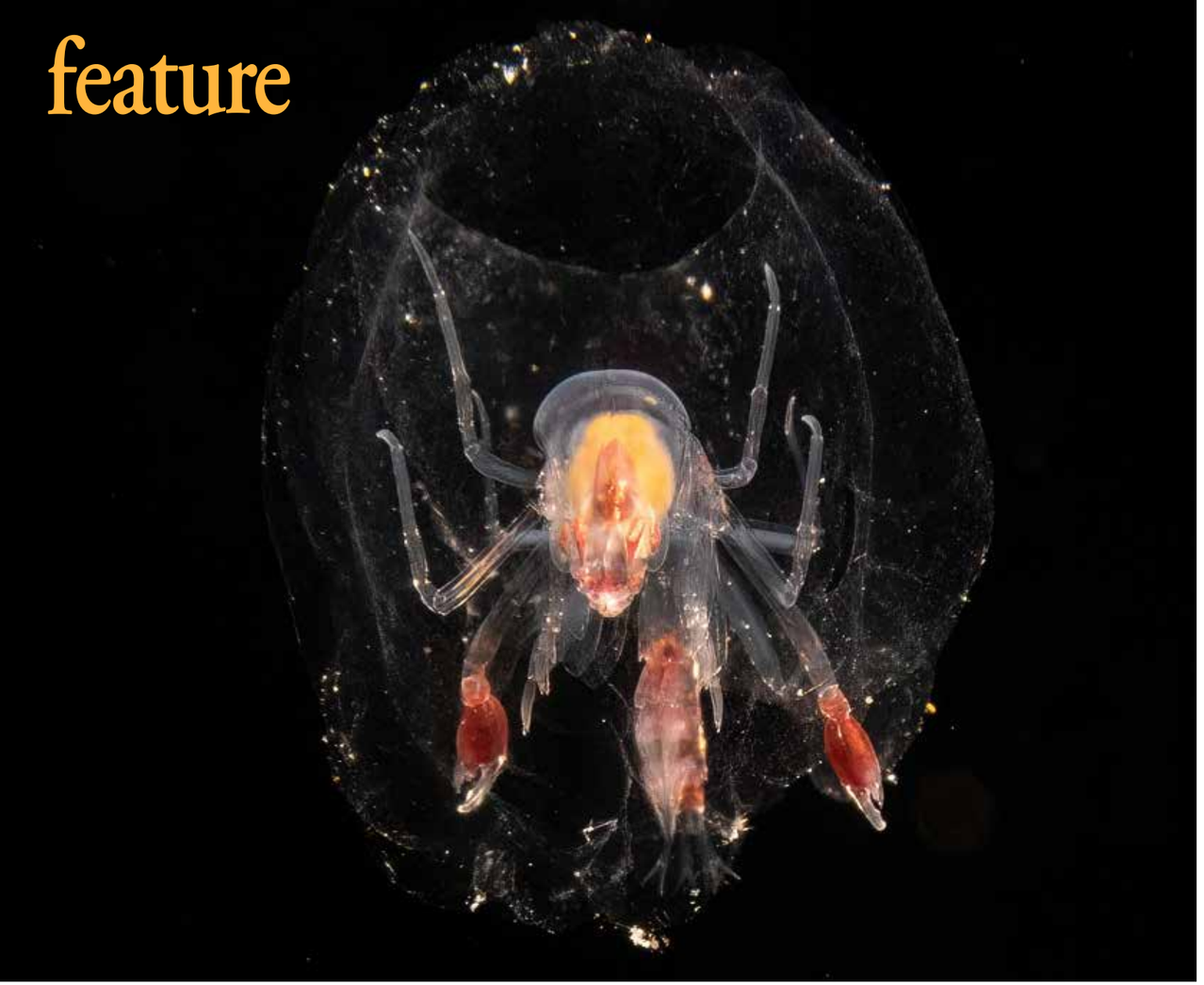
A tiny, transparent crustacean drifted into the beam of my torch. Moments later, a delicate anemone pulsed past. Then, a juvenile fish appeared, with a body so unfamiliar that I struggled to make sense of what I was looking at. A squid hovered briefly beside the illuminated line. But, before I could even raise my camera, it had already disappeared back into the darkness.

