+ SCRAPBOOK | READERS-WRITERS | NEAR AND DEAR

gobar times

ISSUE NO: 235, November 1-30, 2021

A DOWN TO EARTH SUPPLEMENT FOR THE YOUNG AND CURIOUS

PHANTOM *PATAKHA*

As firecrackers blast
and leave you aghast,
Diwali can't outlast
the pollution soaring fast!

So, come and
resolve steadfast,
no crackers should
long last.
For our future
to recast,
may 'green' wishes
spread vast.

A GSP Primer

MANAGING SOLID WASTE IN SCHOOLS

Learn more about efficient solid waste management in schools and the journey to becoming zero-waste with this compact GSP reference resource designed exclusively for schools.

To know more, please write to the Green Schools Programme team at support@greenschoolsprogramme.org

gobar times

Green strokes

Revise and Revisit

In one of his landmark novels, 1984, George Orwell wrote, "Who controls the past controls the future: who controls the present controls the past."

The fireworks we burn to 'celebrate' Diwali is a case in point: how did this festival originate in the first place? We are told that when Lord Rama returned to Ayodhya after defeating Ravana, people decorated their homes with candles and lit firecrackers. That's how his victorious homecoming was celebrated as the festival of lights. Well, candles makes sense. But did the people of Ayodhya at the time of Lord Rama know about gunpowder?

We know that gunpowder is THE most essential thing for any firework to work. According to history, gunpowder was discovered in China and its earliest reference appeared in 1442 AD. This was during the Eastern Han dynasty, when the alchemist Wei Boyang wrote about it. Now, this is certainly much later than the time of Ramayana. Coming to the Indian context, it is the people from Central Asia who introduced gunpowder to India in as late as the sixteenth century.

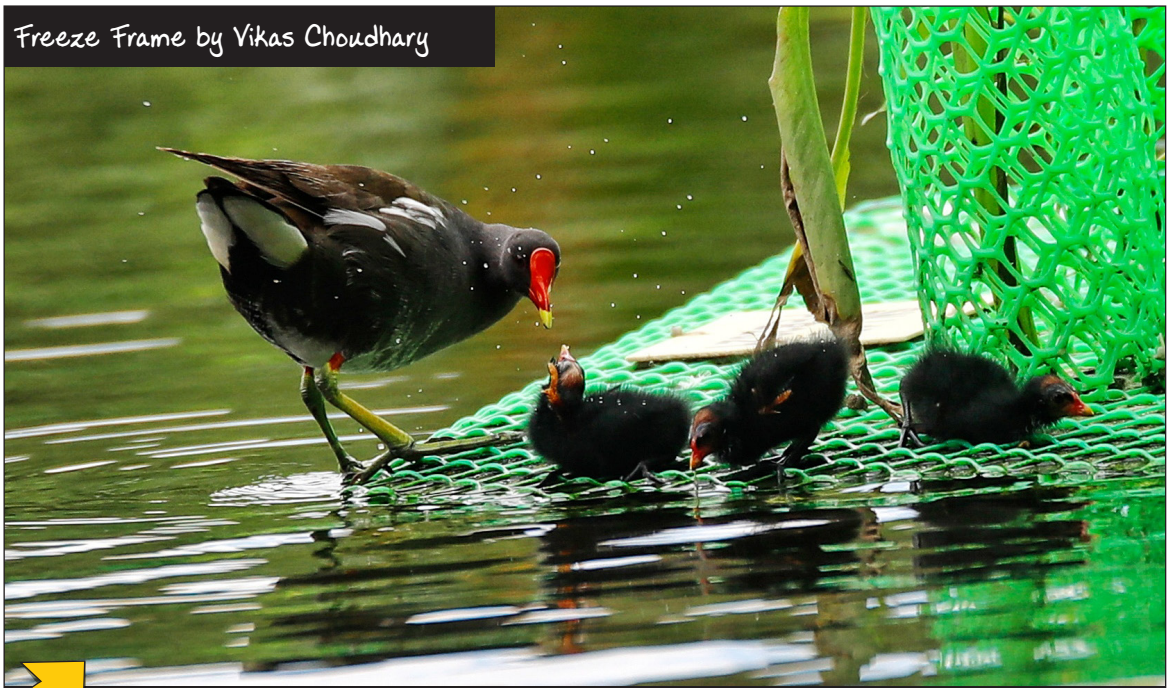
To cut a long story short, the use of fireworks for celebrating Diwali is a very recent phenomena. But, unfortunately, this is clubbed with some ancient mythical era. Owing to this distortion of history, firecrackers have become an integral part of our Diwali celebrations. Their results are also obvious. After every Diwali night, our cities turn into gas chambers. Air pollution skyrockets. Countless suffer and are hospitalised for respiratory ailments. All this, in the name of 'celebration.'

