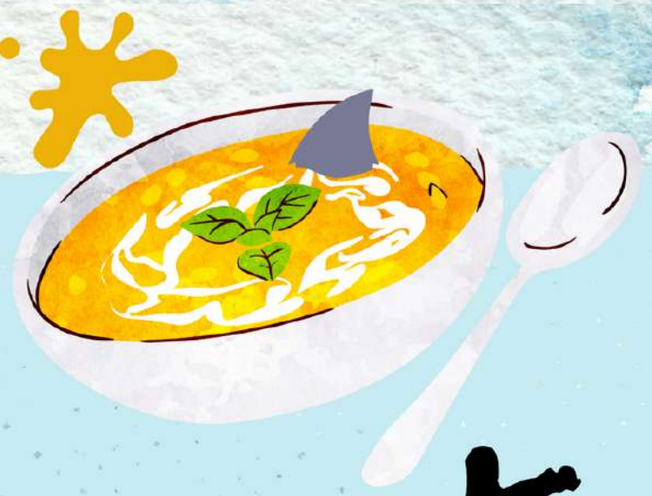
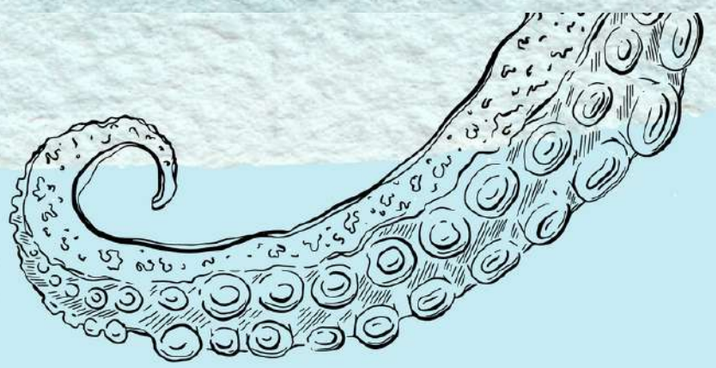
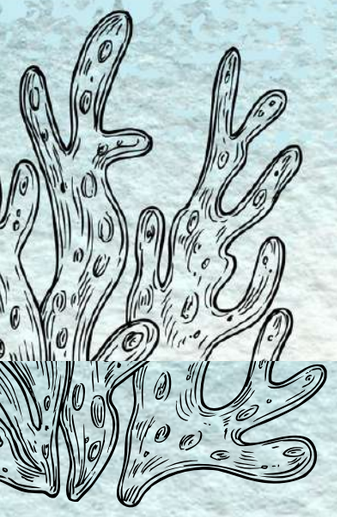
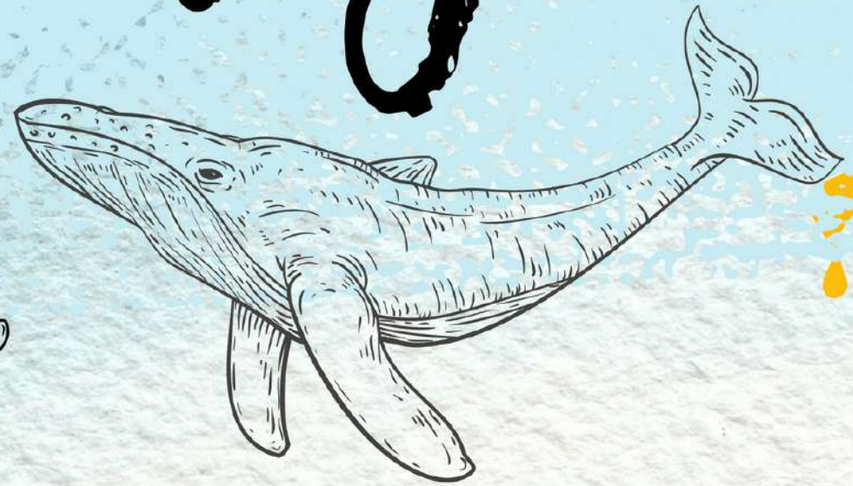




July 2023

not just soup





shark stories,
turtle tales
& more...

Issue 3

Dear Reader,

I have been thinking lately of the many mystical wonders of the ocean. While we humans have to resort to chemical mixes and party tricks for a serotonin boost, the oceans have some startling and enchanting phenomena that can give you an organic one! Ending up binging on alcohol (*woefully unmindful of the aftermath*), and throwing it all out of our system two hours later isn't exactly unusual. But you know what is? Sperm whale vomit. Yes, we even refer to it as 'treasure of the sea' and 'floating gold'! To know why, check out the *Pearls of Fishdom* in this issue...

This isn't the only astonishing sea feat I'm talking about...

Some humans are visited monthly by the red tide (*along with painful cramps*) but it is alarming when it occurs in the ocean! For this red tide is actually an algal bloom that spills toxins and spells disaster for the ecosystem while looking like a glam red-carpet event. We are familiar with fluorescence (*cue: disco balls and neon signs in nightclubs*), but what about bioluminescence? Witnessing the sea sparkling in blue and green at night without the effect of drugs is definitely a transcendental experience! Or take the elaborate mating rituals of the pufferfish; this tiny guy creates underwater ornate symmetrical crop circles to impress his potential mate. Rather unsurprisingly, it was once mistaken to be the work of aliens (*funny how we have more faith in other-worldly folks than in our own*).

We hope to discuss more such wonders of the marine world through our issues. Meanwhile, what do you think about these phenomena, and which one fascinates you the most?

“Deeply hypnotic are the songs of the mystic sea
They leave me wanting more, and yet feeling free
And when the night comes, the sea sparkles and glows
I wish to become one with the ocean and this,
the universe knows”

~Debangini

Know Your Shark

Great hammerhead (*Sphyrna mokarran*)

~*Garima Bora*

Image: Dhritiman Mukherjee

A solitary, nomadic, coastal and semi-oceanic pelagic shark, inhabiting tropical and warm temperate seas, the great hammerhead is not only an apex predator but also the largest species of hammerhead shark with an average length of 15 feet, sometimes reaching up to 20 feet!

With a long lifespan of up to 44 years, it breeds only once every 2 years and also faces high bycatch mortality, which makes it a critically endangered species (*as declared by IUCN*). The great hammerhead is a migratory species that is known to travel great distances up to 1200 km. Its diet ranges from crustaceans and cephalopods to even smaller sharks and stingrays. Although potentially dangerous, the great hammerhead rarely attacks humans and can sometimes behave inquisitively toward divers.

Did you know?

