



RICHARD LING

The flamboyant parrotfish is a big part of what makes coral reefs so colourful.

A love story for the coral reef crisis

AYANA ELIZABETH JOHNSON shares why she is not yet able to give a happy ending to her story about parrotfish.

I want to tell you a love story. But, it doesn't have a happy ending. Once upon a time, I was a stubborn five-year-old who decided to become a marine biologist.

Thirty-four years, 400 scuba dives and one PhD later, I am still completely enamoured with the ocean. I spent a decade working with fishing communities in the Caribbean, counting fish, interviewing fishermen, redesigning fishing gear, and developing policy. I have been helping to figure out what sustainable management can look like for places where food security, jobs, and cultures all depend on the sea.

In the midst of all this, I fell in love. With a fish. There are over 500 fish species that live on Caribbean reefs, but the ones I just can't get out of my head are parrotfish. Parrotfish live on coral reefs all over the world, there are 100 species, they can grow well over a meter long and weigh over 20

kilograms, but that is the boring stuff. I want to tell you five incredible things about these fish.

Incredible parrotfish

First, they have a mouth like a parrot's beak, which is strong enough to bite coral, although mostly they are after algae. They are the lawn mowers of the reef. This is key, because many reefs are overgrown with algae due to nutrient pollution from sewage and fertiliser that runs off of land. And, there just aren't enough herbivores like parrotfish left out on the reefs to mow it all down.

OK, second amazing thing. After all that eating, they poop fine white sand. A single parrotfish can produce over 380 kilograms of this pulverised coral each year. Sometimes, when scuba diving, I would look up from my clipboard and just see contrails of parrotfish poop raining down. So next

time you are lounging on a tropical white-sand beach, maybe think of parrotfish.

Third, they have so much



NIKDAHL

A green sea turtle on a bed of sea grass in Hol Chan Marine Reserve in Belize, one of the Caribbean Sea habitats where Dr Johnson works.



OCEAN COLLECTIV

Ayana Elizabeth Johnson.

style. **Mottled** and striped, teal, magenta, yellow, orange, polka-dotted — parrotfish are a big part of what makes coral reefs so colourful. Plus, in true diva style, they have multiple wardrobe changes throughout their life. A juvenile outfit, an intermediate getup, and a terminal look.

Fourth, with this last wardrobe change comes a sex change from female to male, termed **sequential hermaphroditism**. These large males then gather harems of females to spawn. And, parrotfish exemplify some of the beauty of diverse reproductive strategies.

Fifth, and the most incredible, sometimes when parrotfish cosy up into a nook in the reef at night, they secrete a mucus bubble from a gland in their head that envelops their entire body. This masks their scent from predators and protects them from parasites, so they can sleep soundly. I mean, how cool is this?

So, this is a confession of my love for parrotfish in all their **flamboyant**, algae-eating, sand-pooing, sex-changing glory.

But, with this love comes heartache. Now that groupers and snappers are woefully overfished, fishermen are targeting

FAVOURITE SPECIES

Dr Johnson tells us why she loves the parrotfish. Underline the phrases in this story that sum up her five reasons.

Which animal or fish do you love the most? What are your reasons for loving that species?

My favourite species is the _____ because _____

parrotfish. Spearfishing took out the large species, midnight blue and rainbow parrotfish are now exceedingly rare, and nets and traps are scooping up the smaller species. As both a marine biologist and a single person, I can tell you, there aren't that many fish in the sea.

Saving the coral reefs

And then, there is my love for their home, the coral reef, which was once as vibrant as Caribbean cultures, as colourful as the architecture, and as bustling as carnival. Because of climate change, on top of overfishing and pollution, coral reefs may be gone within 30 years. An entire ecosystem erased. This is devastating, because hundreds of millions of people around the world depend on reefs for their nutrition and income. Let that sink in.

A little bit of good news is that places like Belize, Barbuda, and Bonaire are protecting these VIPs — Very Important Parrotfish. Also, more and more places are establishing protected areas that protect the entire ecosystem. These are critical efforts, but it is not enough. As I stand here today, only 2.2 percent of the ocean is protected. Meanwhile, 90 percent of the large fish, and 80 percent of the coral on Caribbean reefs, is already gone. We are in the midst of the sixth mass extinction. And we, humans, are causing it.

We also have the solutions. Reverse climate change and overfishing, protect half the ocean, and stop pollution running from land. But, these are massive undertakings requiring systemic changes, and we are really taking our sweet time getting around to it.

Each of us can contribute, though. With our votes, our voices, our food choices, our skills, and our dollars. We must overhaul both corporate practices and government policies. We must transform culture. Building community around solutions is the most important thing.

I am never going to give up working to protect and restore this magnificent planet. Every bit of habitat we preserve, every tenth of a degree of warming we prevent, really does matter. Thankfully, I am not motivated by hope, but rather a desire to be useful because I don't know how to give an honest talk about my beloved parrotfish and coral reefs that has a happy ending.