Want to get rid of the menace of fireworks? Correct your historical facts. Sometimes, to find solutions of present-day problems, we need to revisit the past. Until then, wish you a safe and prosperous Diwali!

Supplement Editor: Sorit Gupto **Creative Director:** Ajit Bajaj **Copy:** Anubhuti Sharma **Design:** Mukesh Kumar Singh
Illustrations: Yogendra Anand, Ritika Bohra **Cover Design:** Yogendra Anand **Production:** Rakesh Shrivastava, Surender Singh, Gundhar Das
Email: young@downtoearth.org.in **Snail Mail:** 41, Tughlakabad Institutional Area, New Delhi–110062

Scrapbook

Freeze Frame by Vikas Choudhary



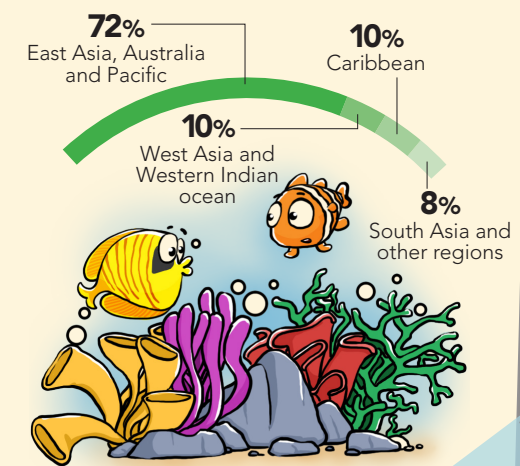
Feed the kid: A mother duck feeding her chicks at the Sanjay Van Lake, New Delhi.

This space is for young and budding wildlife photographers who wish to share their work with us!

Send us your best pics at young@downtoearth.org.in

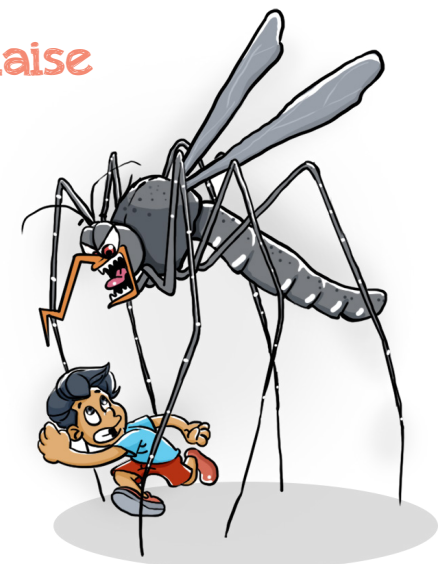
Digits speak

The coral cover of seas in West Asia and Asia-Pacific, comprising over half of the world's reefs, have seen a collective decline of over 80 per cent between 1987 to 2019. In contrast, reefs in the Western Indian and East Tropical oceans remain relatively stable, while marginally increasing in the Caribbean. Global reef distribution:



Source: *Status of Coral Reefs of the World 2020*, Global Coral Reef Monitoring Network

Malaria Malaise



Sub-Saharan Africa recorded a whopping 94 per cent of the global malaria cases and deaths until 2019, with children being the worst affected. Hence, the Malaria Vaccine Implementation Programme, a pilot project, was run in Ghana, Kenya and Malawi by WHO, UNICEF and other partners. They used a vaccine called RTS,S/AS01 (RTS,S) among kids and infants, which bore breakthrough results. It was developed after 30 years of medical research and is a first-ever anti-malaria solution approved by WHO. With its widespread use recommended across Africa, this long-awaited dose marks a great scientific triumph and a hope for the millions suffering.

Yogendra Anand/GT

Turmeric Treasure

The corona is a new virus which our bodies have no prior experience of dealing with. So, when it enters our body, our immune system gets hyperactive and triggers an inflammatory response called cytokine storm. This response can be self-damaging and, interestingly, curcumin, present in turmeric, is highly beneficial in treating this storm. Through some new farming methods developed recently, turmeric can retain more curcumin content compared to the traditional processing methods. These alternative methods also help farmers in using turmeric leaves for cooking, which reduces their wastage. Further, they are eco-friendly and are also raising the income of turmeric farmers.