Soon, the problem was no longer finding life. It was deciding where to look.

The largest animal migration

The pitch-black water was never empty. We simply could not see what had always been there. Part of what surrounded us was connected to one of the most extraordinary natural phenomena on the planet.

Every night, enormous numbers of marine organisms rise through the water column under the cover of darkness, before many descend again around dawn. Known as the diel vertical migration, this nightly journey is often described as the largest animal migration on Earth. For a few hours, this nightly journey gives us the extraordinary opportunity to



Phronima carries its transparent barrel through the open ocean.

experience a glimpse of a world normally associated with deep-sea expeditions and submersibles.

It reveals a community that remains almost completely invisible to most divers exploring Cozumel's reefs closer to shore. And the longer we stayed, the stranger its inhabitants became.

Meet the alien

Some blackwater creatures merely look as though they belong in science fiction. *Phronima* comes remarkably close. Almost completely transparent, with prominent eyes and claw-like appendages, this small pelagic amphipod has an appearance that has repeatedly drawn comparisons with the creatures from the *Alien* series of films. It is even sometimes cited as a possible source of inspiration for their design. It is not every day that you get to pose for a photograph with something that looks as though it has drifted straight out of science fiction. Yet, here, that is exactly what can happen.

The resemblance, however, goes beyond appearances. Female *Phronima* attack gelatinous animals such as salps, remove much of their internal tissue and transform what remains into a barrel-shaped nursery. The female pushes this transparent barrel through the open ocean while her offspring develop inside. It is an extraordinary solution to one of the most fundamental problems of life in the pelagic realm: In the open

Phronima in its transparent barrel (far left). A female *Phronima* carries her developing young inside a transparent barrel, which serves as both shelter and nursery in the open ocean (left and above).

ocean, shelter is difficult to find. And *Phronima* is far from the only animal with an unusual answer.

Nowhere to hide

There are no coral branches in the open ocean. No rocks. No crevices. For a small animal surrounded by predators, survival may depend on remaining unseen—or convincing something larger that it is something else entirely.

For many pelagic animals, transparency is one solution. With little pigmentation and tissues that allow much of the surrounding light to pass through them, some fishes and crustaceans become extraordinarily difficult to distinguish from the water around them. Sometimes, little more than their eyes or internal organs reveal that an animal is there at all.

Others find protection in surprisingly dangerous company. Jellyfish and siphonophores provide some of the few floating structures available in an otherwise featureless environment. Small fishes and invertebrates can be found sheltering around gelatinous animals and among their tentacles. What appears dangerous to us may provide valuable protection against predators, less willing to negotiate their stinging defences.

Others rely on deception. Some pelagic fishes resemble the gelatinous animals around them so closely that shape, colour and movement can make it difficult at first glance to determine what exactly one is looking at.

Then there are the siphonophores themselves. Their delicate forms may look like single, fantastical animals, but they are actually colonies, composed of highly specialised individuals working together. Some trail tentacles armed with thousands of stinging cells through the darkness. For blackwater divers, the complexity of this floating world can therefore be reduced to two remarkably simple rules: Don't touch it, and definitely don't lick it!

Not every spectacular encounter, however, needs an evolutionary explanation. One of my favourite encounters comes when a diamond squid suddenly appears in the light. Instead of disappearing, it turns towards me and adopts a defensive posture, spreading its arms as if I had just challenged it. For a moment, I simply stare. Then, I get so excited that I catch myself shouting into my regulator—a largely pointless attempt to share the moment with everyone around me.

Or a comb jelly drifts almost motionless in front of me, rainbow-like bands of colour running rhythmically along its transparent body. The effect is strangely hypnotic—my eyes keep following the pulses of colour as they travel from one end of the animal to the other. Unlike many of the fleeting creatures in the black water, comb jellies often give photographers a little more time. Their slow movements and extraordinary play of light make them particularly rewarding subjects. And sometimes, the strangest creatures

A transparent eel larva (top left) drifts through the open Caribbean, bearing almost no resemblance to the elongated eel it will eventually become. A slipper lobster larva (top centre) spends its early life drifting through the pelagic realm, its paper-thin body providing remarkable camouflage. A transparent spiny lobster larva (top right) drifts through the open ocean, where it will spend months before eventually settling onto a coral reef. A juvenile anglerfish (right) drifts through the open Caribbean. While the adults inhabit the deep sea, their early lives unfold near the surface, where blackwater divers have a rare chance to encounter them.

are connected much more closely to their familiar reefs than their appearance suggests.

