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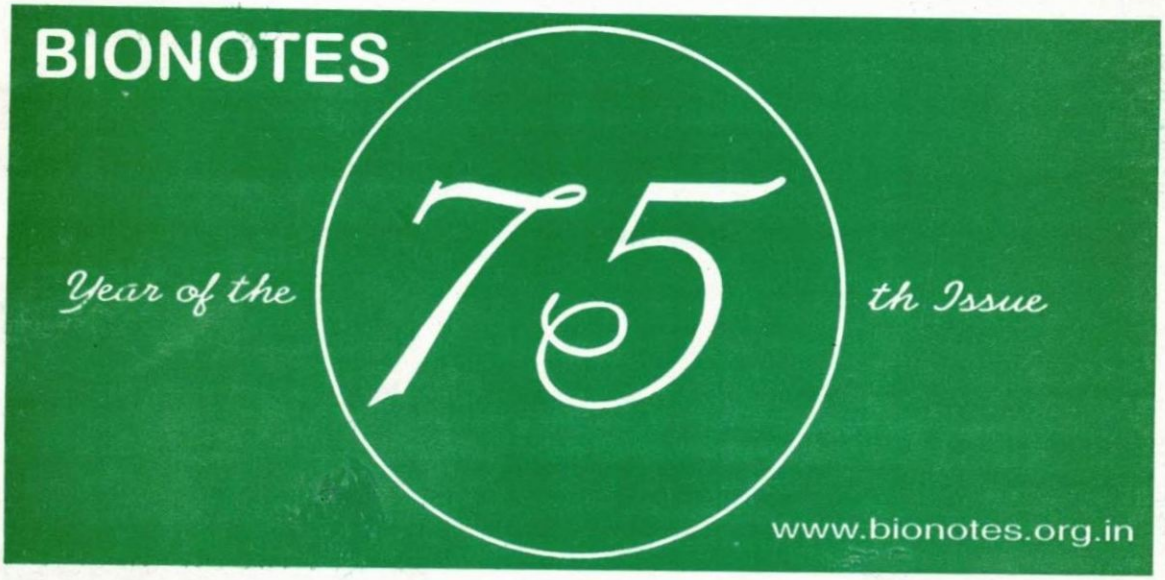

Quarterly Research Newsletter of A Biologists Confrerie

Vol. 19, No. 2 **April - June, 2017**

Management of the Household Waste

Tirunelveli first in the country to have 100% segregation

It took barely a few months for Tirunelveli municipality in Tamil Nadu to achieve the feat of achieving 100% segregation of waste at source across households and establishments. It involved taking undertakings from each household to segregate biodegradable and non-biodegradable waste, campaigns through TV and local radio channels targeting housewives, and roping in religious leaders and NGOs.

The city with a population of 4.8 lakh, achieved this at a time when other cities are either weighing the risk of failure before starting any initiative or considering imposition of penalties on erring residents. The Tirunelveli model can be easily adopted by other cities.

Tirunelveli, which has about 1.6 lakh households, took up this challenge in April, 2016. However, an intensive campaign started only on October 2, taking cue from the Solid Waste Management Rules 2016, which make it mandatory for all waste generators to segregate biodegradable and non-biodegradable waste before disposal, and hand over the segregated waste to authorised waste pickers/ waste collectors.

Delighted at Tirunelveli's achievement of becoming the first Indian city to achieve 100% segregation of waste at source, municipal commissioner S. Sivasubramanian told, "Our sanitation workers went to each house, collected an undertaking from each of them saying that they will segregate waste at home. We distributed two waste bins to every household. I wrote personal letters to each house to make this a success and we made public announcements using loudspeakers across the city for two months."

He said they were surprised to see that only eight households did not segregate the waste after they kicked off the initiative. "We collected Rs. 10 per household as service charge for this. Now, everyone is complying with the change. What we realised is that people will do their bit if we in the administration take required steps," the commissioner said.

While biodegradable waste is collected every day, non-biodegradable waste such as plastic is collected every Wednesday. Sivasubramanian said all municipal staff were deployed only for "outdoor duty" on Wednesdays, which meant no one was in office on that day. "Everyone reports to duty at 6 am and all senior officials lead this initiative," he added.

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BIONOTES

A Quarterly Newsletter for Research Notes and News on Any Aspect Related with the Life Forms

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75th Issue (Sept. 2017) will be the 'Platinum Jubilee Number'. Send your Comments.

Obituary

Anupam Mishra

Environmentalist and the 'waterman' of India, Shri Anupam Mishra, expired at Delhi, in the early morning of 19th Dec. 2016.

Anupam was born on 5th June 1948, as the third son of a renowned hindi poet, Late Shri Bhawani Prasad Mishra, at Wardha (M. P.). Bhawani Prasad ji made a name for himself as a literateur and a follower of Mahatma Gandhi. Accordingly he edited several books on Gandhi, and worked till his end as the editor of '*Gandhi Marg*', a magazine of the Sarvodaya Movement, while he worked in the Gandhi Peace Foundation (Gandhi Shanti Pratisthan) at New Delhi.

Anupam was M. A. in Sanskrit and learnt hindi, sanskrit, english and some local rural dialects of North India. He loved literature and started writing early. He was also a connoiseur of hindi films and had a hobby as photographer. He wrote many travelogues. He also worked life long in the Gandhi Peace Foundation and edited *Gandhi Marg*.

Then he produced two wonderful books in hindi on the water scarcity in Rajasthan. Thses are original accounts with depth of research. These books are entitled as '*Aaj bhi khare hain Talab*' (Tanks and Ponds are relevant even today) and '*Rajasthan ki rajat boonden*' (Silver drops of Rajasthan). These were published by Gandhi Peace Foundation. His last book, also in hindi, is entitled, '*Saaf maathe ka samaj*' (a society with clear forehead). It was published by Penguin India. Earlier he also edited two books, '*Desh ka Paryavaran*' (Environment of the country) and '*Hamara Paryavaran*' (Our Environment). His '*Talab*' book was translated in several languages and saw many editions. He vested the copyright of his all publications in the Gandhi Peace Foundation.

He worked as a 'missionary journalist' till emergency years. Then from UNEP Nairobi, he was given a grant to study and compile a report on the Survey of self-appointed NGOs in India.

Anupam Mishra was a hard core naturalist and deeply involved with environmental issues. He worked with Chandi Prasad Bhatt and Gaura Devi of 'Chipko' fame. He got many projects undertaken in different parts of the country, but stricktly refused to use foreign grants, Govt. posts or land for these. He even refused to take aid from industrialists.

He visited Nairobi a few times and was also delegated to Rio de Janeiro and Paris Summit Meetings, but declined to attend foreign jaunts. He also declined to act as advisor in government bodies.

He suffered a tuberculosis tumour in childhood. In later life he developed coronary and neurological irregularities. These diseases ultimately lead to cancer which took his life.

He received 'Vriksh Mitra Puraskar' from Environment Ministry, Govt. of India. Several environmentlists and celebrities, including Ram Chandra Guha, Prabhas Joshi, Rajendra Singh, Sandeep Joshi, Arun Tiwari, Manish Vaidya and 'Indian Water Portal' family mourned his death. Newspapers and magazines (*Down to Earth* etc) carried obituary articles.

—RKV.

Estimation of Religion-wise Baby Births by 2060

Hindus will witness a "dramatic" drop-off in births between the years 2055 and 2060, due to declining fertility in India, which is home to 94% of the Hindu community's global population, according to a new Pew research.

The Pew Research Centre (U.S.A.) study also said that the number of babies born to Muslim women is expected to overtake those born to Christians world-wide within two decades, making Islam the world's largest religion by 2075.

Beyond 2015, Christian and Muslim mothers are expected to give birth to increasing numbers of babies through 2060. But Muslim births are projected to rise at a faster rate—so much so that by 2035 the number of babies born to Muslim mothers will narrowly surpass the number born to Christian mothers.

Between 2055 and 2060, the birth gap between the two groups is expected to approach 6 million (232 million births among Muslims vs 226 million births among Christians).

By contrast, the total number of births is projected to decline steadily between 2015 and 2060 for all other major religious groups, said the study, which was released in April 2017.

"The drop-off in births will be especially dramatic for Hindus—who are expected to see 33 million fewer births between 2055 and 2060 than between 2010 and 2015—due in large part to declining fertility in India, which is home to 94% of the global Hindu population as of 2015," according to the study titled '*The Changing Global Religious Landscape*'.

A Fishy Story

Do you view Seafood as a single category? Go for the largest Prawns, or the pinkest Salmon? Or are you someone who cares which Fish is in your curry? There's a catch to being a fish expert today

VIR SANGHVI

Do North Indians like the taste of fish? The smell? Can they even tell one fish from another? I'm beginning to wonder. My current theory is that they may like the idea but all fish fall into a general amorphous category for them. When they do make a choice, it is size that sometimes matters more than taste. Why else would they insist on ordering those tasteless, rubbery, very large prawns that all restaurants now feel obliged to serve? (Ask for a small prawn at most places these days and they will look at you as though you are mad. And this, though the smaller prawns are often the tastiest.)

I grew up in Bombay, where the smell of fish was never very far away. The Koli fishermen would dry their bombil on the road next to Cuffe Parade, which was a seafront in that era, not a hideous residential colony built on reclaimed land. The idea of going to a fish market was not as repugnant to people in Bombay as it is to Dilliwallas who can't stand the smell. And chefs and cooks at good south Bombay restaurants would go to Sassoon Docks in the morning to see what the fishermen had brought for sale.

By the time I moved to Calcutta in the Eighties, I began to realise that the fish experts of Bombay were amateurs. In Bengal, buying fish was a sacred ritual for the men (it tended to be the husbands who went to the fish market; the wives stuck to cleaning and cooking the fish), each of whom claimed to know the best fishmonger and would offer advice on how to tell exactly how fresh a fish was (It helped to look into the fish's eyes, apparently.)

I wonder sometimes if the new generation of Bengali men have abandoned the habit of going to check out the fish. In Bombay, fish buying has now become a plastic-wrapped affair: even the fancy chefs don't bother to go to Sassoon Docks or any fish market.

There's always a simple way of telling how much somebody knows about fish. If he describes a dish as being made with a particular fish, then he knows what he is talking about. In Bengal, they will always know which fish they are eating and endless debates will take place over the provenance of the fish. A subject like the difference between a Bangladeshi hilsa (illish) and the West Bengal version can keep a group of Bengalis going for at least a couple of evenings. (My friend Jeet Chowdhury says these debates are bogus—most hilsa now comes from Gujarat or even Burma.) And if you dare suggest to a Bengali that you like sea prawns, you will get contemptuous looks and a lecture on the virtues of freshwater prawns. (Look: they suck the brains out of their prawns so they must know what they are talking about!)