Pioneering Physicist: CV Raman

(1888–1970)

Why the water, colourless in a glass, appears deep blue in an ocean?—asked and answered Sir CV Raman.

Born in 1888 in Tiruchirappalli, Chandrasekhara Venkata Raman was immersed into mathematics and physics under the influence of his lecturer-father. Academically bright, Raman won scholarships in school and a gold medal in physics from the Presidency College, Madras. He secured a distinction in the University of Madras and, in 1921, made his greatest scientific discovery during a defining ship journey.

Raman wondered, "Why is the sky blue?" His research on quantum nature of light was published in the *Indian Journal of Physics*, which he founded in 1926. He proved that diffraction of molecules of any medium—like air, water, etc.—causes light to shift its frequency. This causes light to scatter and makes the sky appear blue during daytime and red during sunrise. The National Science Day in India, celebrated on 28th February every year, commemorates this Raman Effect.

Keenly interested in music, Raman also investigated the harmonic nature of Indian drums. He established and chaired the Indian Academy of Sciences. In 1929, he was offered knighthood in Britain and in 1930, the Nobel Prize in Physics. Interestingly, he spent its prize money on purchasing and burning diamonds to learn why they scintillate. In 1954, Raman was conferred the Bharat Ratna.

In 30 to 100 years, depending on how much fossil fuel we consume, we will face a very significant climate change

Klaus Hasselmann,
winner of Nobel Prize for Physics, 2021

Compiled by Gargi Gupta and Anubhuti Sharma

Green School

Champions of Waste Management

Swearing upon the Waste Transformers Pledge to develop zero-waste practices

Tushita Rawat

India has more than 1.5 million schools and 260 million students. Think about a regular day in these schools before the pandemic. Imagine the amount of waste—food waste, plastic, paper, stationery—produced in these schools in a day. Now, add COVID-19 waste to it as schools across the country are reopening. Imagine all of this waste going to landfills. Alarming, isn't it?

Schools have a crucial role to play as waste generators as well as waste warriors, who manage all the solid waste they generate sustainably. The solid waste generated by schools is very different compared to that of other places such as restaurants. Plastic, paper, and food waste are some of the dominant wastes produced in a school.

Since schools have been clubbed with other bulk waste generators, they are responsible for managing their own waste, as per the New Solid Waste Management Rules, 2016. This solid waste is of the following types that must be managed scientifically and effectively.

- **Biodegradable waste or wet waste:** This is organic waste that is generated from natural things and can be consumed by animals. It is decomposed by microorganisms when put

in the soil. It includes kitchen waste, food waste, dry leaves, garden waste, flowers, etc.

- **Non-biodegradable waste:** This is an umbrella category for human-made waste items. They are mainly manufactured in factories. They cannot be consumed by animals and do not decompose easily on their own, though some of this waste can be recycled. These include paper, plastic, metal, glass and rubber, furniture, buckets, metal cans, ceramics, styrofoam, plastic bottles, shoes, cardboard, notebooks, newspapers, etc.

- **Domestic hazardous waste:** This refers to the waste items that are harmful and have an adverse impact on both the humans as well as the environment. These include broken glass, paint boxes and varnishes, mosquito repellant sprays and any pressurised cans, toilet cleaners, floor cleaners, etc.

- **Sanitary waste:** This refer to any waste item that has body fluids on it and carries pathogens. It includes soiled napkins, diapers, tampons, blood-soaked cotton, condom, used earbuds, and band-aids.

- **Biomedical waste:** This refers to the waste generated during the treatment of diseases, medical diagnostic processes, and immunisation. It includes apparatus like needles, syringes; human and animal anatomical waste; gloves, aprons, surgical masks, etc.

- **Electronic waste:** This waste category includes electronic and electrical products that are not working or are at the end of their life. For example: home appliances, mobile phones, DVDs, smartwatches, tube lights and bulbs, batteries, WiFi dongles, etc.

- **Construction & demolition waste:** This refers to the waste generated in construction and demolition activities. It includes concrete, bricks, plaster, stone, rubble, etc.

What should, then, the schools aim for to become model schools and set an example for all the other schools to follow? The answer—ZERO. Aiming to become a zero-waste school with the right practices is what will help most schools tackle this waste menace.