It can be distinguished from other hammerheads by the shape of its 'hammer', known as cephalofoil and by its tall, sickle-shaped first dorsal fin (which is longer than its pectoral fins). The shark's long dorsal fin extends its "wingspan" and gives it extra swimming space when tilted to one side. It also helps them swim sideways, which saves them at least 10% of their energy!

Sources:

1. Royer, M., Maloney, K., Meyer, C. et al. Scalloped hammerhead sharks swim on their side with diel shifts in roll magnitude and periodicity. Anim Biotelemetry 8, 11 (2020). https://doi.org/10.1186/s40317-020-00196-x
2. Rigby, C., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M., Herman, K., Jabado, R., Liu, K.-M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R., & Winker, H. (2019). Sphyrna mokarran-Great Hammerhead. The IUCN Red List of Threatened Species 2019. https://doi.org/10.2305/IUCN.UK.2019-3.RLTS.T39386A2920499.en

Researcher's Isle

Meet Tanmay Wagh

Tell us about your current work.

My work with Dakshin Foundation mainly involves coordinating the activities of the marine theme of the MoEFCC's Long-Term Ecological Observatories (LTEO) Programme in the Andaman Islands. I am also pursuing my PhD degree, for which I study the commercial small-scale reef fisheries in the Andaman and Nicobar Islands to understand how fisheries evolve in particular social and ecological settings and to propose ways in which high-value fisheries can be sustainably managed.

What has your journey been like till this point?

I did my graduation in Marine Biology and have been working in the Andaman Islands ever since. This has taken me on quite an exciting journey from studying dugongs, seagrass ecosystems, coral reefs and reef fish ecology to mangrove forests and elasmobranch fisheries. Diving underwater, walking amidst

mangrove swamps, struggling to identify species and having endless conversations with fishers over chai has been quite a rewarding experience! Along this journey, I got the chance to work with different organisations, learn from colleagues and make some great friends along the way. So, I'd say that it's been a precious journey so far!

What are some of the challenges you have faced along the way or continue to face?

Carrying out research in marine conservation can sometimes be a long and exhausting process. Spending months in the field often means missing out on important events and being far from loved ones. The excitement of working in remote ecosystems is also often marred by the logistic challenges of conducting research and the endless procedures for obtaining research permits.

Advice you would want to give to those who want a career in marine research and conservation...

Working in the field of marine research and conservation is not always rewarding with few and rare big victories. I think it is important to celebrate small victories and milestones. So, while there will be many rainy days affecting work (*literally*), it helps to look back on what drew us to these people, places and systems in the first place.

You can find Tanmay on Instagram @tanmaywagh and on Twitter at tanmaywagh5. You can also write to him at twagh.97@gmail.com

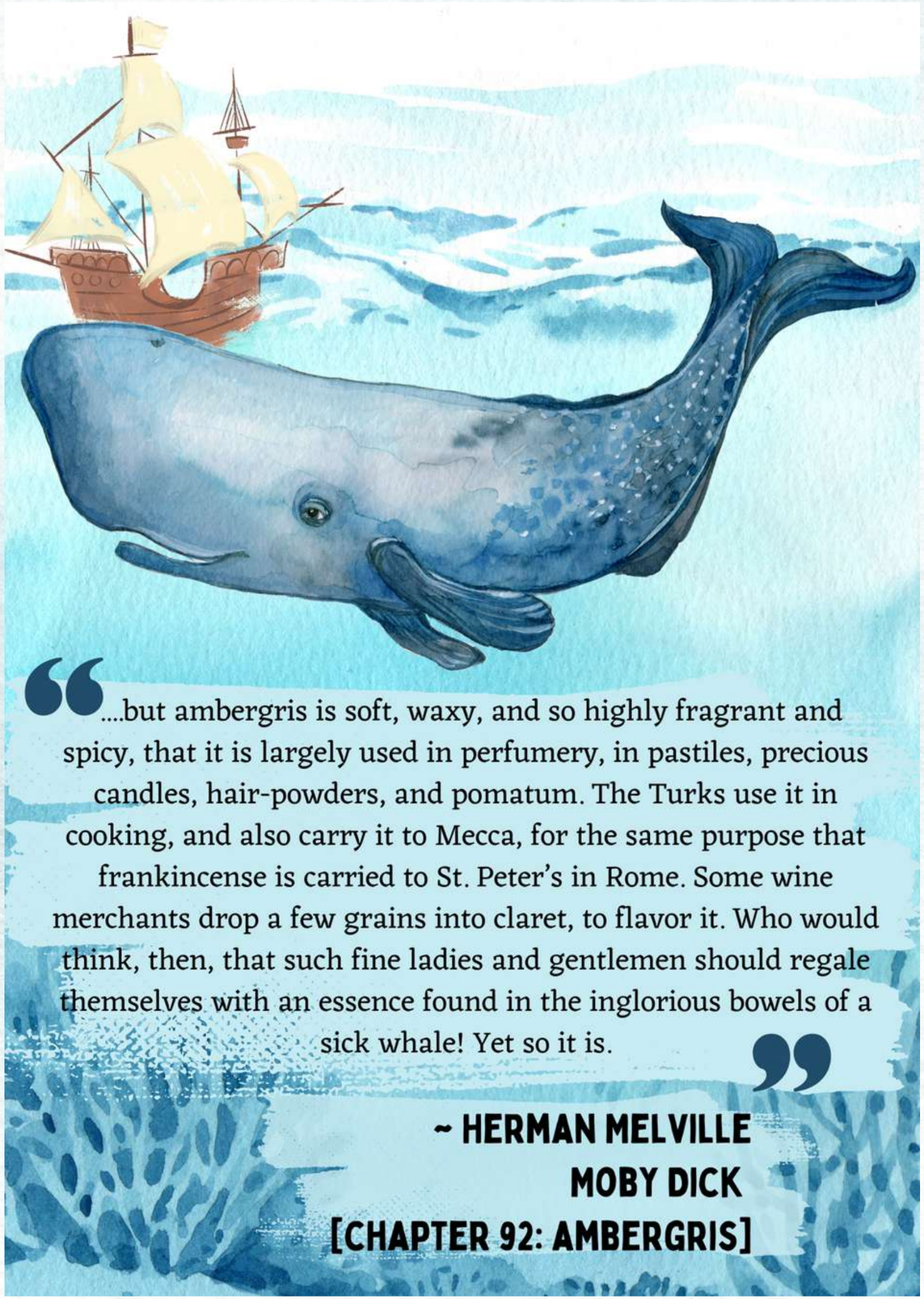
Pearls of Fishdom

Ambergris: the mistaken ambrosia!

We come across anything remotely mysterious and the human imagination starts solving it with its creativity rather than logic. Like how for a very long time, we thought that ambergris was hardened sea foam or the droppings of a very large bird. It was only when whaling began in the 1800s, that the true origin of ambergris was discovered- the sperm whale!