These days, states that really understand fish (West Bengal, Kerala and a few others) are the only ones where diners care about the difference between a pomfret ("useless, tasteless fish", I was told in Calcutta) and a bhetki or a karimeen and an aila. The others are happy to eat 'fried fish' or 'fish curry'—it really doesn't matter what the fish is.

Sadly we carry this ignorance forward even when we eat other cuisines. At few Chinese restaurants will they bother to tell you what fish they are using. At restaurants serving European food where there is a minimum of spicing and the kind of fish used does matter, they don't provide much information either. So thousands of Indians eat the Chilean sea bass (because we like the way the fish flakes when you cut into it) without realising that it is not a sea bass at all. It doesn't help that menus and chefs now routinely drop the word 'Chilean' (which is the giveaway) from its name. And many Indian chefs actually believe that this is a true sea bass, never having tasted the wonderful, meaty flavours of the real thing. (For the record, the so-called Chilean sea bass's real name is the Patagonian toothfish. Not so glamorous now, right?)

It's the same with black cod at Japanese restaurants. It is not a cod at all. It is not even a single fish. It is a term applied to several kinds of fish (including most notably the sablefish) on restaurant menus. It has flaky flesh (like the so-called Chilean sea bass) and is popular with people who think that the black cod is a kind of cod that God specially couriered to Nobu (who made Black Cod in Miso famous).

So why do Indians like these mislabelled fish? Well, basically it comes down to texture, and an absence of a very fishy taste. And there's another factor: fat. People who don't really like fish love the fatty taste of some farmed fish. (A black cod is much, much, fattier than real cod). Let's take the most notorious example: salmon. Most of us have eaten

salmon at some stage—in sushi, as sashimi, as smoked salmon or as a fillet in a fancy restaurant. The chances are a) that we've eaten farmed salmon, because wild salmon accounts for less than 10 per cent of global consumption, b) that we've eaten salmon produced by a Norwegian company—the Norwegians dominate the world market and farm salmon in other countries as well, and c) that we had no idea that the fish was artificially coloured to look like the real thing because farmed salmon has a dull and unappetising colour.

The chances are, also, that we are largely unaware of the global controversies about farmed (and especially Norwegian) salmon. Nor have we worked out why we like the fish. But I'll tell you why we like it. It is because it is full of fat. A real salmon swims so much in the wild that it develops muscle. A farmed salmon doesn't get to swim, develops hardly any muscle and is essentially an artificially coloured lump of fish fat. The cheaper the salmon, the more likely it is that it has been farmed in overcrowded pens or cages (to increase production) and therefore has swum very little.

Many years ago when I wrote that I try and avoid Norwegian salmon, the Norwegian fish industry, which spends vast sums of money trying to promote its fish in India, got very agitated. So I will say nothing this time. But you should know that there are global concerns about Norwegian salmon (Google it and you'll see) and that Norway's own media have been full of articles about these concerns especially when, in 2013, a Norwegian paediatrician called Anne-Lise Bjorke Monsen went public about the toxins she claimed the fish contained.

Lest you think I'm targeting the Norwegians, let me also point out that analysis by British scientists found that while a pizza from Pizza Express contained 6.4g of fat per 100g, some Scottish smoked salmon contained more than double that quantity: 14g of fat per 100g. On the other hand, wild salmon usually contains something like 3g of fat per 100g.

So don't let anyone tell you that fish is necessarily the healthy option! Far better and cheaper to eat a pizza rather than some of this mass-produced rubbish.

But these days, not only do chefs not bother with locally sourced fish, they don't even bother to find fish that anyone has heard of. Instead they rely on a frozen fish that comes from Vietnamese fish farms. It is called basa and I've yet to meet a fish lover who can discern any flavour at all in it. But that may actually be the reason chefs like it. The absence of flavour makes it perfect for chefs who know nothing about fish because they introduce any flavour they like into the dish. Plus it comes ready filleted and frozen in packets. And most important: it's CHEAP! (It can be half the price of better known fish).

So why bother going to the market and looking for fresh fish when your supplier sends you cheap farmed fish in nice frozen packets, hand-delivered to your kitchen?

In my view, basa has more in common with paneer than with any fish and the only chef who has ever made a basa dish I liked was Manish Mehrotra and he used it for something that was basically a paneer dish, substituting the paneer with basa.

All of which leads me back to where we started. Let's be honest. North Indians don't really like the taste of real fish. And except for a few states, most Indians don't understand fish at all.

Perhaps a generation from now we will be known as the land of the frozen, flavourless fish!

(Reproduced from May 3, 2015 *Hindustan Times Brunch*).

World Happiness Index 2017

U. N. O.'s Sustainable Development Solutions Network (SDSN) issued the fresh 'World Happiness Report 2017'. Altogether 155 countries are covered in it, in which India, incidentally, stands at a lower 122nd place.

First 10 placed countries are—

1. Norway, 2. Denmark, 3. Iceland, 4. Switzerland, 5. Finland, 6. Netherlands, 7. Canada, 8. New Zealand, 9. Australia, and 10. Sweden.

The parameters to survey happiness index were the same as earlier—GDP per person, life span, social cooperation (how many people will help you in difficulties), belief in the Govt. (corruption free regime and trade), freedom to take own decisions, etc.

In this report, African countries are again at the bottom. Ten worst placed countries in this list are—South Sudan, Liberia, Guinea, Togo, Rwanda, Tanzania, Burundi and Central African Republic. Other two lowest places are for Yemen and Syria.

Among neighbouring countries of India, best placed is Bhutan. Even Nepal, Bangladesh, Pakistan and Sri Lanka are above India in the Happiness Index 2017.

America is slipping down one place than last year. UAE has appointed a Minister to take care of the happiness of its nationals.

The Sl. no. of the place of some other countries in this list are as follows:

14. USA, 16. Germany, 19. Great Britain, 26. Singapore, 31. France, 49. Russia, 51. Japan, 79. China, 80. Pakistan, 97. Bhutan, 99. Nepal, 100. Bangladesh and 123. Sri Lanka. And as informed above—122. India.

[See *Bionotes*, vol. 17, No. 2, p. 35 for World Happiness Index 2015.]

Lion numbers outside Gir to double by 2027
Gujarat has achieved its goals

HIMANSHU KAUSHIK
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Asiatic lions recorded a threefold growth in numbers in the past 50 years. Out of the current population of 523 lions, 313 are inside Gir and other protected sanctuaries, while 210 live in close proximity to humans.

What is alarming is that the number of Big Cats living near human habitats is likely to double in the next decade, say a research paper published by H. S. Singh, Member, National Board for Wildlife (NBWL).

The paper titled 'Dispersal of Asiatic lion and its survival in human-dominated landscape outside Gir forest,' published in '*Current Science* Magazine,' says that the lion population in Gir and nearby areas had grown over threefold between 1965 and 2015. The number of Asiatic lions had increased from around 170 in 1965 to 523 in 2015.

"Of the existing 523 lions, only around 313 are found in Gir, Girnar, Mitiyala, and Pania sanctuaries, while 210 dwell in close proximity to humans outside the protected areas," Singh said.

He further said that during the past two decades (1995-2015), the number of lions outside Gir had increased steadily from 42 to 208. The growth in the number of lions, however, is pegged to the fact that currently the Asiatic lion population is dominated by lionesses.

"If the present trend continues, the number of lions outside Gir forest is expected to double within the next 10 years," Singh said.

Interestingly, the growth in the number of lions is pegged to the fact that currently the Asiatic lion population is dominated by lionesses. "The number of reproductive lionesses is currently four times higher than that recorded in the 1970s," Singh says in his research paper.

Singh said that dispersion of lions had taken place beyond the expectation of conservationists. Currently lions inhabit 57 per cent villages in Junagadh, Gir Somnath, Amreli and Bhavnagar districts, he said.

"In future, Rajkot, Botad, Porbandar and Jamnagar—having a good lion prey base including blue bulls, wild boars and feral cattle—are expected to become potential lion habitats," Singh said.

The paper also states that industrial and mining activities around Veraval coast had forced the lions out of the area. Further, change in land-use pattern and disappearance of wastelands and community lands are other problems affecting the lions.

People around the Gir forests and some of the satellite areas are aware of the habits of the lions and have developed an understanding to live with them in harmony.

Villagers in some of the new satellite areas have little understanding of the behaviour of the lion. They need to be educated, the paper says.

The 12-member expert committee set up by the Supreme Court to oversee translocation of lions from Gir to Kuno-Palpur in Madhya Pradesh, has stated that Kuno Palpur was suitable for translocation.

However, a research paper published by National Board of Wildlife member H. S. Singh seems to imply that Kuno site has become unnecessary as its objective had been achieved by Gujarat.

Singh's research paper says that the Kuno site was designed to increase the lion population beyond 500 and to improve the position of Asiatic Lions from 'Critically Endangered' to 'Endangered' in the IUCN Red List.

Both these objectives that were planned two decades back have already been achieved by Gujarat through it's conservation practises. The research paper further states that the population of lion is growing only because the people of Gujarat take pride in them and feel that they own these lions. Conservation of wildlife is deep-rooted in the culture and tradition of Saurashtra, the paper says.

However, despite their growing population, the lions face threat from development of industries and ports, mining activities, and rail and high-speed roads in the coastal areas. The increased frequency and speed of goods trains on Pipavav-Rajula line is a new threat as 10 lions were killed during 2013-15.

Pipavav port and related activities near Kaj wetlands in Kodinar taluka are a source of disturbance to a group of lions settled there.

Recently, Prime Minister Narendra Modi announced conversion of six state roads as National Highways. Of these new highways, the Una-Chotila highway passes close to the Sanctuary. The research paper states that the road network, and widening and converting some of them as high-speed roads are a matter of concern for lion conservationists.

Desi Scents—Sandal, Jasmine and Green Tea
Indian Perfumers trying to develop New Aromas

SHOBITA DHAR

1. Jasmine—Strong, sweet, floral scent. 1 ml of essential oil is extracted from 8,000 jasmine flowers.

2. Sandalwood—Woody, milky notes. Sandal Wood tree takes 25 years to mature, so oil availability is scant. Its fragrance reduces stress and promotes sleep.

3. Musk—Extracted from a small gland in the musk deer, the oil is used as a base note in perfumes. Strongly sensual smell considered an aphrodisiac in many cultures.