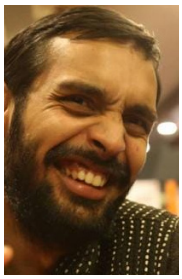
This is exactly what CSE's Green Schools Programme (GSP) network schools in India have pledged to do! The GSP Forum of Schools that Segregate, an exclusive community of schools that have benchmarked their waste generation and devised action plans to improve solid waste management, took the Waste Transformers Pledge in an online event.

The community has 126 registered member schools as of now. The students and teachers of these Forum Schools aim to become zero-waste generators in the next two years by implementing some action plans. These plans have been devised by the schools themselves by analysing their waste generation and recycling baselines, as well as the problem areas in and around the schools where these interventions are required.

The goal of the Forum is to build schools that are pioneers of waste management and serve as models for other schools to take inspiration from. You can also become a part of this change by adopting the Waste Transformers Pledge and its practices given in the posters below. To know more about the GSP Forum of Schools and its initiatives, please visit www.greenschoolsprogramme.org.

The author is Deputy Programme Manager, Environment Education Unit in the Centre for Science and Environment, New Delhi.

Cover Story



To Burst or Not to Burst?

The what, when, where, why, and how of our Diwali firecrackers

Avikal Somvanshi

'To burst or not to burst?' is a question many young humans might be asking as the *patakha* (firecracker) season begins. Teachers and doctors tend to advice against firecrackers but there's always a paan-chewing uncle or a macho friend who'll bully you kids into becoming enthusiastic arsonists. It's usually a tough choice to make. Some additional information is always a good help in firming up ones' resolutions. Therefore, let's throw some light on the history, chemistry, and eco-friendliness of *patakhas*.

Where have firecrackers come from?

Many historians believe that fireworks were originally developed around 2nd century BC in ancient China. Among the first, natural, so-called 'firecrackers' were bamboo stalks. When thrown in a fire, the hollow air pockets within the bamboo pipes would overheat and explode with a bang.

But the *patakhas* we know today are the products of some 10th-century Chinese alchemist, messing up with his/her cooking recipe. This person caused a blast by mixing potassium nitrate, sulfur, and charcoal. The resultant black, flaky powder became famous as 'gunpowder'. Soon, it was poured into hollowed-out bamboo sticks, and later into stiff paper tubes, forming the first human-made fireworks.

These dangerous yet sparkly inventions travelled through the Silk Route till Europe in the 13th century. And by the next two centuries, they were widely burst for religious festivals and public entertainment.

The *patakha* technology reached India by the 15th century. Their earliest mention is in the notes of Abdur Razzaq, the Timurid ambassador to the Vijayanagar Empire, in 1443 AD. He described how firecrackers adorned the Mahanavami celebrations in this south Indian empire. Later, the Mughals popularised them in north India but these were only for royal recreation.

Firecrackers embellished Diwali evenings not likely before the 18th century, when Maratha rulers organised firework shows for general

The Unsparkling Children of Sivakasi

Sivakasi is the biggest manufacturing centre of firecrackers in India. It came to global prominence in the 1980s as the world's largest concentration of child labor. A Government of India report found that out of a total population of 1,00,000 workers in the match and fireworks industries, the child-worker population is around 45,000, comprising mostly under-14 year olds. Forced to work with hazardous chemicals in unsafe conditions for inhumanly long shifts, the lives of these children was anything but sparkling.

Strict laws have reduced the number of children employed in these factories but have not managed to eliminate this menace completely. Their working condition still remains pathetic. In the past decade, at least 145 accidents have been reported in the firework units in Sivakasi and 20 workers also died earlier this year. These workers are compelled to slog for about 12 hours daily without sufficient breaks and are hired on measly wages. The occupational hazards of handling the highly inflammable ingredients that feed into fireworks without adequate safety gear is another major concern haunting these kids.

But all this tragedy continues unaltered, do you know why? Because the market demand for *anar* (flower pot), *chakri* (ground spinner) and *phooljadi* (sparkler) persists from children in the cities, towns, and villages across India.

public. Mass production of *patakhas* started only when the first fireworks factory was installed in Kolkata in the 19th century. But the real uptake on flashing fireworks took place after Independence. By the 1950-60s, India's firecracker manufacturing hub shifted southwards to Sivakasi in Tamil Nadu, which still continues to dazzle much of our festivities. To read more about the famous fireworks industry in Sivakasi, read the box given above.

Until the 1990s, the costliness of *patakhas* prevented people from buying them en masse for Diwali, Eid, or New Years. But as the old adage goes, 'excess of anything is bad,' when household incomes rose and firecracker vendors became a roadside phenomenon, the crackers quickly turned into a toxic addiction.