Ambergris is formed under very rare circumstances when the indigestible elements of the prey consumed by sperm whales (*which are normally vomited out before digestion*), move into the whale's intestines and bind together, slowly transforming into a solid mass which grows for many years inside the whale. It is widely believed that the whale regurgitates this mass, earning it its well-known nickname 'whale vomit'.

Its desperately sought-after tag makes one wonder if it has magical properties. Yes, if you're someone who's fond of perfumes. This curious lump of solid mass may not smell like your morning hazelnut cappuccino, but it contains an odourless alcohol called ***ambrein*** which is extracted to make a perfume's scent last longer. Early Arab civilisations named it **Anbar** and used it as incense, medicine and as an aphrodisiac to cure many ailments, including those of the brain, heart and senses.

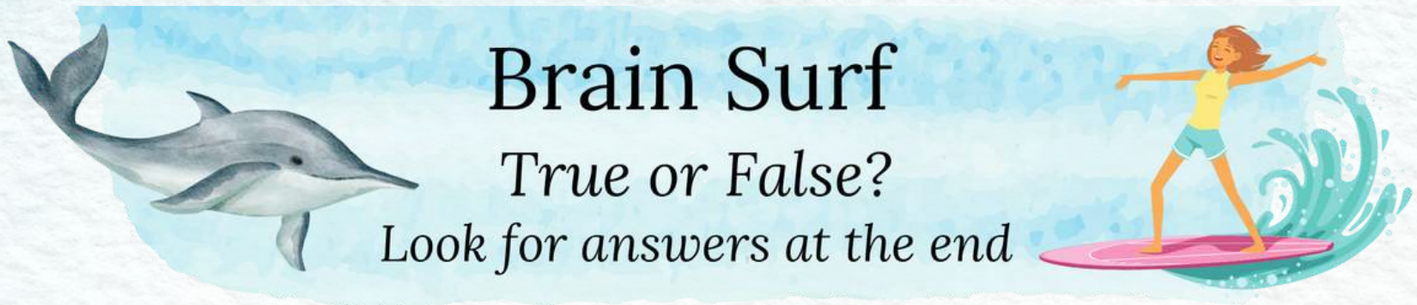


While the Convention on International Trade in Endangered Species (CITES), considers ambergris a waste product of sperm whales that occurs naturally, making it legal to collect it from the beach or sea, it has listed the sperm whale in Appendix I of CITES, restricting its trade until permitted under exceptional circumstances. The sperm whale is also a Schedule II species under the Wild Life (Protection) Act, 1972, which makes it illegal to sell, possess or trade ambergris in India.

In fact, two recent incidents of ambergris smuggling occurred in May this year, one in Karnataka and another in Tamil Nadu, where the people involved were apprehended and around 18kg of ambergris was seized in one of the busts! Yet in another interesting case this month, scientists on the Canary Island of La Palma, Spain, discovered 9.5kg of ambergris in a dead whale's intestines and have decided to sell it and donate the proceeds to victims of the island's volcano that erupted two years ago.

Sources:

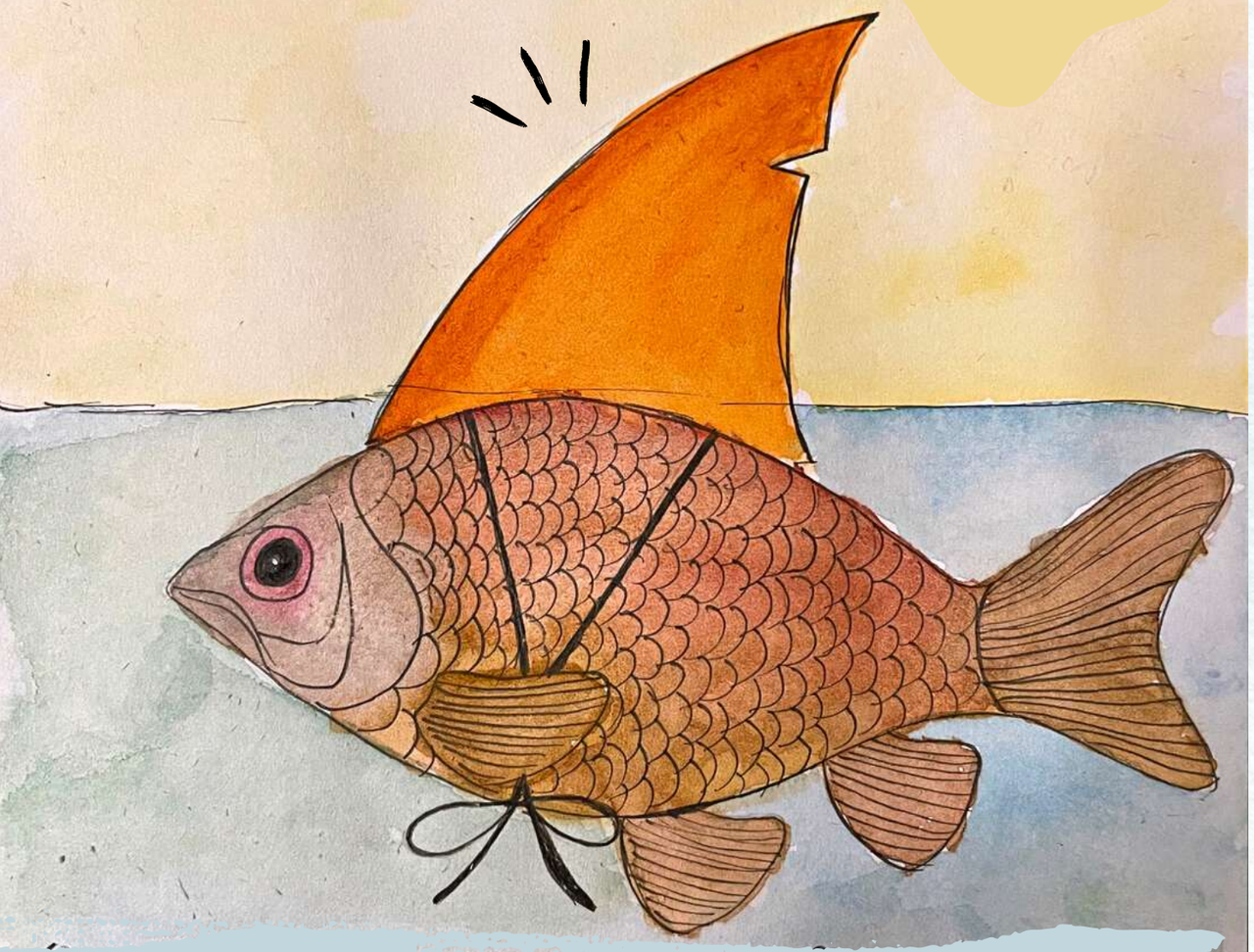
1. 3 Kerala men arrested in Karnataka for smuggling ambergris worth Rs 25 crore. (2023, May 24). The Indian Express. https://indianexpress.com/article/cities/bangalore/kerala-men-arrested-in-karnataka-for-smuggling-ambergris-worth-rs-25-crore-8625911/.
2. Burgen, S. (2023, July 4). Pathologist finds €500,000 'floating gold' in dead whale in Canary Islands. The Guardian. https://www.theguardian.com/environment/2023/jul/04/las-palmas-pathologist-ambergris-block-dead-sperm-whale.
3. Haider, T. (2023). Whale vomit worth Rs 32 crore seized from Tamil Nadu's Tuticorin coast. India Today. https://www.indiatoday.in/crime/story/revenue-dept-busts-ambergris-whale-vomit-smuggling-gang-racket-in-tns-tuticorin-coast-2382044-2023-05-20.
4. Kemp, C. (2012). Floating Gold: A Natural (and Unnatural) History of Ambergris. University of Chicago Press. https://press.uchicago.edu/ucp/books/book/chicago/F/bo13105586.html.