4. Tuberose—Strong floral feminine scent. Has long been known for its aphrodisiac properties.

When most Indians still swear by French classics like Chanel No. 5 and J' Adore by Dior, it's strange to hear of a scent that smells like chai. But that's exactly what 30-year-old perfumer Manan Gandhi has created. Along with a team of international noses, the founder of *Bombay Perfumery* has introduced a line of uniquely Indian scents like Chai Musk that sells for Rs. 4,100 for a 100ml bottle. "Our perfumers were keen to make a wearable chai. They created a blend from ginger, lemongrass, green tea essence and sandalwood to develop a musky chai fragrance," says Gandhi who launched the brand in 2016. A darker formulation, Moire, is a homage to the Indian tuberose. "To give it a dark, narcotic edge, we added a hint of leather," adds Gandhi who prefers a peppery, spicier Calicut for his daily personal use. Each perfume takes about a year to develop.

Bombay Perfumery isn't the only one trying to capture India's aroma in a bottle. Despite a strong tradition of oil-based perfumes (attar), desi scents had fallen out of favour with Indian consumers but now some cosmetic and fragrance brands are trying to give them a new push.

Forest Essentials has a popular line of body mists created from blends of traditional Indian scents. "From the Bengal tuberose to the Kashmiri nargis, each flower is hand plucked at a particular time of the day when it is at its maximum potency to ensure high quality essential oil production," says Dr Ipsita Chatterjee, senior beauty consultant at *Forest Essentials*. She says these mists are among *Forest Essentials*' top selling items.

Many younger users swear by desi scents. Jhelum Biswas Bose, a 36-year-old beauty expert, switched to oil-based Indian perfumes a year ago and now refuses to use anything else. "Natural oils feel very different, and over time your nose gets trained to sniff out what's natural and what's not. You just need a drop or two of oil-based perfumes and they keep you smelling nice through the day as well as lift your mood," says Bose. After attending a perfumery workshop, she now develops her own scents at home, using natural ingredients.

Perfumery is not new to India. In fact, it dates back to the Indus Valley Civilization. Perfumer Jhanvi Dameron Nandan points out that ancient Indians used aromatic ingredients like camphor and sandalwood to create fragrances. "Indians were the first in the world to use solid perfumes such as sandalwood paste. It was applied on the forehead and chest. Special wood burnt in yajnas and resins in earthen pots would give off aromatic vapour which was used to scent interiors, garments and even hair," she says. The practice of using flowers for perfumes came to India with the advent of the Muslim rule. "Muslim rulers used to plant floral gardens and hedges in their towns and cities. The fragrance from the flowers was used as an olfactory compass to help people find their destination at night," says Nandan whose brand, *The Perfume Library* has more than two dozen perfumes concocted using traditional Indian ingredients, and is selling in Mumbai, Delhi, Jaipur, Kolkata.

Aphtoori Absolute is a fruity, smoky perfume Nandan has created by blending jasmine, sage, smoky musk, grass leaves, tobacco, and green tea. An earlier offering from Nandan was the intoxicating Bhang Bang. Her inspiration goes beyond her nose to ancient texts like the 15th century *Ni'matnama (Book of Delights)*. Written by Ghiyat Shahi, sultan of Mandu, the book details the perfuming rituals of the time. A recipe mentioned in this book lists around 35 ingredients including musk, white ambergris (a sweet, earthy scent from a wax-like substance produced by sperm whales),chickpea flour, civet musk and wheat.

It was the perfumers of Kannauj in Uttar Pradesh who created the scents Mughal emperors loved, and it still boasts of some 400 perfumers who make Indian scents. One of their most unique offerings is mitti attar which smells like wet earth and is made using a traditional system of capturing rain water and distilling it.

In recent years, the clampdown on the sandalwood trade in Karnataka and on the use of musk deer for its essence has adversely affected the local industry in India. "Now, we can buy sandalwood oil only from a registered Govt. agency and it is very expensive, $2,500- 3,000 per kg," says Gandhi.

(Contd. on page 46)

GUNTER PAULI
The Belgian Steve Jobs of Sustainability
On the Disposal of Urban Solid Waste

HARI PULAKKAT

"We give awards to companies that pollute less," said Gunter Pauli at a recent conference in Bengaluru organised by Ashoka Trust for Research in Ecology and the Environment (Atree). "And we put in jail people who steal less. We forget that polluting less is still pollution." For Pauli, nothing more than zero waste is acceptable: no landfills, no burning, no discharge into the rivers, no e-waste to ship into another country.

Pauli a Belgian serial entrepreneur who lives in Japan and now works in South Africa—and who has sometimes been called the Steve Jobs of sustainability—has projects in four continents on sustainable farming, on handling urban solid waste, on using the ocean for future food, energy, and so on. In 1992, he built a zero-emissions factory making soaps out of wood. A year later, he found out that it was non-sustainable. This learning resulted in the non-profit Zero Emissions Research and Initiatives (ZERI) in 1994, based in Tokyo. It has since grown around the world. Last year, a report by the University of Pennsylvania on global think tanks, ranked ZERI at number seven among those with the most innovative ideas.

On the day Pauli spoke in Bengaluru, a newspaper had reported about a plan to use trains to take garbage out of the city, to a town called Madhugiri, about 100 kilometres away for incineration. Bengaluru no longer has space in neighbouring areas to bury garbage. Building incinerators in the city is an idea that will be opposed from the beginning. Residents of Madhugiri are opposing it, too.

Urban solid waste is a seemingly intractable problem in Indian cities, as the garbage mounts and cities run out of space. ZERI has worked on solid waste around the world and has got together some unique ideas for solid waste management. "They have not run out of space," says Pauli. "They have run out of ideas to make it work. The easiest solution is to ship it out. We first dump it, and then we incinerate it, and we realise that even the incinerate is a toxin".

ZERI has worked with the city of Milan in Italy to reduce waste by 90%. The non-profit's plan is to get the biomass out and do useful things with it. It is working with the city of Milan to recover organic waste. "Milan is now recovering 90 kg of biomass per person per year. It is number one in the world."

Separating organic waste is one thing, making use of it another. Composting does not generate enough money. "In the city, you can't compost," says Pauli, "as composting generates methane. You have to generate values." The trick is to separate the bio-waste further, with an eye on commercial activity. Pauli's prime exhibit is coffee waste, increasing in the country as coffee shops become popular in the cities. "We can take a tonne of coffee waste and produce a tonne of mushrooms."

Similarly, citrus fruit peel can be used to make detergents. "We have mapped hundreds of opportunities. The question is, do we have the entrepreneurs to turn them around?"

Once you generate value for your waste, people look at it differently. Would you throw your coffee waste if someone pays for it? Brazil has eight such factories, according to Pauli. Mexico is starting a factory to process mango seeds and turn it into an additive for bread. "How many mango seeds would India have? Your bread is junk bread. Spongey and junk. You can make good bread by using mango seeds." Similarly, unused part of vegetables can be used to feed maggots, which in turn can feed the chickens. Maggots can digest almost everything.

Once the organic waste is separated and used up, only a small part is left for composting. Since organic waste is more than half of the city waste, a series of small and networked factories can reduce the total waste significantly. The rest is dominated by two waste streams: plastic and electronic waste. ZERI claims to have a technology to break down plastics using enzymes. The toxic chlorinated plastics are broken down using a combination of enzymes and heat treatment, and then the other plastic are also treated in a similar way. "There are compounds in plastics that industry will not tell you because it is less than 1%," says Pauli. With a judicious use of enzymes, heat and high pressure, plastic can be turned into a fuel that can be burned safely.

The last category is e-waste, an extremely toxic and difficult category to handle. The state-of-the-art method is to evaporate them in a vacuum. "This is a non-starter technology," says Pauli. "We focus on another technology called chelation." It crushes the waste and then allows you to take out each constituent seprately for reuse.

In the end, every bit of waste—organic, plastic and metals—goes into another product that will be used. Pauli has one project in India, near Kaziranga National Park, where he has helped grow mushrooms using tea waste. No one has asked him yet to deal with Indian urban waste. Is the waste train a better alternative?

(From the *Economic Times*)

Maintain Your BRAIN

So What should you do ?

Two pounds lost could elate; two gained could discourage. Two pounds is a foetus at seven months, five apples, six tomatoes. Yet today, we bring you by far the most amazing, versatile, clever, compact, intricate and absolutely best use of 32, give or take a few, ounces: the brain.

Between two and three pounds of wonder, it controls everything we say, do or think. Who we are and what we care about. The way we walk or laugh or figure out things. What we like and the talents we possess. The brain uses 20 per cent of our body's oxygen and 20 per cent of its blood. Somewhere within its protein, fat, 100,000 miles of blood vessels and 100 billion nerve cells, it helps us remember where we put our shoes. Regulates our temperature so we don't succumb to the heat or cold. Speeds us up or slows us down.

Its intricacies are stunning—far beyond anything most of us can imagine. To keep this work of art as polished as possible, we need to eat right. To exercise. To keep mentally stimulated.

Exercise stimulates a hormone in our brain that aids memory. Good nutrition helps brain cells communicate with each other. Mental stimulation keeps you sharp even as you age. "It's very important for the people to be physically and mentally active," says neurologist Malcolm Stewart, medical director of the Human Performance Laboratory at Presbyterian Hospital of Dallas (U.S.A.). He cites a study in which research is being done on nuns well into their 80s, 90s and even 100s. The women eat healthy and don't smoke or drink. They keep physically active and mentally alert by praying, knitting, listening to music, walking , working in their gardens. Upon their deaths, their brains are autopsied.

"They were riddled with Alzheimer's, but didn't show it," Stewart says. "They kept active. All this doesn't prevent pathology but it allows you to keep your function. You can't give that as medicine or as a pill. You have to generate this yourself, by what you do or how you are physically or mentally.

Nutrition

The hypothalamus, at the base of the brain, regulates appetite. The frontal lobe, which neurologist Malcolm Stewart calls 'the boss', helps you make choices. Fried rice or steamed? Small milk shake or large? Eating poorly contributes to the development of vascular disease, which can have a negative impact on longevity and cognitive functioning, says Dion Graybeal, a neurologist at Baylor University Medical Center, Dallas.

So you should: Avoid fast food and drink alcohol in moderation.

Exercise

Exercise increases the activity in the frontal lobe of the brain. "You can get the runner's high; that's endorphins, your own narcotics. People get addicted; it's the body's reward system for exercise," says Stewart.

Additionally, the motor system sends a signal that increases the amount of a hormone called brain-derived neurotrophic factor, or BDNF. "Its like brain fertiliser, or Miracle-Gro for memory cells," Stewart says.

So you should: Do a combination of stretching, aerobic and muscle-strengthening routines.

Mental Games

Staying mentally active and alert keeps your brain fit by using multiple parts of the brain such as association areas, higher reasoning and processing regions, and visuospatial areas. The part of the brain affected by enrichment activities may vary.

For language-based activities, such as reading , the left side (frontal temporal) is primarily involved. For number games such as Sudoku, the right side (parietal area) is involved. Listening to music can involve both sides.