How toxic???

Firecrackers are basically a package of gunpower with additional metallic compounds to provide glitter to their smoke. Burning them releases toxic gases and particulate residues. These things are not good for your health or the environment. Multiple studies have established both short-term and long-term impact of inhaling these chemicals on humans, animals, and even plants. In humans, these range from irritation of eye, nose, and throat to severe development disorders among kids. Among adults, it can lead to serious complications with heart, respiratory and nervous disorders.

Overloading air!

If burst in a small quantity, the toxins released by firecrackers get diluted in the atmosphere, which reduces their adverse impact. But on festivals like Diwali when everyone blasts truck-loads of them that too simultaneously, then instead of dilution a cataclysmic concentration occurs. Simply meaning, too many pollutants get accumulated in the air in one place quickly.

Scientists studying air pollution on Diwali have found that carbon monoxide, a lethal gas, multiplies manifold above the safe-

standard prescribed by the government and WHO. Concentrations of sulphate, potassium, aluminum, sodium, and azide ions also shoot 2-5 times higher than normal on festival days. Particulate pollution, especially PM2.5 levels, skyrocket (pun intended) in Diwali's aftermath in most cities. (PM means 'particulate matter,' i.e. tiny dust. PM2.5 means particle measuring 2.5 micrometres, which is barely 3 per cent of your hair's diameter!)

Despite banning firecrackers, the daily PM2.5 levels in Delhi post-Diwali last year reached 440 $\mu g/m^3$ ('μg' means micrograms). This was almost 30-times the maximum daily exposure recommended by WHO. In fact, WHO says that our 24-hour average exposures should not exceed 15 $\mu g/m^3$.

The air in Delhi became so foul after Diwali 2017 that even birds dropped dead from the sky, indicating a warning from the heavens. This apocalyptic condition arose because of the cold and calm weather during November-December. Such weather traps pollution and spikes the toxin concentrations much more than what would happen during summer or monsoon.

What about the green firecrackers?

In 2019, the Council for Scientific and Industrial Research (CSIR) announced that it will develop 'green crackers' which will reduce particulate emissions by 30 per cent. Further, these crackers will produce the same light and sound effect as traditional fireworks do.

Now, this claim is dubious as there is no benchmark for how much particulates traditional fireworks emit to credibly measure any reduction in emissions. Not just that, this claim is also steeped in secrecy as CSIR signed Non-Disclosure Agreements with the *patakha* manufacturers before it shared its magic formula with them. Moreover, even if we assume that this formula is effective, a 30 per cent emission reduction is too little to drumbeat about given the pollution on Diwali, which exceeds the set standards by as much as 3,000 per cent!

Anyway, two years on, no scientific study has

Worst Cities to Celebrate Diwali

*(measuring PM2.5 level in $\mu g/m^3$)**

Rank	City	2018	2019	2020
1	Ghaziabad	442	414	509
2	Fatehabad		56	488
3	Hisar		257	467
4	Delhi	455	289	440
5	Jind		267	430
6	Noida	492	366	416
7	Bulandshahr	426	185	382
8	Bagpat	466	267	382
9	Faridabad	430	258	333
10	Rohtak	193	190	331
11	Bahadurgarh		166	324
12	Greater Noida	429	337	317
13	Moradabad	298	330	314
14	Lucknow	386	208	308
15	Sirsa		301	306

Air Data of Other Major Cities on Diwali

*(measuring PM2.5 level in µg/m³)**

City	2018	2019	2020
Gurugram	310	246	288
Amritsar	104	225	200
Ahmedabad	219	71	174
Agartala			158
Patna	277	245	157
Bhopal		80	121
Guwahati		195	115
Jaipur	101	211	107
Pune	146	69	103
Kolkata	240	123	89
Mumbai	124	57	78
Chandigarh		145	69
Hyderabad	64	60	57
Chennai	73	149	56
Bengaluru	62	44	27

* The tables above show pollution levels only for cities whose data is available. Higher the number, more toxic is the air. You could note that the 2019 PM2.5 levels are lower than that of both 2018 and 2020. This is because in 2019, Diwali was celebrated in October, when weather was not too cold; unlike in 2018 and 2020, when it was celebrated in November. Further, the 2020 pollution levels are lower than 2018 because of the corona lockdown implemented last year.

Source: Analysis by Centre for Science and Environment of realtime data provided by the Central Pollution Control Board.