1. Bioluminescence in the oceans can only be caused by certain marine plankton.
2. The adductor muscle of the giant clam is considered a delicacy.

GOLDFISH UNDERCOVER

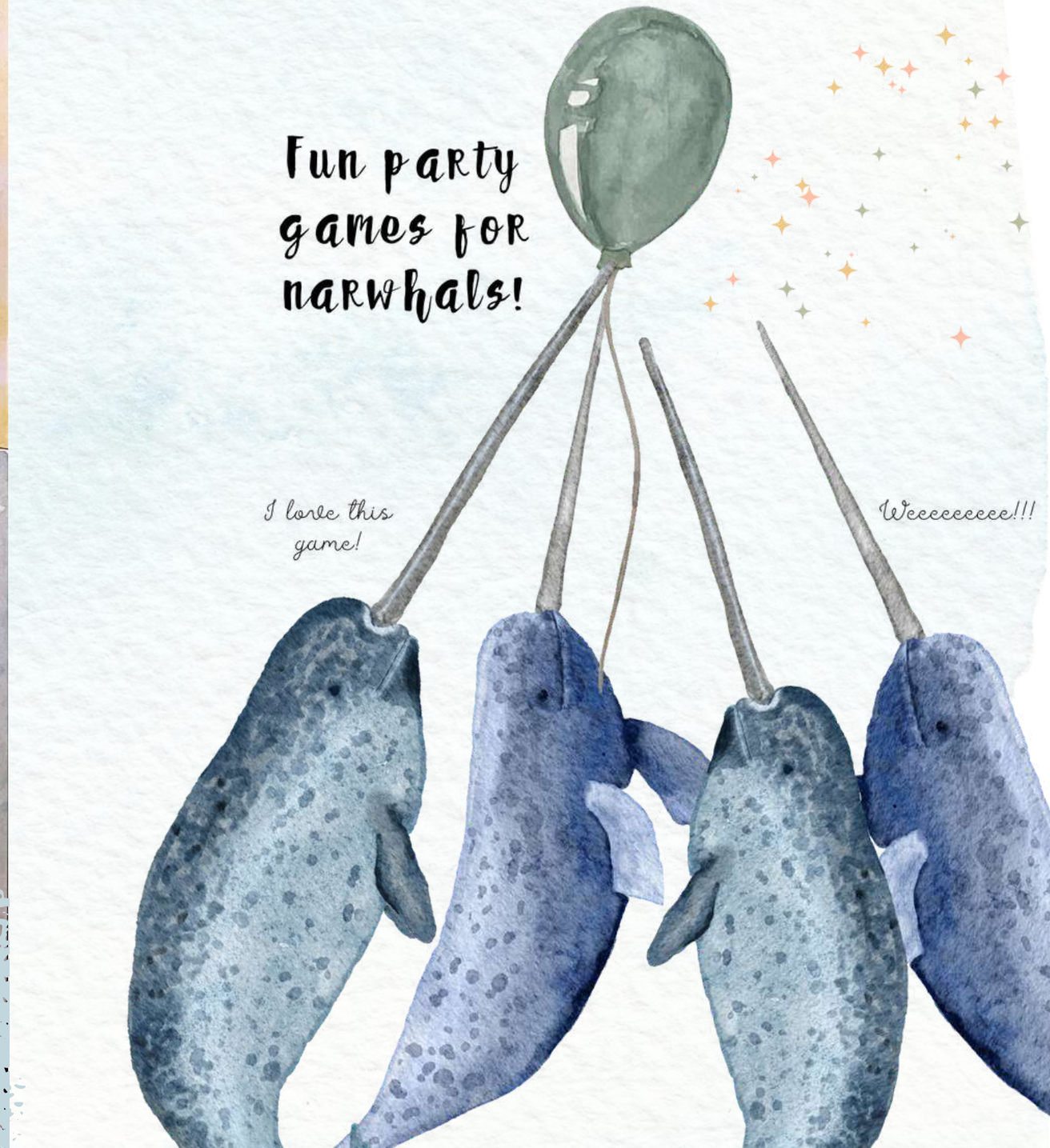
"Sigh! One of the cons of being a goldfish is that gold robbers are trying to kidnap me!"