So you should: Get six to eight hours of sleep every night, Stewart says. Try to have a sense of hope about the future. Reduce stress by exercising, meditating or praying. Do puzzles. Listen to music. Reach out to others to make their lives better.

—MCT

(b. f. from page 44)

Nandan adds that almost all musk used in the perfume industry today is created in labs.

Indie perfumers are trying to reinvent Indian perfume but their products are still in nascent stage. Mohit Khatri, founder of an online portal that curates *indie perfumes* from around the world, says their products and presentation lack quality. "They offer a 5% perfume concentration in a 100 ml bottle compared to 20% by western brands," says Khatri.

In the past two years the government too has shown intent to revive local perfumes. Fragrance & Flavour Development Centre (FFDC) in Kannauj is trying to promote traditional perfume-making. The FFDC has been holding seminars and workshops on perfumery and will be opening two more campuses in Deogarh (Jharkhand) and Imphal (Manipur).

BIBLIOGRAPHIA ODONATA INDICA
A Regional Bibliography of the Damsel- and Dragonflies of India

R. K. VARSHNEY

A Biologists Confrerie,
Raj Bhawan, Manik Chowk, Aligarh (U.P.).

(Contd. from *Bionotes* Vol. 19, No. 1, p. 16)

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(To be continued).

Woman's BP could influence Sex of Child

A woman's blood pressure before she gets pregnant could effect whether she has a boy or girl, scientists have claimed. Researchers found those women with lower blood pressure tended to have a girl, while higher blood pressure was an indication that a boy was more likely to be conceived.

The issue is controversial because of the practice of gendercide—in which female babies are aborted or even killed after birth—in some male dominated societies. One of the researchers, Dr Ravi Retnakaran, an endocrinologist at Mount Sinai Hospital in Toronto, said their research suggested "a woman's blood pressure before pregnancy is a previously unrecognised factor that is associated with her likelihood of delivering a boy or a girl".

This novel insight may hold implications for reproductive planning. The scientists studied a group of women from Liuyang in China who were planning to get pregnant.

On the Decline of Population of the House Sparrow in Urban Areas of India

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House sparrow, *Passer domesticus* (Linnaeus, 1758), a small bird locally known as 'Chorui' in India is closely associated with human habitation and cultivation from historic times (Bhattacharjee et al., 2011). Close symbiotic association with the human has driven them to be dependent on human environment. Being colonial nesters, decrease in sparrow colony size inhibits breeding of remaining individuals (Summers - Smith, 2003). Due to its wide range of distribution even in the hilly region (up to 4000m in the Himalaya) and sensitivity to the changing environment, it was preferred as indicator species for monitoring the urban ecosystem (Hussain et al., 2014). As nesting materials house sparrow prefer grass, straw, jute threads, leaves, weeds, feathers (Balaji et al., 2013; Kumar et al., 2015) to build their nests in the crevices of thatched roofs of old houses, electric pipelines, in ventilation holes etc (Ali, 1996). The other detrimental factors are shortage of food supply and less green vegetation on breeding grounds in urban or peri-urban areas (Hussain et al., 2014). These birds never use shrubs or trees for nesting (Kumar et al., 2015). Significant numbers of nest were recorded within very close proximity to food shops and water resources (Nath et al., 2016).

It was suggested that the vanishing of the sparrows from urban-metropolitan areas to peri-urban and rural areas for survival clearly indicates that urbanization has a direct effect on the decline of sparrow population (Modak, 2015). Many have made effort to find out the reasons of this decline. Negative relationship between urbanization and house sparrow population is pronounced in planned city (Ghosh et al., 2010). This coincides with the view that most severe trend of population decline of house sparrow is found in areas of high socio-economic status, while it's relatively stable in low income areas (Dandapat et al., 2010). With increasing urbanization all the birds species including house sparrow are facing the scarcity of resting as well as nesting places in metropolitan area (Chakraborti, 2015).

Factors like predation, pesticides, pollution and electrosmog have been added by Kumar et al. (2015) as effective contributors to the population decline. A possible link of urban decline of house sparrow population with electromagnetic radiation for affecting the eggs was also suggested (Balmori & Hallberg, 2007). It was reported that long-term exposure to low-intensity electromagnetic radiation from mobile phone had resulted in reduction in number of house sparrow especially the males (Everaert & Bauwens, 2007). The long duration exposure may affect the immune system of all of the birds which increases the chance of microbial infection (Balmori, 2009). Even tall tower height has significantly negative influence in disorientation of many birds including house sparrow (Vijay & Sushma, 2015).

Another cause may be the modern lifestyle. In urban areas the houses have been converted into RCC from the conventional tiled roofs for compatibility with the air condition which are devoid of any crevices or holes or ventilators. For survival, nesting in open areas has made house sparrow population susceptible for human disturbance and predator attacks (Anandam et al., 2014; Kurhade et al., 2013). House Sparrow was one of the depredatory grainivorous species for rice, pearl millet and pulses (Kamath et al., 2014). In big cities and growing urban areas, modern departmental stores have been flourished replacing local roadside corner shops and roadside pice hotels which provide everything in packed pockets within closed door environment causing little chance of spill of grains on the roads which might result in shortage of food supply for the house sparrow (Balmori & Hallberg, 2007).

When any population is under stress detrimental factors in the environment badly affect the populations to cause local extinctions and ultimately in course of time which leads to the large scale decline (Singh & Kler, 2015). Awareness for environmental consciousness in urban areas and proper planning and management programme for improving the environmental health in urban areas can continue the scenario of co-existence in harmony; otherwise it's not far away that we have to represent the common house sparrow as a fairy tale character to the next generation.

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Conference

Forestry Conference in India after 50 years' gap

Thrity-nine Commonwealth member countries deliberated on some of the grave issues affecting climate and green cover at the Nineteenth Commonwealth Forestry Conference held at Forest Research Institute (FRI), Dehra Dun, from April 3 onwards.

The conference was last held in India almost 50 years ago, in 1968, in New Delhi. Some 700 participants, including experts, scientists, forest officials and NGOs from India and other member countries, made 470 presentations on climate change, forest fire, community participation and ways to improve forest productivity and green cover, during the course of the five-day long event. Governor K. K. Paul inaugurated the conference which was being organised on the theme 'Forest for Prosperity and Posterity' in consonance with Aichi targets of the UN Convention on Conservation of Biological Diversity and Sustainable Development Goals. FRI director Dr Savita organised the decision to hold the event, which was being held in collaboration with the Ministry of Environment, Forest and Climate Change, Govt. of India.

Male Genitalic Studies of *Anambulyx elwesi* (Druce) from India (Lepidoptera : Sphingidae)

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While revising the Sphingidae of world, Rothschild & Jordan (1903) described a new monotypic genus *Anambulyx* with *elwesi* Druce as its type species, which is known from northern Pakistan, northern India, Nepal, south-western China, northern Thailand and northern Vietnam. Bell & Scott (1937), D'Abrera (1987), Allen (1993), Kitching & Pittaway (2000) and Rafi et al. (2014), have used the same nomenclature. Smetacek (2004) described the population of *A. elwesi* in Uttarakhand, India, as a separate subspecies, namely *Anambulyx elwesi* subsp. *kitchingi*, but Rafi et al. (2014) have synonymised it.

In the present study, the male genitalia of this species has been studied in detail. The terminology for naming various parts of genitalia has been followed after Klots (1970).

Genus *Anambulyx* Rothschild & Jordan

Rothschild & Jordan, 1903, *Novit. Zool.*, 9: 307; Bell & Scott, 1937, *Fauna British India, Moths*, 5: 228-229.

Type species: *elwesi* (Druce).

Distribution: Oriental and Palaearctic regions.

***Anambulyx elwesi* (Druce)**

Anambulyx elwesi, Druce: Rothschild & Jordan, 1903, *Novit. Zool.*, 9: 312; Seitz, 1928, In Seitz's *Macrolep.*, 10: 543; Bell & Scott, 1937, *Fauna British India, Moths*, 5: 232. *Ambulyx elwesi* Druce, 1882, *Ent. Mon. Mag.*, 19: 17; Hampson, 1892, *Moths India*, 1: 79.

Type locality: Darjeeling (West Bengal, India).

Male genitalia: Uncus of moderate size, broad, ventrally setosed, well sclerotized; distal end narrow, laterally compressed with blunt apex; gnathos reduced, well sclerotized with rounded distal ends; tegumen broad at base of uncus, inverted U-shaped, slightly sclerotized, almost 2X length of vinculum; vinculum short, semi sclerotized ending into quite long saccus with clavate endings; juxta U-shaped, well sclerotized; transtilla narrow, bar-like. Valva with costa narrow, sides sclerotized; sacculus broad, moderately sclerotized; saccular projection broad, distal end bifid, both arms well sclerotized with blunt apices; distal half of valva broad, globular, semi sclerotized armed with short spines. Aedeagus narrow, quite long, well sclerotized; distal end with two pointed spines; vesica without any armature. (Figs. 1-6)

Wing Expanse: Male: 86 mm; Female: Not examined.

Material examined: Assam: North Cachar Hills, Jatinga 4.ix.1991, 1♂. Himachal Pradesh: Palampur, 25.vi.1999, 1♂.

Distribution: India: Western Himalaya. The reporting of this species from Jatinga (Assam) is its first record from North-East India. Elsewhere: China, Myanmar, Nepal, Thailand and Vietnam.

Remarks : This species is superficially similar to *Callambulyx rubricosa* (Walker) but can be distinguished with respect to origin of veins M_1 in forewing; M_1 and Rs in hindwing and characteristic long saccus and aedeagus in male genitalia. The other features which make it distinct are absence of retinaculum and subapical pair of hindtibial spurs.