Changing appearances

Anyone who has looked at an old childhood photograph knows how dramatically appearances can change while growing up. In the ocean, some transformations take that idea to an entirely different level.

Many animals familiar from Caribbean reefs begin their lives looking almost nothing like the adults they will eventually become. Before settling into coastal habitats, their larvae may spend days, weeks or even months drifting through the open ocean.

The lobster, for example, begins its journey as a *phyllosoma*, an almost transparent, flattened larva with extraordinarily long limbs. It bears little resemblance to the heavily armoured lobster that will one day hide beneath a reef ledge.

Eels undergo an equally remarkable transformation. Their larvae are transparent and ribbon-like, looking almost nothing like the elongated inhabitants they will eventually become.

This is one of blackwater diving's greatest surprises for me. Not everything drifting through the darkness has risen from some mysterious abyss. Some of these apparent "aliens" are simply juveniles of familiar species. In a way, diving here feels like travelling backwards in time. Long before divers encounter these species among Cozumel's corals, part of their story unfolds out here, in the open Caribbean.

Revealing Cozumel's hidden world

For decades, Cozumel has been synonymous with diving. Its walls, crystal-clear warm waters and current-swept reefs attract divers from around the world. Yet, what happens several kilometres beyond those reefs after sunset remains far less familiar.

When I mentioned blackwater diving to a local instructor, who had been diving Cozumel's waters for longer than I have been alive, he had never even heard of it. Perhaps

A siphonophore (top left) is not a single animal, but a colony of highly specialised individuals working together as one drifting organism. A fish seeks refuge among the tentacles of a jellyfish (top centre), using its unlikely host as protection during its early life in the open ocean. A juvenile argonaut clings to a siphonophore (top right), using the drifting colony as both transport and protection. Only a few centimetres long, the transparent sea angel (right) seems weightless. The "sea elephant" (left), a very tiny swimming snail, is nicknamed for the trunk-like appendage extending from its head.

that is part of its appeal. Even in one of the world's best-known dive destinations, there are still experiences capable of surprising those who have spent decades beneath its surface. For now, it remains something of an insider's secret.

Dive operation

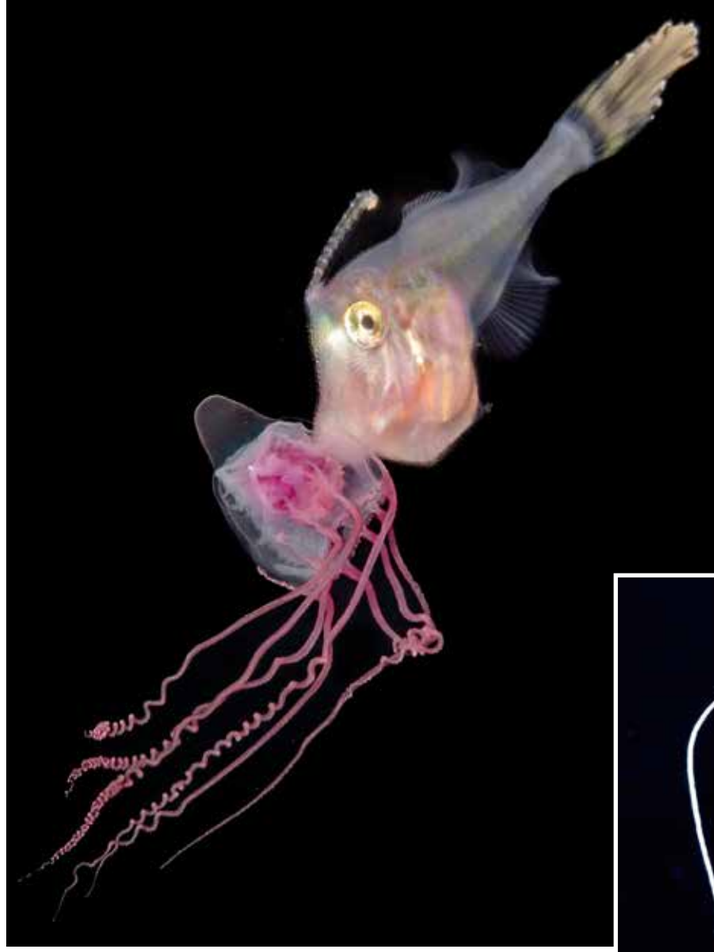
For underwater photographer and Marelux ambassador Robert Stansfield, that sense of discovery became something much more profound. Blackwater diving, he says, "definitely changed the way I think about life on this planet."