"What an ingenious way to hide from the paparazzi"
~ The Daily Fish Post

Artwork: Debangini

Some puns have washed ashore

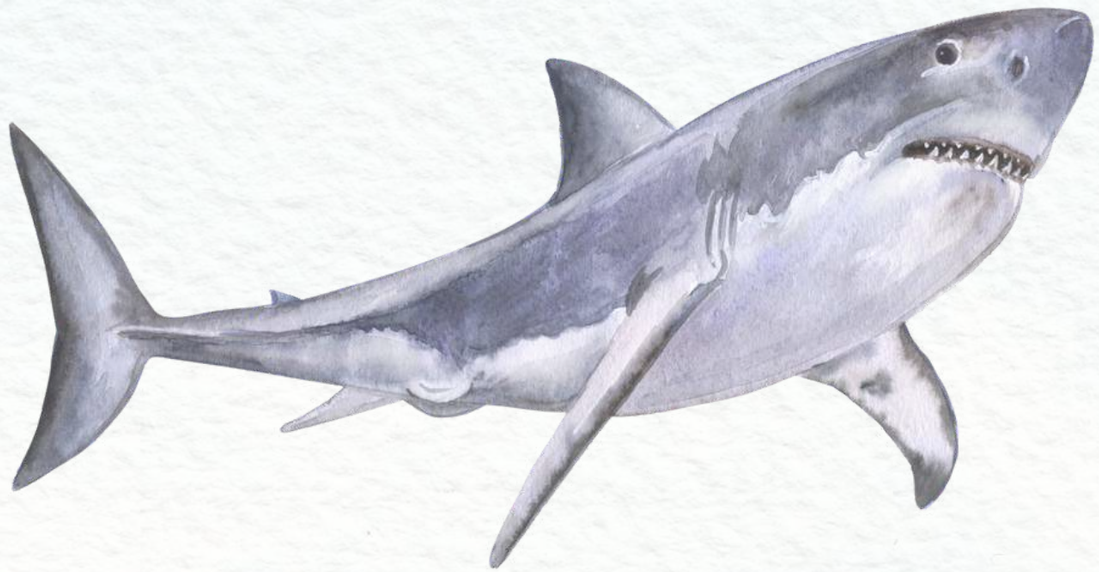


From the Galley

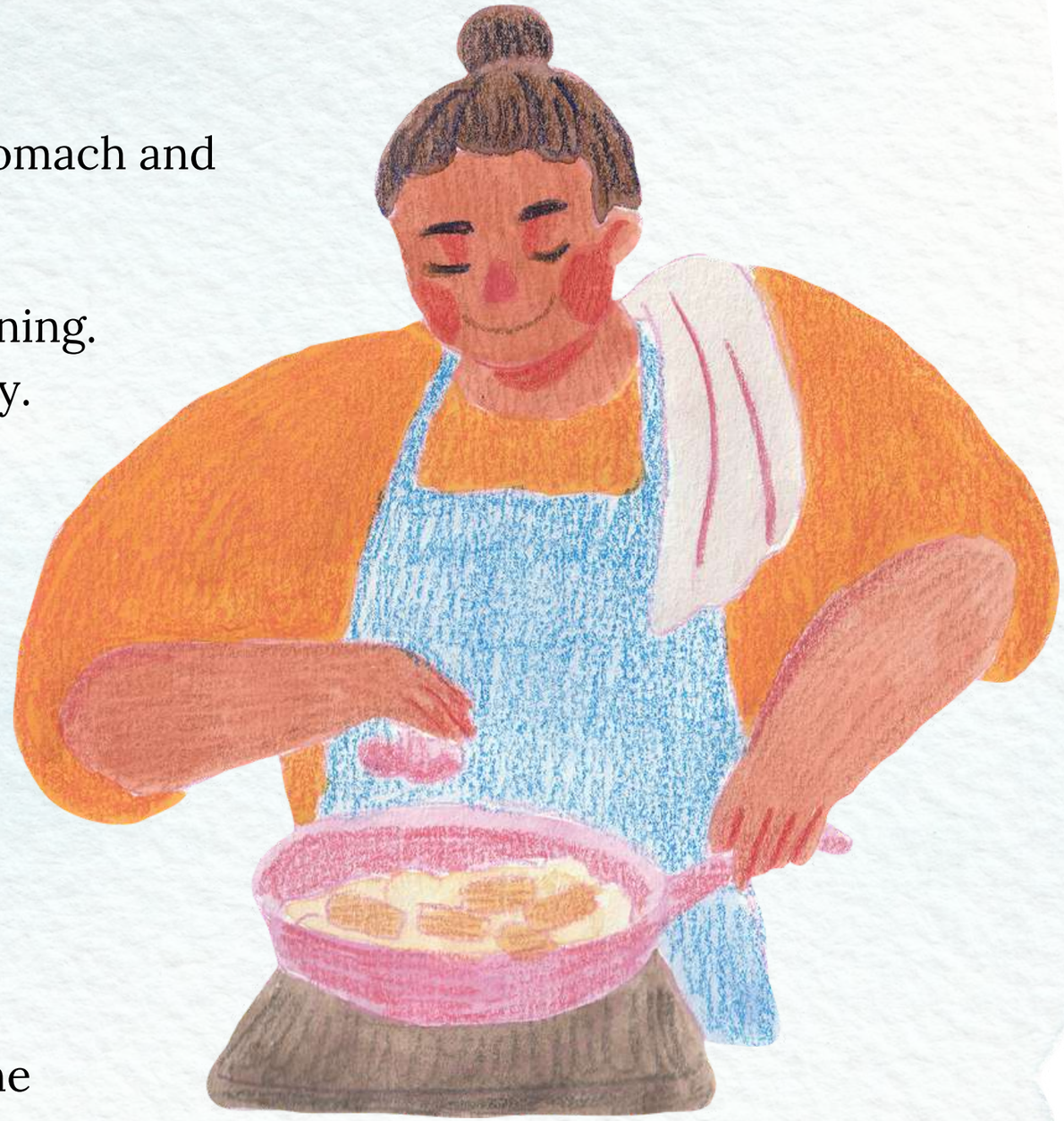
Shark Liver Pâté

The following extract has been taken from a website about authentic Māori culture and traditions. This is a recipe for preparing Kookii (*pronounced "core-key"*) which is made from the liver and stomach lining of a shark and was a part of the Māori ancestral traditional diet since kai moana (*seafood*) was in abundance.

"Preparing Kookii was another form of preserving food as it could hang for three days to as long as six months. It had to be cooked before eating and a favourite method was cooking it in a hangi (*pit oven*). The following steps describe how we were instructed by our kaumatua (*elders*) to prepare Kookii."



- Take one mango (*shark*).
- Cut down in front of the fin down towards the stomach and along the belly to expose the entrails (*guts*).
- Pull out and separate the liver and the stomach lining. Clean out and rinse the stomach lining thoroughly.
- Look carefully for a green pouch in the liver and remove it. If this is not removed the Kookii will be very bitter.
- Open the stomach lining and push in the liver until the stomach lining is full.
- Tie off with dried flax. Dried flax is preferable since the taste will be affected if fresh flax is used.
- Make sure that flax is fastened securely so that the pouch will not fall when it is hung.
- Fasten to a tree, or suitable place, facing towards the sun, which will help dry the Kookii. Can usually be cooked and eaten within three days or left to dry for six months.



Source: Rāhui o Aotea, M. (n.d.). Making Kookī. Aotea Harbour, Aotearoa-New Zealand. Retrieved July 11, 2023, from https://aotea.maori.nz/making-kooki

Sea Board

Environmental Engagement with Ganjam Kids!

The Marine Flagships team set up an environmental engagement stall for the kids at Ganjam, Odisha, as part of the Ultimate Frisbee sports event, where kids from the villages of Purnabandha, Podempeta and Nolia Nuagaon participated. We aimed at encouraging them to observe and learn about coastal and marine biodiversity in the region by introducing them to some of the local species and their biology through a fun and interactive display of posters, cards and preserved specimens. Despite the scorching summer heat, there was an air of excitement and we had to try hard to keep up with the energy and questions the kids had. The collective gasps as the team showed them specimens of crabs, oysters and rays, made it worth it!