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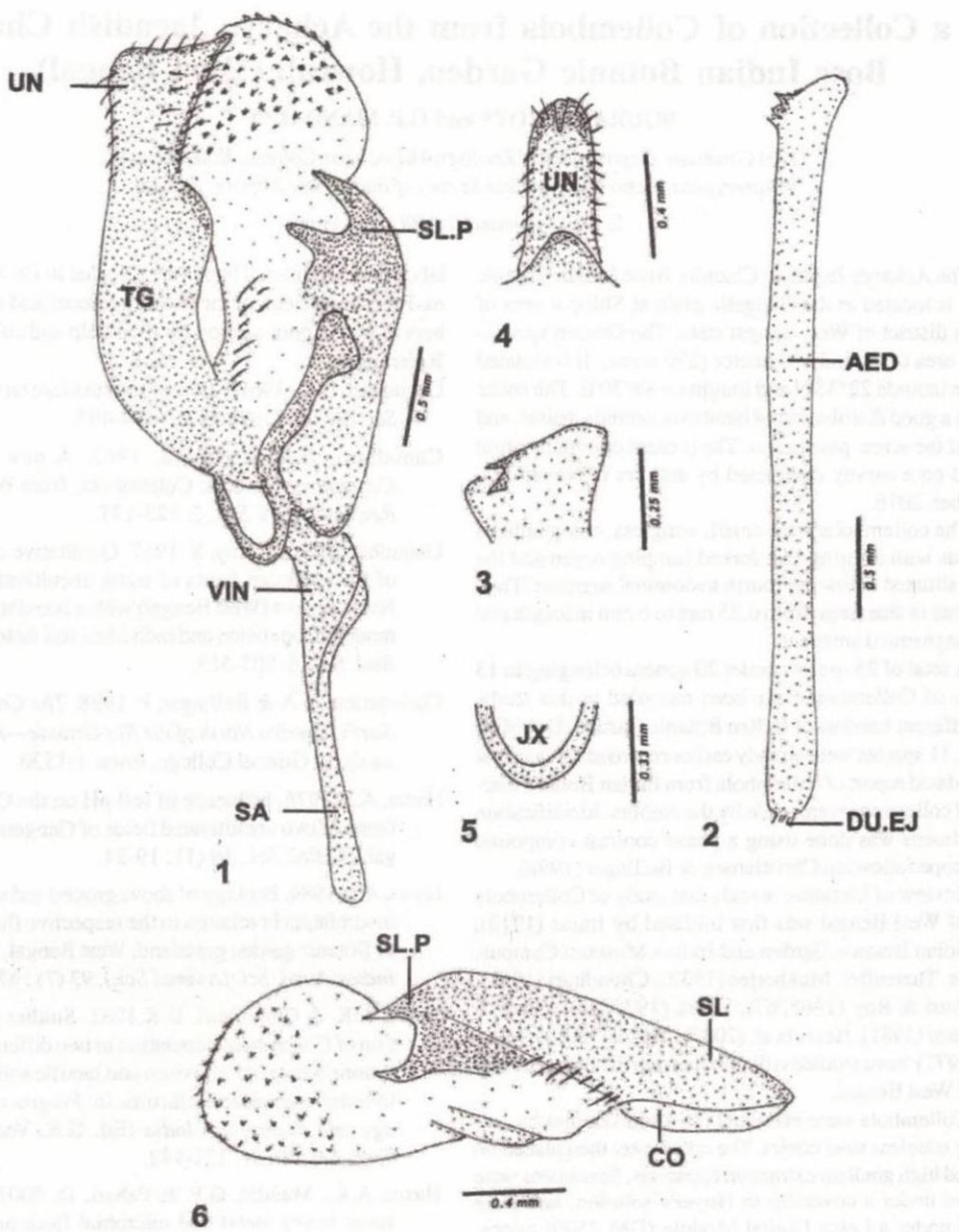

Fig. 1-6. ***Anambulyx elwesi*** **(Druce)** : 1. Male genitalia - lateral view; 2. Aedeagus; 3. Aedeagus - distal end (enlarged); 4. Uncus - Ventral view; 5. Juxta - Ventral view; 6. Valva - Ventral view.
Abbreviations—AED: Aedeagus; CO: Costa; CRP. BU: DU. EJ: Ductus ejaculatoris; JX: Juxta; SA: Saccus; SL: Sacculus; SL.P: Saccular Projection; TG: Tegumen; UN: Uncus; VLA: Valva; VIN: Vinculum.

On a Collection of Collembola from the Acharya Jagadish Chandra Bose Indian Botanic Garden, Howrah (West Bengal)

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The Acharya Jagadish Chandra Bose Indian Botanic Garden is located in the Gangetic plain at Shibpur area of Howrah district of West Bengal state. The Garden sprawls over an area of around 109 hector (270 acres). It is situated between latitude 22°33'N and longitude 88°30'E. The entire area has a good distribution of bamboos, orchids, palms, and plants of the screw pine genus. The present communication is based on a survey conducted by authors in November-December, 2016.

The collembolans are small, wingless, entognathous hexapods with a spring-like forked jumping organ and the furcula situated below the fourth abdominal segment. They are minute in size range from 0.25 mm to 6 mm in length and with 4 segmented antennae.

A total of 25 species under 20 genera belonging to 13 families of Collembola have been recorded in this study, from different habitats of Indian Botanic Garden. Out of 25 species, 11 species were already earlier recorded. This is first consolidated report of collembola from Indian Botanic Garden. All collections were made by the authors. Identification of specimens was done using a phase contrast compound microscope following Christiansen & Bellinger (1998).

Review of literature reveals that study of Collembola fauna of West Bengal was first initiated by Imms (1912), from Indian Botanic Garden and Indian Museum Campus, Calcutta. Thereafter, Mukherjee (1932), Choudhuri (1961), Choudhuri & Roy (1965,'67), Hazra (1976,'84), Hazra & Choudhuri (1981), Hazra et al. (2007), Mandal (2011), Mitra et al. (1977) have studied collembola from different ecosystems of West Bengal.

Collembola were extracted from soil samples by employing stainless steel corers. The cores were then placed on modified high gradient extraction apparatus. Specimens were mounted under a coverslip in Hoyer's solution, and were studied under a Leica Digital Module (DM 2500) microscope. All specimens are deposited in the Apterygota Section, Zoological Survey of India (ZSI), Kolkata. Results are given in Table 1.

Acknowledgements : The authors are grateful to the Director, Dr. Kailash Chandra, Zoological Survey of India, Kolkata for giving opportunity to study the material and laboratory facilities. Thanks are also due to Dr. A. K. Hazra, ex-Emeritus Scientist, for encouragement and to the members of Apterygota section for their help and co-operation.

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Table 1. List of collembola from Indian Botanic Garden, Howrah.

	Family	Genus / species	Distribution
1	Hypogastruridae	1. *Willemia* sp.	West Bengal: Indian Botanic garden
2	Neanuridae	2. *Pseudachorutes* sp.	West Bengal : Indian Botanic garden
3	Tullbergidae	3. *Paratullbergia indica* Salmon, 1965	West Bengal: Indian Botanic garden; Kerala
4	Onychiuridae	4. *Allonychiurus indicus* (Choudhuri & Roy, 1965)	West Bengal: Indian Botanic garden
5	Brachystomellidae	5. *Brachystomella terrafolia* Salmon, 1944	West Bengal: Indian Botanic garden; Kerala
6	Isotomidae	6. *Proisotoma minuta* (Tullberg, 1871)	West Bengal: Indian Botanic Garden
		7. *Hemisotoma thermophila* (Axelson, 1900) Bagnall, 1949	West Bengal: Indian Botanic garden; Himachal Pradesh; Arunachal Pradesh; Sikkim; Kerala
		8. *Isotomurus ciliatus* Stach, 1947	West Bengal: Indian Botanic Garden
		9. *Isotomurus balteatus* (Reuter, 1876)	West Bengal: Indian Botanic garden; Uttaranchal; Arunachal Pradesh; Manipur; Odisha; Tripura
7	Entomobryidae	10. *Sinella curviseta* Brook, 1882	West Bengal: Indian Botanic garden; Himachal Pradesh; Uttar Pradesh; Arunachal Pradesh; Assam; Punjab; Sikkim
		11. *Lepidocyrtus (Ascocyrtus) scaber* Ritter, 1911	West Bengal: Indian Botanic garden
		12. *Lepidocyrtus (Cinctocyrtus) medius* Schaeffer, 1898	West Bengal: Indian Botanic garden; Jammu & Kashmir; Sikkim; Kerala, Manipur, Mizoram, Nagaland and Tripura
		13. *Lepidocyrtus (Ascocyrtus) magnificus* Carpenter, 1924	West Bengal: Indian Botanic garden; Jammu & Kashmir; Sikkim; Arunachal Pradesh; Manipur; Mizoram; Nagaland; Sikkim and Tripura
		14. *Pseudosinella petterseni* Borner, 1901	West Bengal: Indian Botanic garden; Kerala
		15. *Entomobrya* sp.	West Bengal: Indian Botanic garden
		16. *Seira indica* (Ritter, 1911)	West Bengal: Indian Botanic garden; Arunachal Pradesh; Assam; Nagaland; Maharashtra; Sikkim and Uttarakhand
8	Paronellidae	17. *Salina bengalensis* Mitra, 1973	West Bengal: Indian Botanic garden
		18. *Salina javana* (Handschin, 1928)	West Bengal: Indian Botanic garden
9	Cyphoderidae	19. *Cyphoderus albinus* Nicolet, 1842	West Bengal: Indian Botanic garden
		20. *Cyphoderus javanus* Borner, 1906	West Bengal: Botanic Garden; Darjeeling; Kerala; Maharashtra; Uttar Pradesh; Arunachal Pradesh; Manipur; Mizoram; Sikkim; Odisha
10	Nellidae	21. *Neelus murinus* Folsom, 1896	West Bengal: Indian Botanic Garden; Kerala
11	Arrhopalitidae	22. *Pygmarrhopalites habei* (Yosii, 1956)	West Bengal: Indian Botanic Garden; Sikkim
12	Dicyrtomidae	23. *Calvatomina pagoda* (Yosii, 1966)	West Bengal: Indian Botanic Garden
13	Sminthuridae	24. *Sphaeridia pumilis* (Krausbauer, 1898)	West Bengal: Indian Botanic Garden; Kerala; Uttar Pradesh; Maharashtra: Mumbai
		25. *Sminthurus viridis* (Linn., 1758)	West Bengal: Indian Botanic Garden

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Additions to the Moth Fauna of Sunderban Biosphere Reserve, India

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Moths are mostly nocturnal and cryptic insect belonging to Order Lepidoptera. Till date, 580 species accounting for nearly 5 percent of Indian moth fauna have been known to occur from West Bengal (Sanyal et al., 2012). The Indian part of Sunderban Biosphere Reserve (SBR) lies between 21°40′ and 22°09′ N latitude, and 88°01′ and 89°06′ E longitude and occupies land area 9630 sq km within the state of West Bengal. The knowledge on moth fauna of SBR is still scarce. Recently, Kumar et al. (2014), Mitra et al. (2014) and Biswas et al. (2016 a; 2016 b) have contributed manifold to the existing knowledge on Lepidoptera fauna of SBR. After perusal of above mentioned publications 46 species of moths (Table 1) have been found to occur in SBR.

Regular field surveys were conducted between 2015 and 2016 under the project "Role of Insect Pollinators on the conservation of major mangrove species in Sunderban Islands, West Bengal" funded by MoEF & CC, Govt. of India. This has resulted in getting the information of additional 49 species of moths (marked with * in Table 1) belonging to 45 genera and 14 families. All these species are recorded for first time from SBR. Among the 49 species of moths, 30 species (marked with # in Table 1) are recorded for the first time from West Bengal. Therefore, overall number of moth species including earlier published records and present record from SBR becomes 94 (including *Achaea janata* which was previously misidentified as *Parallelia onelia*) which constitute 17% of the recorded moth fauna of West Bengal.