Eventually, that change in perspective became something he wanted other divers to experience for themselves. So Stansfield established a dedicated blackwater diving operation in Cozumel called Blackwater Cozumel, making the island one of the few destinations in the Caribbean where divers and photographers can regularly experience this hidden pelagic world.

Rather than simply adding another activity to an already famous dive destination, Stansfield's aim was to provide access to an ecosystem that most people had never realised was there. It was about giving others the chance to discover a side of the ocean that had changed the way he looked at it himself.

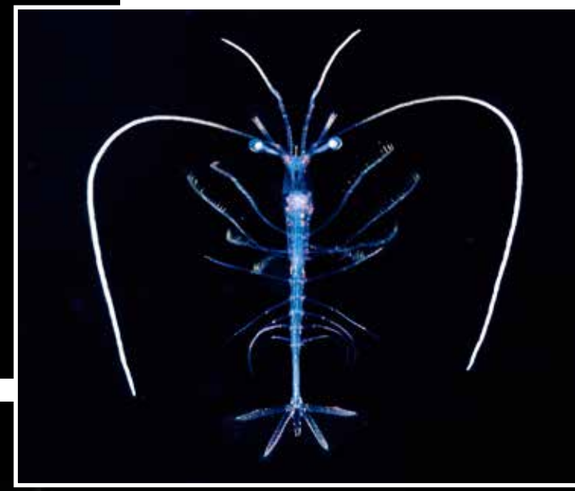
He has not discovered a new ocean. He has helped make one that was there all along more visible.

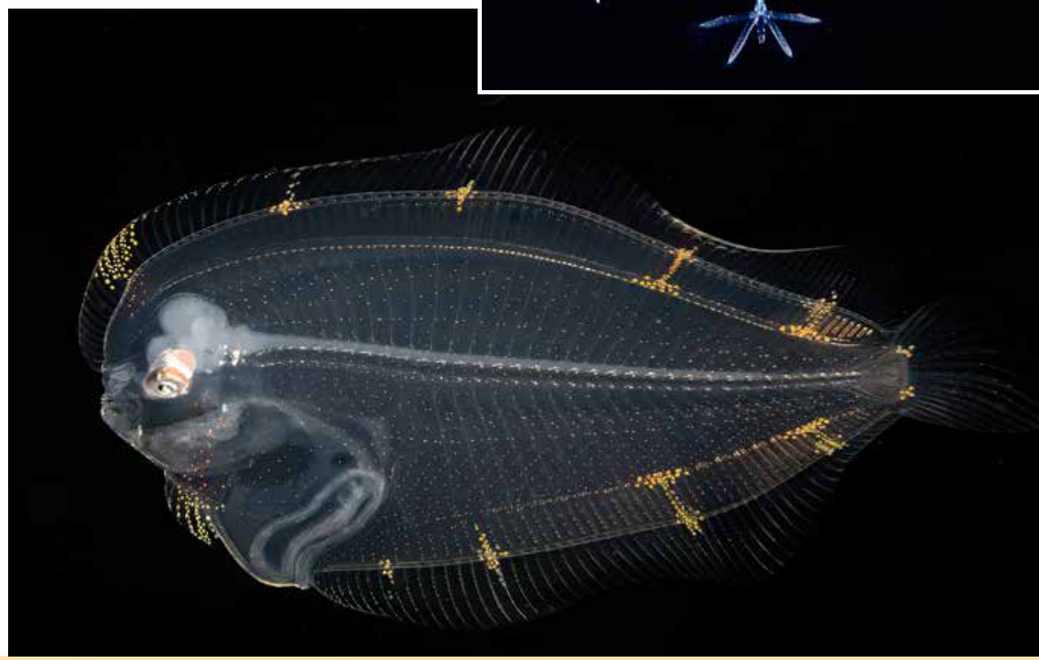
Cozumel is particularly well positioned for this kind of diving. Deep Caribbean waters can be reached within a relatively short boat ride from the island. Even several kilometres offshore, the island's lights may remain