At one point, one of our team members got momentarily overwhelmed by the huge crowd of kids. It was then that this kid (who had previously visited the stall) came forward to help her out and started explaining to the rest of the crowd whatever he had learnt. This was an incredible moment when we realised the enthusiasm and potential these kids had. Image: Garima Bora

Turtle Action Group (TAG) Meeting 2023

A Turtle Action Group (TAG) Meeting was held in Goa in the first week of July, which was attended by almost 60 member organisations working on sea turtle conservation, and marine and coastal protection across the country. TAG was formed in 2008 to enable organisations across the country to benefit from the pooling of resources and knowledge. TAG meetings over the years had established a set of goals, formed a core committee and held various capacity-building sessions as well as joint initiatives.

But this year was different.

TAG members met after a long hiatus and the network was revived to accommodate reforms in the functioning of the consortium for the future. The agenda for the meeting included guest talks, workshops and a plenary session. The topics ranged from reef conservation efforts in the Andaman and Nicobar Islands and coastal communities-based conservation to the best hatchery management and practices from across the world. A new data portal developed by Dakshin was also launched at this event.

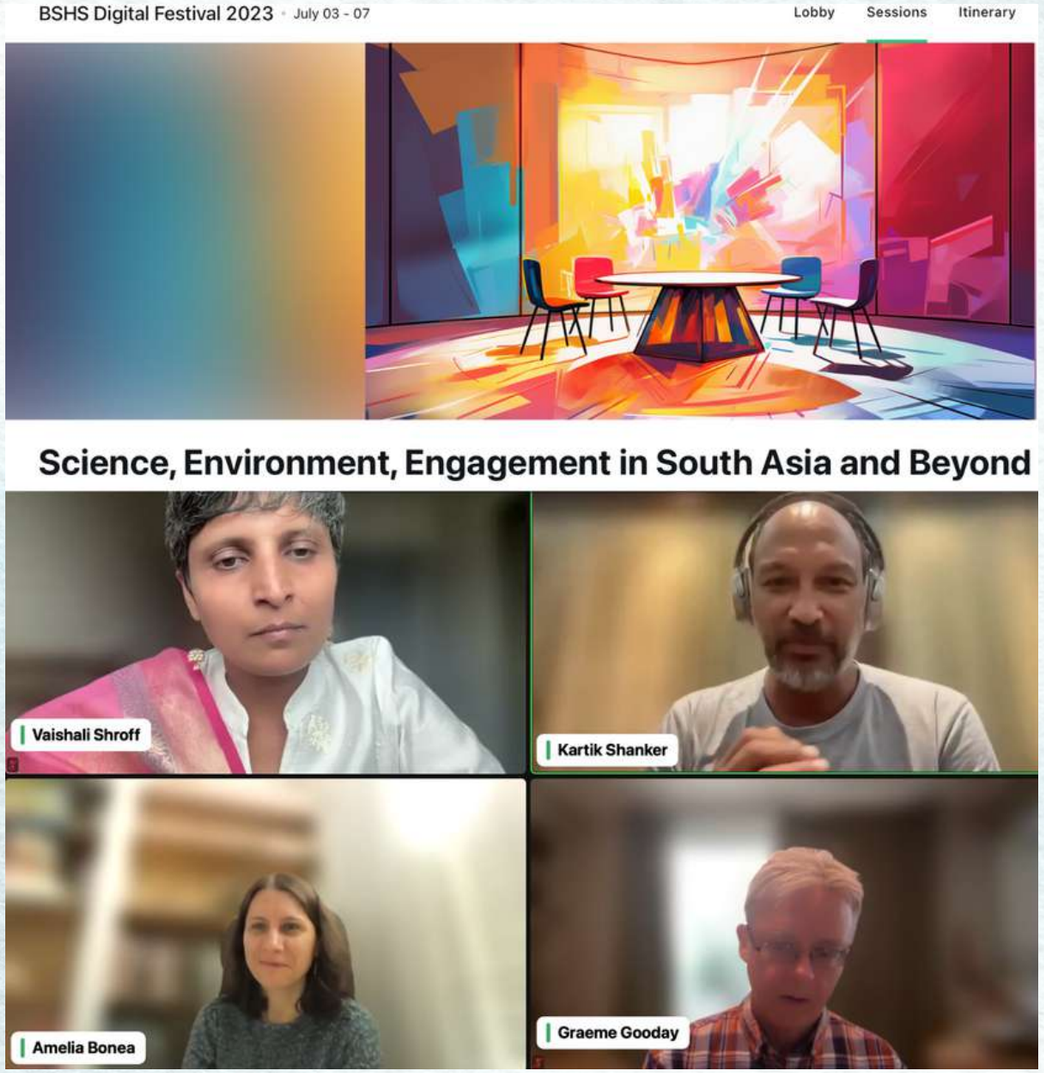
Going forward, Muralidharan Manoharakrishnan, who has been associated with TAG for a decade now, will be taking over the mantle of coordinating activities for TAG with his team at WWF-India, while Dakshin Foundation will continue to remain available to provide support for all future TAG efforts.

TAG started with 23 member organisations and has grown to a network of 35, but not without its fair share of bumps and failures. Image: Tanuj Mark.

Other Updates

- Watch the World Sea Turtle Day special online webinar, 'Community in Sea Turtle Conservation': Perspectives from The Global South, organised by the Olive Ridley Project, Maldives, where Kartik Shanker was invited as one of the speakers to share his stories on locally empowered participative sea turtle conservation.

- Read about the Leviathans of the Andaman and Nicobar Islands in Sanctuary Asia magazine, beautifully penned down by Kartik Shanker and Adhith Swaminathan.



- Dr Kartik Shanker was invited as a speaker for the session 'Science, Environment, Engagement in South Asia and Beyond' at the Digital Festival of Science, UK.
- Congratulations to our teammate Garima Bora who became the recipient of the Small Projects Grant, Inlaks Ravi Sankaran Programme, for her project on elasmobranch nursery habitats in Sindhudurg, Maharashtra!
- Check out the book 'Conservation through Sustainable Use: Lessons from India', and if you do, don't forget to read the chapter 'Counting to conserve: The role of communities and civil society in monitoring marine turtles' by Kartik Shanker and Muralidharan Manoharakrishnan.