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Table 1. List of Moths of Sunderban Biosphere Reserve.

	Species	Family
1.	*Azygophleps scalaris* (Fabricius, 1775)*#	Cossidae
2.	*Zeuzera coffeae* (Nietner, 1861)*	Cossidae
3.	*Zeuzera conferta* Walker, 1856*#	Cossidae
4.	*Botyodes asialis* Guenée, 1854*	Crambidae
5.	*Cnaphalocrocis medinalis* (Guenee, 1854)	Crambidae
6.	*Cnaphalocrocis trapezalis* Guenée, 1854*	Crambidae
7.	*Cryptographis indica* (Saunders, 1851)	Crambidae
8.	*Dolicharthria punctalis* (Denis & Schiffermüller, 1775)* #	Crambidae
9.	*Hymenoptychis sordida* (Zeller, 1852)	Crambidae
10.	*Leucinodes orbonalis* Guenée, 1854*	Crambidae
11.	*Nymphula responsalis* (Walker, 1865)*	Crambidae
12.	*Parapovnx fluctuosalis* (Zeller, 1852)	Crambidae
13.	*Parapoynx diminutalis* (Snellen, 1880)	Crambidae
14.	*Pycnarmon abraxalis* Walker, 1866*#	Crambidae
15.	*Sameodes cancellalis* (Zeller, 1852)	Crambidae
16.	*Scirpophaga bisignatus* Swinhoe, 1885	Crambidae
17.	*Scirpophaga incertulas* (Walker, 1863)	Crambidae
18.	*Scirpophaga nivella* (Fabricius, 1794)* #	Crambidae
19.	*Spoladea recurvalis* Fabricius, 1775*	Crambidae
20.	*Syngamia abruptalis* (Walker, 1859)	Crambidae

21. *Tetridia caletoralis* (Walker, 1859)*	Crambidae
22. *Ausaris argenteola* (Moore, 1858)* #	Drepanidae
23. *Achaea serva* (Fabricius, 1775)* #	Erebidae
24. *Achaea janata* (Linnaeus, 1758)* #	Erebidae
25. *Agylla remelana* (Moore, 1865)	Erebidae
26. *Amata cyssea* (Stoll, 1782)	Erebidae
27. *Amata passalis* (Fabricius)	Erebidae
28. *Amerila eugenia* (Fabricius, 1794)	Erebidae
29. *Amsacta emittens* Walker, 1855	Erebidae
30. *Amsacta lineola* (Fabricius, 1793)	Erebidae
31. *Anua coronata* (Fabricius, 1775)	Erebidae
32. *Arctornis submarginata* (Walker, 1855)*	Erebidae
33. *Argina astrea* (Drury, 1773)	Erebidae
34. *Artena dotata* Fabricius, 1794	Erebidae
35. *Asura undulosa* (Walker, 1854)	Erebidae
36. *Brunia antica* (Walker, 1854)* #	Erebidae
37. *Caeneressa diaphana* (Kollar, 1844)	Erebidae
38. *Ceryx godartii* (Boisduval, 1829)	Erebidae
39. *Creatonotos gangis* (Linnaeus, 1763)	Erebidae
40. *Creatonotos transiens* (Walker, 1855)*	Erebidae
41. *Eressa discinota* Moore	Erebidae
42. *Ericeia inangulata* (Guenee, 1852)	Erebidae
43. *Eudocima hypermnestra* (Cramer, 1780)* #	Erebidae
44. *Eudocima materna* (Linnaeus, 1767)* #	Erebidae
45. *Grammodes geometrica* (Fabricius, 1775)	Erebidae
46. *Hamodes propitia* (Guerin, 1830)* #	Erebidae
47. *Homodes crocea* Guenée, 1852*#	Erebidae
48. *Hulodes caranea* (Cramer, [1780])* #	Erebidae
49. *Ischyja marapok* Holloway, 2005*#	Erebidae
50. *Mocis frugalis* (Fabricius, 1775)* #	Erebidae
51. *Orgyia postica* (Walker, 1855)*	Erebidae
52. *Psichotoë duvauceli* Boisduval, 1829*	Erebidae
53. *Spilosoma obliqua* Walker, 1855	Erebidae
54. *Spirama retorta* (Clerck, 1764)	Erebidae
55. *Thyas honesta* (Hübner, 1806)*	Erebidae
56. *Trigonodes hyppasia* (Cramer, [1779])* #	Erebidae
57. *Utetheisa lotrix* (Cramer, 1779)	Erebidae
58. *Utetheisa pulchella* (Linnaeus, 1758)	Erebidae
59. *Eupterote hibisci* (Fabricius, 1775)	Eupterotidae
60. *Agathia lycaenaria* (Kollar, 1844)	Geometridae
61. *Cleora determinata* Walker, 1860*#	Geometridae
62. *Cleora injectaria* (Walker, 1860)* #	Geometridae
63. *Gonodontis clelia* (Cramer, [1780])* #	Geometridae
64. *Hyposidra talaca* (Walker, 1860)*	Geometridae
65. *Timandra correspondens* Hampson, 1895*#	Geometridae
66. *Hyblaea puera* (Cramer, 1777)	Hyblaeidae
67. *Kunugia latipennis* (Walker, 1855)*	Lasiocampidae
68. *Streblote siva* Lefebvre, 1827*	Lasiocampidae
69. *Altha nivea* Walker, 1862	Limacodidae
70. *Thosea cana* Walker, 1865	Limacodidae
71. *Thosea tripartita* Moore, 1884	Limacodidae
72. *Asota ficus* (Fabricius, 1775)*	Noctuidae
73. *Asota producta* (Butler, 1875)	Noctuidae
74. *Aucha velans* (Walker, 1857)	Noctuidae
75. *Chasmina candida* (Walker, 1865)* #	Noctuidae
76. *Leucania compta* (Moore, 1881)* #	Noctuidae
77. *Lophoptera costata* (Moore, 1885)* #	Noctuidae
78. *Paectes subapicalis* (Walker, [1858])* #	Noctuidae
79. *Prospalta dolorosa* (Walker, 1865)* #	Noctuidae
80. *Spodoptera litura* (Fabricius, 1775)	Noctuidae
81. *Gadirtha pulchra* (Butler, 1886)* #	Nolidae
82. *Norraca longipennis* Moore, 1881*#	Notodontidae
83. *Eumeta crameri* (Westwood, 1854) *#	Psychidae
84. *Canthelea oegnusalis* (Walker, 1859)	Pyralidae
85. *Herculia marthalis* (Walker, 1859)* #	Pyralidae
86. *Hypsipyla robusta* (Moore, 1886)	Pyralidae
87. *Actias selene* (Hubner, 1806)	Saturniidae
88. *Antheraea paphia* Linnaeus, 1758	Saturniidae
89. *Acherontia lachesis* (Fabricius, 1798)	Sphingidae
90. *Hippotion celerio* (Linnaeus, 1758)	Sphingidae
91. *Theretra latreillii* (MacLeay, [1826])*	Sphingidae
92. *Theretra silhetensis* (Walker, 1856)	Sphingidae
93. *Micronia aculeata* Guenée, 1857*	Uraniidae
94. *Thyrassia subcordata* Walker, 1854	Zygaenidae

* New record to SBR. # New record to West Bengal.

Pudina

Pudina (mint leaves) aid in digestion, improves oral health, treats cold and more, say experts.

Here are some benefits:

• Mint leaves are loaded with anti-oxidants and phytonutrients which provide relief to the stomach muscles and help in digestion. It soothes the stomach instantly, works wonders when it comes to treating tummy troubles.

• The herb is a naturally soothing substance, so it can alleviate the inflammation that is often associated with headache and migraines.

• It has germicidal qualities and freshens breath, it adds to oral health by inhibiting harmful bacterial growth inside the mouth and by cleaning tongue and teeth.

• Pudina can treat cough and cold.

• The anti-inflammatory and anti-bacterial properties work wonders for acne-prone skin.

Phthalates—Exposure and Risk to the Human Health

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Introduction

Plastics are important in all walks of life from the cradle to the deathbed. The increasing use of plastics has been accompanied by concerns about the impact of chemical ingredients leaching from plastic containers during use and after disposal on the health of human beings and entire ecosystems. The wide spread use of plastics has been made possible by the development of suitable additives that confer desired properties to plastics. Phthalates like Di-2-ethylexyl phthalate (DEHP) are a group of additives that are used in plastics like Poly vinyl chloride (PVC) and Polyethylene Terephthalate (PET). DEHP is present in plastics used for making medical devices like blood bags, catheters and tubing. In this review author has limited to a discussion of the risks posed by phthalates that have been reported in scientific literature.

Exposure to Phthalates

Phthalates are one of the most abundant man made environmental pollutants. They are diesters of phthalic acid and are used widely in cosmetics, adhesives and as solvents. In plastics, phthalates are used to impart flexibility. They are not chemically bound to the resin and can be released relatively easily (Yuan & Graham, 2008). The leaching of phthalates is affected by several factors like the concentration of free phthalates in the plastics, usage of the container, duration and condition of storage, the characteristics of the polymer resin etc. Human exposure to phthalates can occur from multiple sources and through different routes.

Wilkinson & Lamb (1999) compared the accepted daily intake (ADI) of Di isononyl phthalate (DINP) with estimates of exposure in children through toys. They observed that against an ADI of 1-4 mg/kg/ day the estimated 95th percentile exposure was 94.3 µg/kg/day.

The ADI level for DEHP is 37 µg/kg /day (Koo & Lee, 2004). Shea (2003) reported that the maximum estimated intake of DEHP was 19 µg/kg /day and was observed in children between 6 months to 4 years of age. After 4 years of age, the level of exposure progressively decreased as summarised in the Table 1 below. In all age groups food was the major source of exposure to DEHP, accounting for over 80% of the total exposure.

Blount et al. (2000) measured the monoester metabolites of common phthalates in human urine samples. They expressed concern that the highest levels of the metabolite they measured was found in women of childbearing age. Based on these measurements David (2000) and Kohen et al. (2000) have independently reported the estimated daily intake of different phthalates.