— Ayana Elizabeth Johnson is a marine biologist who works closely with coastal communities to take care of ocean life in sustainable ways. Dr Johnson gave this talk at a TED conference in 2019. Listen to her talk at: https://www.ted.com/talks/ayana_elizabeth_johnson_a_love_story_for_the_coral_reef_crisis

VOCAB BUILDER

pulverised (say "pal-ve-raiz'd"; verb) = crushed into small particles.

mottled (say "mo-tl'd"; adjective) = having irregular spots or patches of colour.

sequential hermaphroditism (say "si-kwen-shel her-ma-fro-di-tiz'm") = when an animal starts out as one sex and changes to the other sex later in its life.

flamboyant (say "flam-boi-yent"; adjective) = grand, colourful and festive looking.



MATTHEW FRADER

Coral reefs at the Arrecifes de Cozumel National Park, belonging to Mexico. Caribbean reefs like this are home to around 500 species of fish.

A BOOK YOU MAY LIKE

The courage to make a change

It has been a difficult morning for 12-year-old Amal. With her mother still unwell after giving birth, Amal has been managing the household chores as best as she can. While her father takes care of the farm, Amal has been busy minding her little sisters and doing the washing and ironing.

Amal has just finished her chores. She is looking forward to having some time to herself as she heads out toward the market. Making her way to the fruit and vegetable stall, Amal feels free. She knows the stall owner and many neighbours.

"Why are there so many people here today?" Amal asks a neighbour.

"New arrivals," the woman says, pointing to the pomegranates, apples, and coconuts for sale.

Amal spots a red, juicy pomegranate and picks it up. It is the last one. She has just enough money for this treat. She plans to share it with her sister.

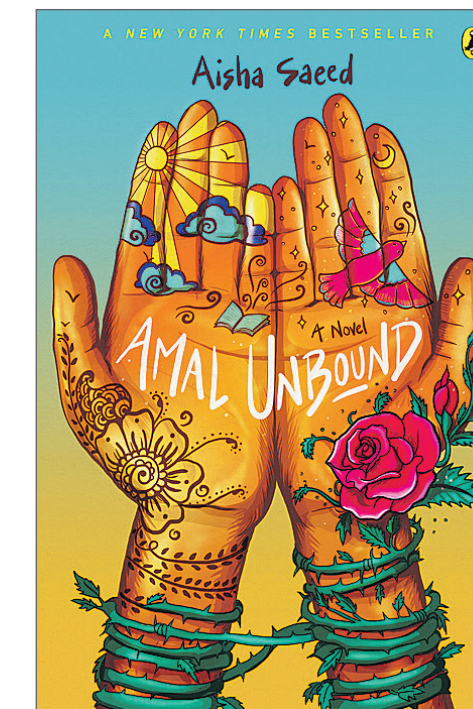
Lost in thought, Amal does not notice a shiny black car drive past as she makes her way out of the stall. She is knocked to the ground. The car stops, and a well-dressed young man steps out. This man is a stranger to her.

As Amal brushes herself off and picks up her belongings, the man says, "You should pay better attention." Amal notices that the man has her pomegranate. She snatches the fruit from his hand and walks quickly away. "Stop!" the man shouts. The crowd murmurs, but Amal does not stop.

This is how Amal ends up being a servant in the powerful Khan family's mansion. She had unknowingly insulted Jawad Sahib, the rich man's son, that afternoon at the market. As punishment, Jawad Sahib had forced Amal's father to send her to work for him.

Amal is not the only one there against her will. There is Nabila, whose father sent her there when he could not pay his debts to the Khan family. And, little Fatima, who is even younger than Amal.

The people in Amal's village live in fear of the Khans. Many who borrowed money from the Khans — to repair their roofs or to tide over a failed crop season — find themselves deep in debt. The Khans ruthlessly punish anyone who falls behind in repayment. And, nobody seems to be able to stop them.



Amal misses her family terribly. She learns the many rules of working in the Khan household. She keeps away from the volatile Jawad Sahib as much as she can.

One day, Amal comes across news that Jawad Sahib is being investigated for the murder of another rich man. The police comes knocking at the mansion, but they do not have enough evidence. One of the servants gives Amal a crucial piece of information that can help the police. But, is Amal ready to risk her own safety to stop the ruthless Khans? Will she have the courage to change the situation for her people?

Read *Amal Unbound* by Aisha Saeed to find out.

— Reviewed by NG SOCK LING

CONTEST

Amal is a servant in the powerful and cruel Khan family's mansion. One day, Amal reads news that a Khan is being investigated for the murder of another rich man. Another servant gives Amal crucial information that can help the police. Write a note to Amal, telling her what you would do if you were in her shoes.

1. Email your note to ourcontest@whatsup.sg.
2. Include your full name, class, and school in your email.
3. Contest deadline: 12 June 2020.

You could win a copy of *Amal Unbound!*



What's Up has teamed up with **TIMES READS** to bring you an interesting book each month. Every story deals with a value that you learn in your Character and Citizenship Education (CCE) class.