ECOLOGY, CONSERVATION & FIELD BIOLOGY > **RECIPIENTS INLAKS RAVI SANKARAN PROGRAMME**

SMALL PROJECTS GRANTS

Name: Garima Bora
Project: ElasmoSearch: Investigating elasmobranch nursery habitats for conservation and management, Malvan, Sindhudurg, Maharashtra

Straight from the field

Nightlife at Agatti

~Hariprasath R

As night creeps over the Lakshadweep archipelago, the lights turn on in the eastern jetty of Agatti Island. The jetty, which juts out for about 300 metres from the shore, is a place where cargo and passenger ships dock. From fishing to unloading essential cargo, the jetty can sometimes be a hive of activity at night. Balls of light from the jetty reflect as halos in the surrounding water, attracting an interesting nightlife. The light illuminates the otherwise invisible invertebrates in the surrounding waters and offers a buffet for predators like green and hawksbill turtles. Some hawksbills even try to sneak away with the cuttlefish caught by fishers! Green turtles mostly feed on seagrass in Lakshadweep, but it appears that they don't say no to some easy midnight snacks.

Image: Hariprasath R

Making Waves

News from the coasts

1. The Great Atlantic Sargassum Belt is the world's largest brown algae bloom, that absorbs carbon dioxide and provides a rich marine habitat. It was once 5,000 miles long and visible from space but has virtually disappeared from the Gulf of Mexico, leaving local scientists searching for answers. Read about this intriguing phenomenon here.

2. According to a new study, the annulated sea snake appears to have evolved to see an extended palette of colours after its ancestors lost that ability in response to changing environments. Read the report here and check the published paper for a more in-depth read.

3. A breakthrough study finally reveals the unique evolutionary journey of the elusive pygmy right whale. Find the paper here.

4. The waters in the tropics have turned green, particularly in the southern Indian Ocean, and climate change is to blame according to a recent study. The green hue comes from chlorophyll which helps phytoplankton make food. A change in colour due to an increase or decline in the population will impact organisms that feed on plankton.

Watch a little spider crab piggybacking on a larger spider crab for its defence, in this video.

SEAmbiosis

Cleaning Stations

Even marine folks need a spa!

Care for a spa? Who doesn't? Some fishes excel at giving this service to their fellow marine-zens for a minimal fee!

These underwater cleaning stations are hosted by coral reefs, where the 'cleaner' fishes provide 'cleaning services' to client marine creatures that need to scrub off parasites from their bodies. Most of these cleaners are wrasses and shrimps. Clients range from smaller fishes like parrotfish, pufferfish and groupers to larger folks like sea turtles, sharks and manta rays. What's their fee, you ask? The cleaners get to eat the parasites which they scrub off. A fair trade if there was one. Now comes the tricky part- how far can you trust the client to not eat you up after the job is done? As is true with all businesses, cheating is rampant here too. While the cleaner fishes are usually in no danger, the occasional ravenous client will swallow the service giver after the service is rendered!

Image and source: Umeed Mistry

Reef Logbook

Keep calm and meet the Giant Clam

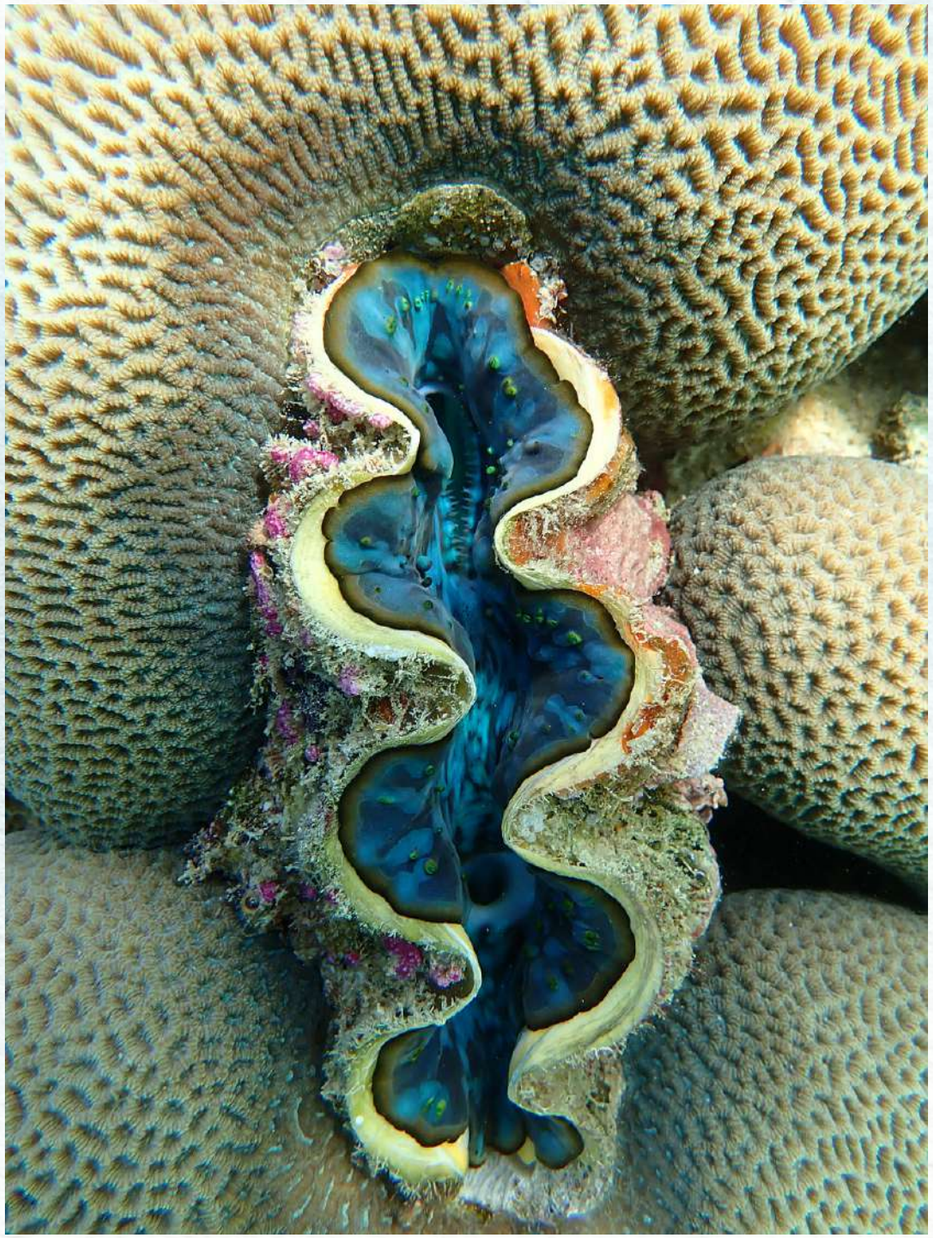


Image: Canva

The giant clam (*Tridacna gigas*) is a carnivorous invertebrate that grows up to 4 feet in length and weighs more than 200 kg (500 *pounds*), making it the largest mollusc on the planet!