Biological effects of Phthalates

Kluwe et al. (1982) studied the carcinogenic potential of multiple phthalic acid esters on rats and mice. Their study suggested that each ester might have a different mode of action. They also concluded that all phthalic acid esters had a hepatocarcinogenic effect in mice with female mice being more susceptible than males. Ward et al., (1986) studied the tumour initiating and promoting effect of DEHP in mouse and rat animal models in vivo and in mouse epidermis derived JB6 cell lines in vitro. DEHP promoted pre-initiated hyperplastic lesions and neoplastic foci in mice but not in rats. They identified DEHP as a weak complete promoter and a definite second stage promoter. DEHP and its metabolite mono (2-ethylhexyl) phthalate (MEHP) promoted JB6 cells in vitro to anchorage independence (Jobling et al., 1995). In vitro studies by Jobling et al. (1995) have identified BBP and DBP as estrogenic. They also suggest that in the presence of endogenous estrogens the overall effect of these two chemicals would be cumulative. Klaunig et al. (2003) analyzed the bioassay data related to peroxisomal proliferation in vivo and concluded that rodents are more sensitive than primates to

Table 1. Variation in estimated intake of DEHP in different age groups.

	Age (years)				
	0.0 - 0.5	0.5 - 4.0	5.0 -11.0	12.0 -19.0	20.0 - 70.0
Estimated intake (µg/kg/day)	8.9-9.1	19	14	8.2	5.8
Estimated exposure from food (µg/kg/day)	7.9	18	13	7.2	4.9

peroxisomal proliferators. In another study Akingbemi et al. (2004) reported that DEHP increased serum 17 Beta estradiol concentrations by 50%. Shea (2003) concluded that there was disagreement about the exact mechanism by which DEHA and DINP caused cancer and that there were indications that the carcinogenic risk to human beings was lower than that to animals. Rusyn et al. (2006) have supported the hypothesis that DEHP may cause cancer in animal models by peroxisome proliferation.

Recommendations

The leaching of phthalates from medical devices and containers is an area of gravest concern. While one scientific evaluation of the harmful potential of phthalates concludes that DEHP, as used in medical devices, "is unlikely to pose a health risk to even highly exposed humans" (Koop et al., 1999) the other concluded that "the weight of the evidence indicates a significant potential for serious adverse effects on human health from DEHP-containing medical devices" (Tickner et al., 1999). Tickner et al. (2001) have commented on the uncertainty prevailing about the mechanism of action of phthalates and the risk posed by the possibility of inter-individual variability. They recommend a move to safer alternatives to DEHP and PVC in medical devices. Plastics have made an immense contribution to the human society. The current quest is to find safer and environmentally benign products. Given that human beings are likely to be exposed to a cocktail of phthalates, more realistic results would be obtained through studies probing the effect of a mixture of phthalates, mimicking the real life exposure conditions (Kortenkamp & Faust, 2010).

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Table 2. Estimated daily exposure (µg/kg/day) to some phthalates.

	David (2000)			Kohn et al. (2000)		
	Geometric mean	95th percentile	Maximum	Median	95th percentile	Maximum
DEP	12.34	93.33	241.81	12	110	320
DBP	1.56	6.87	116.96	1.5	7.2	110
BBP	0.73	3.34	19.79	0.88	4.0	29
DEHP	0.60	3.05	38.48	0.71	3.6	46
DINP	0.21	1.08	14.35	Below limit of detection	1.7	22

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Water has Vanished in last 32 years

Aral Sea accounts for biggest loss; Iraq loses third of water area; Iran and Afghanistan a half of theirs.

Ninety thousand sq km of water—the equivalent of half of the lakes in the Europe—has vanished from the surface of the Earth since 1984, according to new research.

Google has teamed up with the European Commission's Joint Research Centre to analyse 3 million satellite images, going all the way back to 1984.

The project has been a monumental undertaking and was made possible by new data processing methods, running the analysis of thousands of high performance computers simultaneously.

It took 3 years to download 1.8 petabytes of data from the USGS / NASA Landsat satellite programme and prepare it for analysis. Each pixel in the image was then examined by a computer algorithm developed by the Joint Research Centre running on the Google Earth Engine platform.

More than 10 million hours of computing time was needed for this—roughly equivalent to a modern 2-core computer running day and night for 600 years.

Eventually, Google was able to map changes in the water surface over time with a 30-metre accuracy, month-by-month, over 32 years and the findings are very alarming.

According to the images, the continuing drying up of the Aral Sea in Uzbekistan and Kazakhstan accounts for the biggest water loss in the world.

Iran and Afghanistan have also lost over a half of their water area, and Iraq has lost over a third.

Although the area covered by water in the USA has increased a little, a combination of drought and sustained demand for water have seen six western states—Arizona, California, Idaho, Nevada, Oregon, Utah—account for a third of the loss in US water surface. Meanwhile, more than 13,000 sq km of the Mississippi delta—an area 10 times the size of London—is slowly slipping into the Gulf of Mexico.

These new maps and statistics provide essential information which can aid global water security, agricultural planning, disaster preparedness, and climate understanding, said Noel Gorelick, Chief Extraterrestrial Observer at Google Earth Engine, in a blog post.

Research Notes

RECURRENCE OF *PLATYPALPUS GENTILIS* AFTER A CENTURY FROM WEST BENGAL, INDIA (DIPTERA: HYBOTIDAE)

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The members of the family Hybotidae are commonly known as dance flies which belong to the superfamily Empidoidea (Pape et al., 2011). This group was previously included as subfamily Hybotinae under family Empididae (Smith, 1975). Tachydromiinae in which the species *Platypalpus gentilis* Brunetti belongs, can be separated from other subfamilies by the absence of anal cell or incomplete anal vein, presence of three posterior cells, absence of discal cell and styliform arista.

The species under discussion was described by Brunetti (1913) as *Platypalpus gentilis*, but later transferred under the genus *Tachydromia* and included four other species *latifascipennis, ferruginea, nepalensis* and *orientalis*. Later on, Smith (1975) again mentioned the species *gentilis, ferruginea, nepalensis* and *orientalis* under the genus *Platypalpus*, but left *latifascipennis* in *Tachydromia*.

Literature reveals that many species of this family are predaceous and this species feeds on particularly small dipteran flies including larvae which could be found in soil, rotten wood and dung (Brunetti, 1920, Datta & Parui, 1992). All the species of this genus have so far been recorded from high altitudinal areas. Many other species of several genera are best represented in the Himalaya (Datta & Parui, 1992).

The species *Platypalpus gentilis* has been recorded from Shimla and Darjeeling Himalayas by Brunetti (1913). The present record has been made again from Darjeeling area after a long gap of a century and it may be assumed that the preference of this species is to be present in the high altitudinal areas.

Order Diptera
Superfamily Empidoidea
Family Hybotidae
Subfamily Tachydromiinae

***Platypalpus gentilis* Brunetti, 1913**

1913. *Platypalpus gentilis* Brunetti. *Rec. Indian Mus.*, ix: 40.

Type-locality : India: West Bengal : Darjeeling.

Material examined: 1ex., India, West Bengal, Darjeeling dist., Sonada, 16.v.2015. coll. N. Pradhan.

Diagnosis: The genus *Platypalpus* Meigen, 1803 includes five species in India (Brunetti, 1920) of which the present species differs from its closest species *P. orientalis* by its long proboscis being as long as head height and palpi half, as long as the former; thorax shining black bearing sparse yellow hairs and its lateral bristles; abdomen black; legs pale yellowish brown, mid femur incrassated with two rows of small black spines below; wings clear.

Distribution: Himachal Pradesh (Shimla) and West Bengal (Darjeeling).

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Ban on Chinese 'Manjha'

The National Green Tribunal imposed a nationwide interim ban on the procurement, sale and use of glass powder-coated 'manjha' and other dangerous kite strings.

Also called 'Chinese manjha'—as well as synthetic/ cotton thread coated with glass powder or other hazardous compounds is now banned. Kite strings not only posed a threat to birds, animals and humans, sometimes fatal, but also caused harm to the environment.

TRIBE NAME *TEINOPALPANI* IS INVALID (LEPIDOPTERA : PAPILIONIDAE)

R. K. VARSHNEY

A Biologists Confrerie,
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Recently I came across a paper by Soibam (2016), wherein the beautiful Kaiser-i-Hind butterfly *Teinopalpus imperialis* Hope has been recorded from Manipur, north-eastern India.

The author has therein reported the higher classification as "Lepidoptera: Teinopalpani" (sic) in the title as well as in the text. Unfortunately, the mentioned tribe name is incorrect and invalid, as per nomenclature rules.

Under the zoological nomenclature rules, all family-group names must end as follows: family name with suffix '-idae,' subfamily name with '-inae', tribe name with suffix '-ini', and now as per the latest edition of the International Code, the subtribe name with suffix '-ina'.

The correct classification for the *Teinopalpus imperialis* is thus, Order Lepidoptera, Family Papilionidae, Subfamily Papilioninae, Tribe Teinopalpini, as shown by me earlier (Varshney, 2010).

Therefore, tribe name 'Teinopalpani' is invalid and must be corrected as Teinopalpini.

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Letters

Approved by U. G. C.

[In the recent list of approved journals for scientific publications, U. G. C. has included *Bionotes* in following style.]

Welcome to UGC, New Delhi, India

Sr.: 8653 [or 9515]; Title: Bionotes; Source: ICI; Subjects: Biological Science; Broad Category: Science; Publisher: A Biologists Confrerie; ISSN: 09721800; E-ISSN: [Blank]; Country: India; New Added: [Blank].

—University Grants Commission, New Delhi.

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I hope that you still remember me as we last met in DRS Jodhpur conference about an year ago, although I, as an odonatologist, have been often referencing all your works during 1980-1990, some of which with my very respected friends, Dr M. Prasad and R. Ram.

The reason I am writing this email is that one of my friends, Dr Matti Hamalainen from Helsinki Univ., Finland, is working on "Eponyms of World Odonata", and he is stuck up with *Ictinogomphus kishori* Ram, thinking that it is me (as my name, Brij kishore Tyagi, bears a near similar word; obviously it can't be me since my middle name has a different spelling...) in whose honour the species was formed, although I am more than sure that the species name, *kishori*, was erected in the honour of some other person bearing the word "kishor" in his name.

Mr. R. Ram has worked with you, besides Dr. M. Prasad and Dr. R.K. Yadav (as evident in his publications), and I am wondering if you knew of the person in whose honour Dr. Ram had erected this species, *Ictinogomphus kishori* Ram, 1985 [Ram, R., 1985. Two new species of *Ictinogomphus* Cowley (Anisoptera: Gomphidae) from India. (Ed.: S. Mathavan), *Proceedings of the First Indian Symposium of Odonatology*, Madurai, pp. 175-184]?

I will be most grateful if you could kindly clarify this point, preferably by return of mail, specifying the person in whose name the species, *Ictinogomphus kishori* Ram, could have been erected. Thank you.

I will be further grateful if you could pass on to me the mob. nos. of both Dr. M. Prasad and Dr. R. Ram? Thank you so much, once again.

—Prof. Dr B.K. Tyagi
Jodhpur.