Blackwater

A diamond squid (far left) adopts a defensive posture, spreading its arms and webbing to appear larger when threatened. The delicate, elongated arms of this pelagic octopus (top centre) make it one of the most graceful inhabitants of the nighttime ocean. For this juvenile filefish (left), a drifting jellyfish is more than shelter, it is a meal. Transparent crustacean with long antennae (below). Nearly transparent juvenile flounder (bottom).





visible along the horizon.

No two dives promise the same encounters. One night may bring squid and elaborate siphonophores, while another night may bring bizarre juvenile fishes and crustaceans, or animals nobody has ever seen before.

You never quite know what the darkness will reveal. Every unfamiliar shape carries the possibility of a new discovery. Every movement in the blackness begs the question of what might appear next. For a while, it feels less like observing the ocean and more like exploring it.

Ready for the black?

If you have ever wanted a portrait with an alien, this may be as close as you will ever get. Blackwater diving not only offers extraordinary encounters, but also the rare opportunity to photograph yourself alongside creatures that seem to have drifted straight out of science fiction.

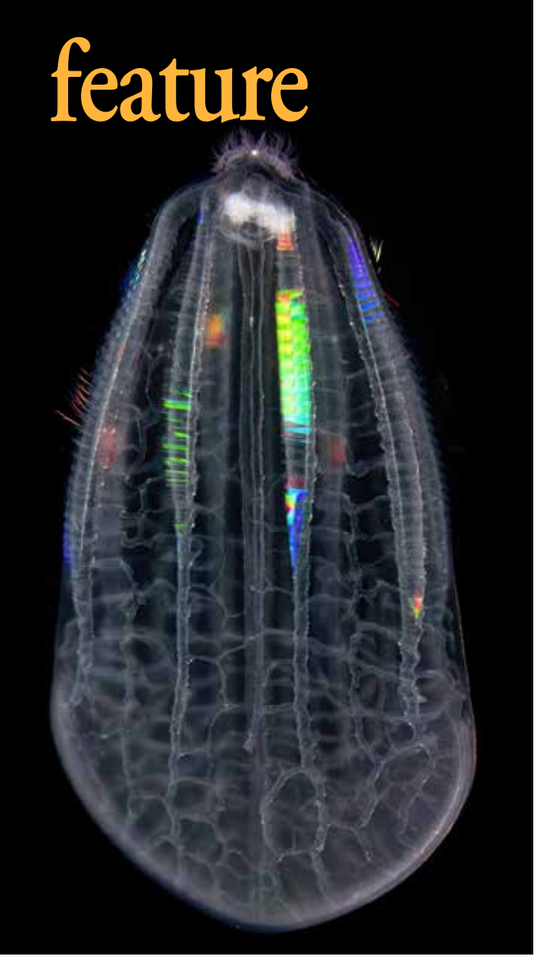
Those images may look effortless. But, with no reef or bottom providing a visual reference, good buoyancy and situational awareness are essential. For photographers, precise control becomes even more important. Many subjects are tiny, constantly moving and suspended in three-dimensional space. There is nothing to kneel on or nothing to stabilise yourself against. A poorly controlled fin kick may be all it takes to lose the animal you were trying to photograph.

Blackwater diving is therefore best suited to divers who are already comfortable underwater at night and confident in their buoyancy—although it has its own learning curve. With every dive, moving through open water and approaching its inhabitants becomes more intuitive, leaving more attention for what brought us here in the first place—the search in the darkness for whatever might appear next.

Ascent

For tonight, however, that search was coming to an end. Eventually, my computer told me it was time to leave. I followed the illuminated line towards the surface. The darkness gradually gave way to reflections from the boat, until, moments later, my head broke through the water's surface and the lights of Cozumel reappeared in the distance.