What Makes a Firecracker Twinkle with Your Health?

- **Copper:** Irritates the respiratory tract.
- **Cadmium:** Leads to anemia by reducing the oxygen carrying-capacity of blood.
- **Zinc:** Causes metal fume fever and induces vomiting.
- **Lead:** Harms the nervous system.
- **Magnesium:** Causes metal fume fever.
- **Sodium:** Causes burns when combined with moisture as it is a highly reactive element.

confirmed their 'green' claims. Most likely, these crackers are only as green as the shiny green wrappers of the deafening Diwali bombs. Or as the US President Joe Biden says, "it's just malarkey!" (Psst: 'Malarkey' means non-sense).

Fire in the belly, not, sky

Festivals and celebrations are about having a good time with our loved ones. There is no need to torch the Nature to achieve this goal. Agreed, some people have been bursting *patakhas* for ages but these are the same people who burnt a hole in the Earth's ozone layer and catapulted our future into a climate crisis. Firecrackers are not only toxic to all lifeforms on this planet but also add to greenhouse gases that are causing global warming and climate change.

Gen-Z or Zoomers have already initiated a war against many oldies to save the planet through movements like *Fridays for Future* and *Youth for Climate*. Now, this begs the question: is it worth abandoning the fight for your future over a night of life-threatening razzmatazz?

Zoomers don't need to and should not follow the steps of Boomers. There are ample ways to celebrate festivals in a peaceful manner. Tell us your creative ideas on how you'd celebrate this year. Meanwhile, have a safe and happy diwali!

The author is Programme Manager, Clean Air Campaign in the Centre for Science and Environment, New Delhi.

For the Record

The Carbon Blues

Understanding 'blue carbon' and the importance of conserving our natural sinks

Gargi Gupta and Anubhuti Sharma

Carbon is a chemical element found widely in the universe. It is the basis of our life. But what about 'blue carbon'? Blue carbon is basically organic carbon i.e., something obtained mainly from decaying plant leaves, wood, roots, and animals. This blue carbon is captured and stored by coastal and marine ecosystems. Absorbing it is very important because as human activities are releasing a lot of greenhouse gases (GHGs), there is an excess of carbon accumulating in our atmosphere. This is causing global warming and the climate crisis, which is threatening our planet currently.

Our oceans, coasts, and forests naturally absorb or sequester the GHGs present in our atmosphere. Some of these forest areas have highly rich flora and fauna and are recognised as UNESCO World Heritage Sites. The Sunderban National Park in West Bengal is one such site, famous for its Royal Bengal Tiger. In fact, the Sunderbans is also among the top five sites with highest stocks of blue carbon globally.

As per a latest assessment by UNESCO, IUCN, and the World Resources Institute, ten out of 257 forest areas in these 'World Heritage Sites' released more such carbon than absorbing them! The total carbon stored till now by these forests is approximately 13 billion tonnes. If all this stored carbon were to be released, it would be akin to emitting 1.3 times the world's total annual CO_2 emissions from fossil fuels.

Each year, these forests absorbed approximately 190 million tonnes of carbon dioxide. But between 2001-2020, satellite-derived data and site-level information revealed that ten such forests, including the Sunderbans (see photograph above) released more carbon primarily due to human activity and climate change. These activities included land clearance for agriculture; severity of wildfires owing to droughts; and extreme weather phenomena, such as cyclones.

The study urged strong and sustained protection of UNESCO World Heritage Sites and their surrounding landscapes. This is needed to ensure that these forests continue to act as strong carbon sinks and stores for future generations. It also recommended an improvement in our landscape management policies to respond to climate change immediately.

A Manifesto from the Microbial World

A manifesto presented by the United World of Microbes to the United Nations of Humans

Avie Lal

At the outset, I want to thank the United Nations of Humans for giving us this opportunity to address all of humankind. I speak on behalf of the quintillion microbes of our planet.

I know that we are speaking to you in a time of great distress. Each of you present here has faced personal tragedies. We convey our deepest condolences.

It is heartbreaking that all of us microbes and viruses are reviled for the COVID problem. Let me remind you that this hatred is unfair.