●●●

1er Congrès International
de Protection des Plantes dans
les Agroécosystèmes Méditerranéens
Invasions Biologiques Dans Les Agroecosystemes
Mediterraneens
1st International Congress
for Plant Protection
in Mediterranean Agroecosystems
Biological Invasions in Mediterranean Agroecosystems
16-20 juillet 2018
16th to 20th July 2018

—Germain Jean-Francois, Ph.D.
Entomologist, Plant Health Laboratory, Montpellier
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FRANCE-34988 Montferrier-sur-Lez Cedex.

●●●

Stealing Bee hives

New Zealand's bees were being stolen and traded by organised crime syndicates seeking to profit from sky-rocketing honey prices, police said. This is the new gold rush, Laurence Burkin, manager at The True Honey Co. said.

Hive heists were rising, with 400 bee or honey thefts reported in the six months to January, police said. The crime spree comes while NZ's honey industry is booming. Exports jumped 35% to $219 million in the year to June. A native product prized for its antibacterial properties, Manuka honey fetches as much as NZ $148 per kg.

MORTALITY IN BOTH SEXES OF MUTANT STRAIN (CURLED) OF *DROSOPHILA MELANOGASTER* AFTER *NICOTIANA TABACCUM* INTOXICATION

SHAMIM AKHTER

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Jammu (J. & K.).

Drosophila melanogaster is effectively used in experimental studies due to many advantages, viz its short life span. In the present study, effect of extract of *Nicotiana tabaccum* has been observed in the mortality of adults of Curled strain of *Drosophila melanogaster*.

A pure culture of curled strain was obtained from the Drosophila Stock Centre, Indore. The culture was maintained on artificial diet consisting of Corn flour, Sugar, Nepazine, Yeast, Propionic acid, 70% Alcohol and distilled water, which was prepared according to the method described by Aijaz et al. (1987). The flies were used after 5-6 generations when they were fully acclimatized to the laboratory conditions at 25±5°C.

LC_{50} was determined and sub-lethal dose (0.312µl/100ml food) was selected and given to treated (T) sets, whereas control set was not given any treatment.

The data obtained shows that *Nicotiana* affects both male and female adults of curled strain. The females depict the maximum mortality on the basis of low resistance power to tolerate the effect of extract of *Nicotiana tabaccum*.

These findings gain support by Razdan (2001), Luning (1966) and Choudhary (2002). Table 1 shows that mortality of adults of second set is more as compared to first, third and control sets respectively. Sexual emergence shows significant decreases as compared to control. In the present findings the mortality of both sexes has been increased due to test chemical only because all other factors were not variable but were kept constant. The reduction in sexual emergence may be due to the effect of test chemical on the apolytic process of the insect, vide Krishnamurthy et al. (1998), Razdan & Yadav (2001) and Laamanen et al. (1976).

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Table 1. Sexual effectiveness of mutant strain (curled) of *Drosophila melanogaster* after intoxication with extract of *Nicotiana tabaccum*.

Sets	No. of Sets	Mortality of Males (Mean±S.E.)	Mortality of Females (Mean±S.E.)	%Mortality of Males (Mean±S.E.)	%Mortality of Females (Mean±S.E.)
T♀ x U♂	3	15.00±1.41	24.33±1.08	22.69±1.42	30.02±1.19
T♀ x T♂	3	16.00±0.70	37.33±1.08	39.64±0.74	66.25±0.64
U♀ x T♂	3	10.00±0.70	18.00±0.70	12.07±1.56	19.13±0.56

T—Treated; U— Untreated.

India's Diverse Culinary Heritage
A Museum of Indian Food Heritage and Rare Recipes

RHYTHMA KAUL and ANESHA GEORGE
E-mail : *rhythma.kaul@hindustantimes.com*

Why is tadka added to dal? It's not just for flavour.

"The oil helps the body assimilate fat-soluble nutrients—which is very important in a predominantly plant-based diet," says food consultant Rushina Munshaw-Ghildiyal.

Across India's regional cuisines, there is a precise, almost mathematical, logic to traditional foods, combinations and meals. And much of it being lost to fast food, packaged snacks and foreign fads posing as superfoods.

The mismatch is partly why rates of obesity and metabolic disorders are up.

"The nutritional value of the food we ingest has dropped drastically," says Mumbai nutritionist Shikha Gupta. "Whole cereals, for instance, are all but missing from the urban Indian diet."

The Food Safety and Standards Authority of India (FSSAI) has decided to act as the country faces the loss of its diverse culinary heritage and micro-cuisines and is now planning a museum of Indian food heritage and what they're calling '*bhoole-bisre*', 'rare' 'heritage' recipes.

"There is currently no one place where information on India's rich food traditions, heritage and customs can be sought. We are having discussion to come up with a concrete plan for such a space," says FSSAI CEO Pawan Kumar Agarwal. "We want to create a repository that will offer cultural context, nutritional and even pharmaceutical values of Indian cuisines. It won't be about dishes and taste alone but the science of food."

The plan is to rope in food scientists and historians, chefs, food revivalists and other national and multinational experts in the field. Also in the works are traditional food festivals, talks, seminars, and food trails.

"Currently, restaurants and hotels are promoting certain cuisines individually, but through this initiative we plan to go beyond the niche and reach out to the masses," Agarwal says.

First Foods

The independent efforts are coming from various sources.

The Centre for Science and Environment (CSE), a Delhi-based thinktank, recently released a book titled *First Food : Culture of Taste*, a collection of 50 recipes that used traditional, seasonal produce.

"We have a living tradition of healthy food still eaten in our homes. We still cherish diverse cuisines and we will crave for our unique smells and tastes. But knowledge of this diversity is disappearing...our food is getting multinationalised, industrialised and chemicalised," reads the foreword.

"We decided to put together the book because we were getting exceedingly concerned about how Indians were consuming processed food and how there was a lack of diversity on their plates," says CSE director-general Sunita Narain.

The globalisation that caused us to lose touch with our culinary traditions, ironically, is bringing some of them back. As Indian 'superfoods' draw attention globally, ironically, they are becoming more easily available locally again.

"Millets like *jowar, bajra* and *ragi* are now being called superfoods and are a perfect balance of minerals, fats and carbohydrates. They can be used in everyday cooking, be it porridges, pancakes, *halwas*, or *upmas*. They are available all year round, and as demand rises once more, are making a comeback in supermarkets and e-groceries," says Mumbai nutritionist Dhvani Shah.

Ghildiyal has one such superfood family recipe that she has both adopted and adapted for meals today.

"My husband's great-grandmother made a delicious *saag* with the husk of sesame seeds that would be eaten with rice," she says. "It was a traditional Garhwali dish usually had in winter. This husk is extremely rich in Vitamin B1, iron and calcium."

She now makes a light soup version, so that it can be had in summer as well.

Peepal Patte ki Bhaji

Towards the end of the March, tender pink leaves appear on the peepal tree (*Ficus religiosa*). These heart-shaped leaves are a favourite of the Baiga tribe of Madhya Pradesh. They're known to help the body deal with very hot summers by aiding digestion and thus keeping the body from overheating as it tries to digest each meal. The bitter leaves make for an intersting vegetables. Boil until soft, strain, add tamarind for a kick of sourness. Cook with a little water until melded. Add salt. Serve with rice.

Flaxseed Chutney

Oil seeds such as flaxseed are rich in Omega-3 fatty acids, fibre, antioxidants, vitamins and minerals such as calcium, iron, magnesium and zinc. They boost immunity and stamina.

For the chutney, take 100gm flaxseeds; 6-8 dry red chillis; 2-3 tsp cumin seeds (optional); salt to taste. Roast flaxseeds lightly in a pan until they stop crackling. Roast chillies and cumin seeds separately. Let all ingredients cool and grind them into a coarse powder. Add salt. Store the dry chutney in an air-tight container.

New Publications

Book Review

Clues In Your Chromosomes

THE TELOMERE EFFECT: LIVING YOUNGER, HEALTHIER, LONGER. Author: Elizabeth Blackburn and Elissa Epel. Publisher: Hachette. Price: Rs. 499.

The first strand of grey at your temples may have more to say about the state of your health than you know.

Australian-American molecular biologist Elizabeth blackburn, who received a Nobel Prize (for Physiology or Medicine, in 2009) for the discovery of telomerase and telomeres' role in the aging process, breaks down this phenomenon in a book co-authored with psychologist Elissa Epel.

The Telomere Effect: Living Younger, Healthier, Longer, starts by introducing the protagonist of this tale, the telomeres.

These are the protective tips at the end of chromosomes, the carriers of genes. The analogy used is that of the shoelace and its tip. As with the shoelace, the health of the chromosome is linked to the health of the telomere.

As telomeres shorten, we get weaker and fall into the "diseasespan" or the stage of falling sick easily and developing long-term medical conditions.

The heartening revelation and key takeaway from the book is that this shortening of telomeres can be both checked and controlled.

As the authors put it: "You can start to renew your telomeres, and your cells, right now."

The painstaking details could get a little tedious for those not scientifically inclined. But essentially it all comes down to exercise, diet, stress and sleep.

This may not be new information, but the ways in which our mismanagement of our bodies is affecting them at a cellular level can make for riveting reading.

"One study has found that people who tend to focus their minds more on what they are currently doing have longer telomeres than people whose minds tend to wander more," the book states.

Stress, anxiety, inactivity, bad diets all lead to shortening of telomeres. Reverse the bad habits, and you can even start to undo some of the damage.

Incidentally, exercise without a healthy diet, the authors say, is inadequate.

Sugary drinks, red meat and processed meat need to go altogether, and be replaced with vegetables, whole food, nuts and fish with omega 3 fatty acids. Coffee and tea, they say, can stay. Also vital: seven hours of sleep.

In a time of health vs wealth, the book also offers an interesting lens through which to view the health of the individual and the health of society.

—Dipanjan Sinha

Sarus Crane Population rises in U. P.

In keeping with the trend of the past five years, the population of sarus crane has marginally increased from 143 to 158 in the past one year in Bareilly area. The survey also revealed that the state bird of Uttar Pradesh faces increasing threats from insecticides and chemical fertilisers present in the most water bodies. In Aonla, industrial waste is the main reason which is threatening the bird.

Sarus crane is considered as a vulnerable species under schedule IV of the Wildlife Act, 1972, by the International Union for Conservation of Nature and Natural Resources (IUCN).

Due to increased awareness among locals, especially, farmers, people have now adopted measures to protect the eggs. Earlier, children and even adult people used to destory the eggs, and stray dogs would also eat these eggs.

The crane lays eggs on paddy fields and wetlands. The bird feeds on small insects, worms and water weed and if their food gets contaminated, the crane falls sick.

The bird is considered the tallest flying bird in the world. Its standing height is approx. 156 cm. The crane builds its nest in June-July in marshy areas by using paddy straw, leaves and twigs. The breeding period is August-September, and the female crane usually lays two eggs at a time.

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