Back on the boat, the excitement had not disappeared with the dive.



The rainbow colours of this comb jelly (top left) are created by light refracting through its beating rows of cilia rather than by pigments. A close-up of the argonaut on the siphonophore (top centre). A gibberfish (top right) drifts through the open Caribbean, one of many deep-sea fishes whose life cycle briefly brings them within reach of blackwater divers.

Everyone discovered something different, and stories were already being exchanged before the gear was even off. A squid, someone followed for several minutes. A larval fish, nobody could identify. Something strange that vanished before anyone else could see it. And, almost inevitably, the conversation turned to the next dive. That may be the real pull of blackwater diving. No matter what you have just seen, the darkness always seems to leave something undiscovered.

As we began the journey back to Cozumel, I found myself looking differently at the black water passing beneath the boat. A few hours earlier, it had seemed empty. Now, I could not stop wondering what was moving below us, unseen in the depths. By the time we reached the familiar reefs, and the lights of the island grew brighter, the reefs no longer seemed like the whole story.

Tomorrow, dive boats would once again carry visitors along Cozumel's walls to dive among turtles, rays and colourful fish. But somewhere beyond these reefs, when daylight disappeared and the Caribbean turned black, another ocean was waiting.

It was there all along. It simply needed darkness to reveal it. ■

SOURCES:

BGS PRESS. GEOCHEMISTRY AND 'SEA ELEPHANTS'. BRITISH GEOLOGICAL SURVEY. 2018.

BOK M. DID PHRONIMA INSPIRE THE DESIGN OF THE ALIEN QUEEN? ARTHROPODA. 2009.

BRIERLEY AS. DIEL VERTICAL MIGRATION. CURRENT BIOLOGY. 2014;24(22), R1074–R1076.

HAYS GC. A REVIEW OF THE ADAPTIVE SIGNIFICANCE AND ECOSYSTEM CONSEQUENCES OF ZOOPLANKTON DIEL VERTICAL MIGRATIONS. HYDROBIOLOGIA. 2003;503(1–3), 163–170.

O'DWYER K. MEET PHRONIMA, THE BARREL-RIDING PARASITE THAT INSPIRED THE MOVIE ALIEN. THE CONVERSATION. 2014.

VAUGHAN A. THIS TERRIFYING PARASITE BEARS AN UNCANNY RESEMBLANCE TO THE QUEEN IN "ALIENS". SMITHSONIAN MAGAZINE. 2014.

FACT FILE: COZUMEL, QUINTANA ROO, MEXICO

BEST TIME TO VISIT: Blackwater diving is offered year-round. The calmest conditions are generally found from May to September, although sightings vary throughout the year.

WATER TEMPERATURE:
26-30°C (79-86°F)

VISIBILITY: Typically, 20-40m, although visibility varies depending on plankton density and sea conditions.

DIVE TYPE:
Blackwater / Pelagic Night Dive

MAXIMUM DEPTH:
Approximately 20m (60ft)

AVERAGE DIVE TIME: 60-90 minutes

EXPERIENCE LEVEL: Advanced Open Water or equivalent, with comfortable buoyancy and previous night diving experience recommended.

HIGHLIGHTS: Larval reef fishes, juvenile deep-sea fishes, *Phronima*, siphonophores, comb jellies, squid, pelagic crustaceans, transparent eel larvae, *Phyllosoma* lobster larvae.

MARINE LIFE: Every dive is different. Encounters may include juvenile tripod fish, anglerfish, gibberfish, sea angels, argonauts, flounder larvae, cephalopods, jellyfish, ctenophores and numerous other pelagic organisms.

PHOTOGRAPHY: Blackwater diving offers exceptional macro photography opportunities. Fast autofocus, a powerful focus light and good buoyancy control are essential for photographing small, constantly moving subjects.

OPERATOR: Blackwater Cozumel, operated by Robert Stansfield

EQUIPMENT: Dive computer. Macro camera setup recommended for photography

GETTING THERE: Cozumel is easily reached via Cozumel International Airport (CZM), or by ferry from Playa del Carmen on Mexico's Yucatán Peninsula. ■