It has algae living in its tissues to thank for its gigantic size, which produces sugars and proteins. The interesting thing about the giant clam is that it gets only one chance to find a nice home; once it fastens itself to a spot on a reef, it will sit there for the rest of its life (*which can be up to 100 years*)! It can be found in the warm waters of the South Pacific and Indian Ocean.

It has been declared 'Vulnerable' by the IUCN, as its numbers are substantially decreasing due to its adductor muscles being considered a delicacy.

Source: Giant Clam. (2011, June 10). National Geographic. https://www.nationalgeographic.com/animals/invertebrates/facts/giant-clam

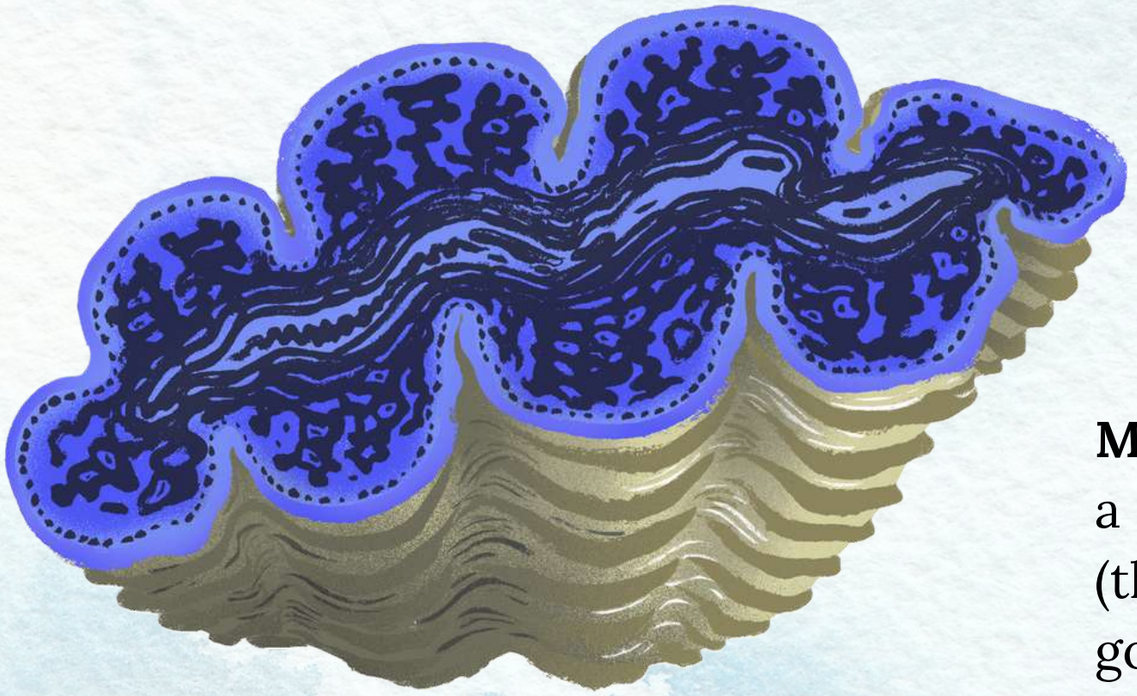


Illustration by Prabha Mallya

IF YOU WISH TO BECOME PART OF INDIA'S FIRST UNDERWATER CITIZEN-SCIENCE PROGRAM, JOIN US!

Myth buster: Some legends consider the giant clam to be a man-eater but the truth is that its adductor muscles (that are used to close the shell) move way too slowly to gobble up an unsuspecting diver fast enough! Moreover, there's been no account of human death by a giant clam to date.

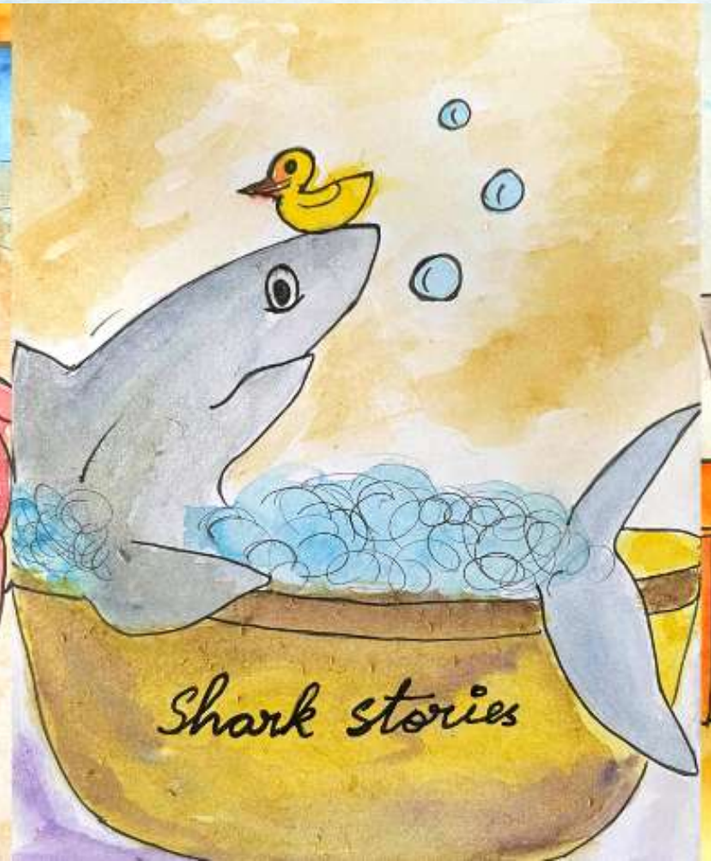
Answers to Brain Surf:

1. False. Bioluminescence or the ability of an organism to create light, is prevalent in the ocean and can be found in many marine organisms: bacteria, algae, jellyfish, worms, crustaceans, sea stars and fishes to name just a few. At least 1,500 species of fish are known to be bioluminescent, including sharks and dragonfish, and scientists regularly discover new ones.

2. True. The adductor muscle of the giant clam is actually considered a delicacy, and overharvesting of the species for food, shells, and the aquarium trade has led to a substantial decrease in its numbers and even led to regional extinctions. During the 1970s, most of the giant clams were harvested by over 50 countries in the Asia-Pacific region for the meat and aphrodisiac properties of the adductor muscle.

Don't forget to write to us!

Drop us an email with your feedback and suggestions.
Send us your artwork and articles on marine wildlife.
Share your work on marine research and conservation with us.
You may get featured in our next issue!



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