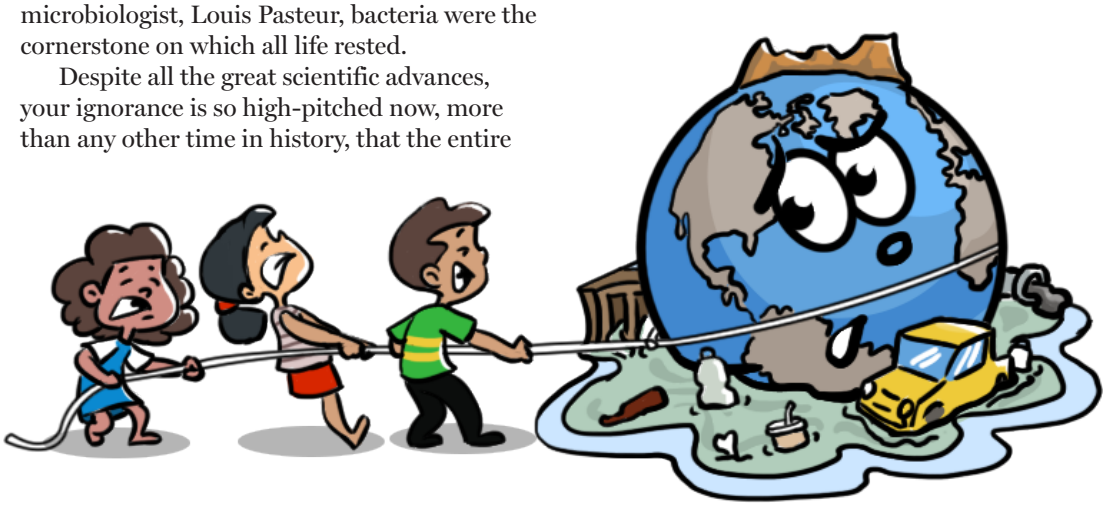
While this tragedy is caused by one of us, you must remember that not all microbes are against you. We continue to live peacefully alongside and within you, as we have for millions of years. Less than one per cent of us cause you diseases. In fact, a majority of us work dedicatedly in partnership with all of humankind, and the entire animal and plant world too. We are present in nearly every pore of your body, in every morsel of your food, and in every drop of water you drink. We are the engines of evolution and creators of all new lifeforms. We produce, process, breakdown, digest, ferment, reformulate, recycle and synthesise nutrients faster and more efficiently than any of your machines. We also work ceaselessly every second without expecting any rewards or recognition.

It won't be incorrect to say that you cannot survive even a moment without us. But, despite all our services, you persecute us. Your chemicals, antibiotics, soaps, and disinfectants constantly assault us indiscriminately. Most of you regard us as germs, bugs, critters. A few others see us as mere producers of your vitamins.

You treat us as second-class citizens in the Republic of Life. You want us to live only in ways that you prescribe. That's how you've systematically domesticated us. You cultivate us in your labs, alter our genes (sometimes forever), and put us through the drudgery of industrial processes. We don't mind helping you but your callous enforcement is destroying our habitats, including the ones inside your own bodies.

Each living being is important both as an individual and as species. We want to remind you that removing any single variety from Nature can be disastrous. Take the bees and ants away and most fruits and crops would perish. Eliminate fungi, the undertakers of all things dead, and you'll have rotting biomass, fewer medicines, and no specialty cheese. To the great microbiologist, Louis Pasteur, bacteria were the cornerstone on which all life rested.

Despite all the great scientific advances, your ignorance is so high-pitched now, more than any other time in history, that the entire humankind wishes all microorganisms to go extinct. But, if you were to actually do this, you'll be doing so at your own peril. We do not wish to engage in this unending internecine warfare.



The current crisis from our point of view is simply this: you believe that taking things out of Nature without replenishing it is good economics. By taking out more than giving back, you achieve what you call efficiency. You assign an arbitrary value to things based on what other humans would pay and sell them in markets for huge profits. The real cost of your profits is paid through the irreversible extermination of Nature. We microbes simply call this greed. Your factories eject weird things, we've never encountered. Your waste is equally a waste for us and is killing us as much as it's killing you.

The corona is the result of your misdeed. It is something that you've inflicted upon yourself. It's not a retaliation from us, microbes. Each crossover of a pathogen, which makes it a disease, is an indicator of how humans have overstepped their limits with Nature. When you destroy our homes, you compel us to find new ones. We reside in your lungs and guts accidentally and solely for self-preservation.

A newbie coronavirus started from an animal but passed through millions of your bodies. Its destructive journey exposed your frailty and artifice. It has shown the hollowness of your high offices and unsustainability of your consumerism. Each day of a mismanaged crisis has widened the fissures of your economic inequality and weakened the trust between your communities.

We, microbes, watch your world in dismay. We see lockdowns restricting individual freedom and authoritarianism doing away with liberal democracy. We are most sorry for the loss of all things you value. While we hope that you'll accept our sympathy, we wish that your discussions on environment and ethics don't dissipate. Let compassion, logic and science guide you.

Humanity arrived on this planet only a few seconds ago in the geological hourglass. I appeal, therefore, to every nation you represent to ponder upon your disrupted relationship with Nature before the consequences of your conduct become fatal and irreparable for everybody, including yourselves.

We can help you fix this mess. Just stop the rampant damming of rivers, obliteration of hills, extraction of minerals, and production of things that'll persist for a zillion years. Coming from the microbial world, I appeal this august assembly of humans to no longer ignore our warning.

The author is a student of class IX, Step by Step School, Noida.

Near and Dear

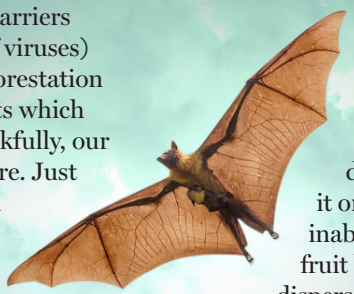
BATTING BETTER

Uncloaking the myths and mysteries of the Great Indian Fruit Bat

Gargi Mishra

Thanks to the real-life bat, the reel-life Batman became a superhero. I have vivid childhood memories of the trees near my school from which more bats hung than leaves. During summery dusks, they'd glide away en masse in a procession. I believe, even then as today, people would've been susceptible to the viruses spread by their droppings. But such cases were unheard of. Rather, people fed upon this fascinating creature to cure their ailments—like, rheumatism, asthma, and chest pain; and used bat hair to treat shivering during fever.

However, corona has vilified bats as the powerhouse of zoonotic diseases. Tigga Kingston, Co-Chair of the Bat Specialist Group dispelled this misconception in an interview published on *Down To Earth* website in May 2020. She said that by destroying their natural habitats, "We are breaking down barriers that normally prevent spillover (of viruses) from wildlife hosts to people." Deforestation immediately exposes us to the hosts which carry corona-like pathogens. Thankfully, our physical interaction with bats is rare. Just try to recall the last time when you spot that sole flying mammal. Contrary to a disease-laden vector, Kingston believes, "Bats are good at suppressing viruses and rarely show clinical signs of sickness even when infected."



Among the world's largest bats is the Indian Flying Fox—named due to its uncanny resemblance to a fox—or Greater Indian Fruit Bat. It inhabits the regions nearby waterbodies and human settlements in our subcontinent. It has a yellow-brown mantle, chestnut-brown underparts, and big eyes. The extension of a thin membrane from its toes to hands form its leathery wings.

Most of these vagabonds use sound, i.e., bio-sonar technology to detect preys. This technique is called 'echolocation'—locating using echos. But the Indian Fruit Bat depends on its strong sense of smell and vision to catch preys. It can see up to 1 kilometer at night and feeds upon fruits and nectar. Since it also damages large fruit farms as a consequence, it is rendered a vermin.

Interestingly, the fruit bat spits out its undigested fruit fiber, often misinterpreted as—defecation through mouth; blame it on its rapid digestive system or inability to digest fibers. Contrarily, fruit bats are great pollinators, seed dispersers, and pest-suppressors. A single fruit bat can disperse about 60,000 seeds per night. Can you imagine how genetically weak our forests would've been without them?

There's also a lucrative business of bat meat in several countries. But the bat population is threated mainly due to habitat-destruction caused by urbanisation and road-widening.

Thankfully, people like the Kabatabandha villagers of Odisha protect fruit bats. In Puliangulam in Tamil Nadu, the flying fox is considered sacred and is blessed by a local spirit called Muniyandi. To my great joy, the fig tree in front of my house in Delhi also shelters these nocturnal visitors.

The author is an amateur ornithologist and closely follows the avian world.

Ritika Bohra/GT

Latest research shows that the Earth may turn into a completely different planet by 2500. It will happen if the participating countries of the ongoing United Nations Climate Change Conference (COP-26) in Glasgow, UK remain unwilling to reduce their carbon emissions. The findings reveal that by 2500, global warming will render the Amazon rainforest barren and the American Midwest into a tropical zone. It will also make the Indian subcontinent too hot to be habitable and push up the sea levels by 50-feet, given the current pace of ice-melting in Antarctica.