



The BLUE JAY SCIENCE MAGAZINE

<http://sites.google.com/site/thebluejayscienceclub>

July 2009

EDITORIAL

Dear readers,

The whole world looks different through the eyes of small kids. Their imagination is not bound by the knowledge of facts. Their perspectives do not dwell up on consequences for the self. They do not see man as the master of universe. This issue of BJSM celebrates the thoughts of the youngest members of our Club. This issue discusses the concerns about protecting wildlife, saving energy and the environment. With all the tiny and keen efforts, we wish you a happy reading.

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NEWS BYTES

Nitrates May Be Environmental Trigger for Alzheimer's, Diabetes and Parkinson's Disease

A new study by researchers at Rhode Island Hospital have found a substantial link between increased levels of nitrates in our environment and food with increased deaths from diseases, including Alzheimer's disease, diabetes mellitus and Parkinson's disease. They are found in many food products, including fried bacon, cured meats and cheese products as well as beer and water. Exposure also occurs through manufacturing and processing of rubber and latex products, as well as fertilizers, pesticides and cosmetics.

Potential New Drugs: 970 Million And Still Counting

Like astronomers counting stars in the familiar universe of outer space, chemists in Switzerland are reporting the latest results of a survey of chemical space — the so-called chemical universe where tomorrow's miracle drugs may reside. The scientists conclude, based on this phase of the ongoing count, that there are 970 million chemicals suitable for study as new drugs.

Inexpensive Thin Printable Batteries Developed

For a long time, batteries were bulky and heavy. Now, a new cutting-edge battery is revolutionizing the field. It is thinner than a millimeter, lighter than a gram, and can be produced cost-effectively through a printing process. The battery contains no mercury and is in this respect environmentally friendly. It is 1.5 V and composed of different layers: a zinc anode and a manganese cathode, among others. Zinc and manganese react with one another and produce electricity. However, the anode and the cathode layer dissipate gradually during this chemical process. Therefore, the battery is suitable for applications which have a limited life span or a limited power requirement, for instance greeting cards.

Courtesy – ScienceDaily

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Protection of Wildlife & Endangered Species

Ananya

Will you not leave us here too long
We have not paid attention
To squander the best of the world
A pity we do not understand
Ourselves
No more you fly in the wind
No more the buoyant ripples on a pristine pool
The splash of color in a worn-tore land
No more
The survivor's sad lament
Yet no weeping will there be when
Your perfect, singular form
Vanishes
The muted salting of a wounded Earth
And all that is and all that ever was will
In some way be
Diminished
For the loss, though unnoticed
Will be recognized
In the stillness of eternal night.

-Laurence Overmire, "Ode to an endangered species"

Key Threats to Wildlife

1. Habitat Loss: Because our population is growing and our cities are sprawling into the countryside, fewer natural wildlife habitat areas are left each year. And the habitat that remains has often been degraded to bear little resemblance to the natural

wild areas, which existed in the past. In many areas, only islands of habitat remain, isolated in the middle of large agricultural or urban developments - preventing normal interactions, healthy breeding or safe travel for many species. Some wildlife species, such as deer, rabbits and chipmunks, are adaptable to many conditions, but other creatures have very specific food, moisture and temperature requirements. These are the endangered species which we risk losing if we don't preserve adequate amounts of habitat for their survival.

QUIZ CORNER

How much gold is present in 1 carat?

Answer to June 2009 Puzzle Corner: **Liver**

2. **Climate Change:** Because many types of plants and animals have specific habitat requirements, climate change could cause disastrous losses of wildlife species. A one or two degree change in average annual temperature will translate into large changes, affecting snow cover in the winter and excess heat in the summer. Many northern hemisphere plants and animals depend on a blanket of snow to insulate them from extreme low temperatures of winter. It may be 25 degrees below zero in the open air, but barely freezing (32 degrees) beneath the snow. Without this insulation, many plant species (even trees) will decline or disappear entirely. Hibernating mammals, reptiles, amphibians and insects will be harmed also. Similarly, higher temperatures would increase evaporation year round, and may reduce rainfall, leading to drier than normal conditions across the state. Plants and wildlife are sensitive to moisture changes, so they will be harmed by this dryness. Coldwater trout streams may become too warm to support trout, or may dry up. Unfortunately, trees and plants can't simply pick up and move to a more hospitable location. Instead, they will die where they stand, exposing and starving the wildlife that depend on them. Drought tolerant plants and trees will gradually spread to replace them by seed, but this process takes time. In many parts of world, natural habitat is chopped up and isolated in small islands. This means plants and animals have no bridge to allow them to move with the changing climate.

3. **Pesticides and Toxic Chemicals:** Pesticides are deliberately spread to make the environment toxic to certain plants, insects or rodents, so it shouldn't be surprising that other plants and wildlife are often harmed at the same time. While many of the worst pesticides have been outlawed in the past 30 years, scientists have found numerous worries with several

pesticides which are still legal and commonly used. In addition, many chemical pollutants are toxic to wildlife, such as PCBs, mercury, petroleum byproducts, solvents, anti-freeze, etc.

4. **Non-native Species:** Many non-native plants, mollusks, insects, fish, birds, mammals, and diseases can find their way to indigenous wildlife. These "aliens" are often aggressive competitors with native wildlife, or predatory, especially after they've left their own natural environments and controls.

5. **Mismanagement:** Some native wildlife can become a problem when released from their natural population controls. When wolves are scarce and hunters too few, white-tailed deer will often strip the woods of native wildflowers (such as Trilliums) and even certain tree species (such as Hemlock), when their populations are allowed to become too high. Canada geese are beautiful birds, but when cityfolk feed native geese as if they were pets, their populations can rise to uncomfortable levels in urban areas, resulting in polluted waterways and manure-laden lawns. Gulls can become similar problems, when they scavenge for scraps from our garbage heaps and landfills.

How You Can Help Wildlife

1. **Live in the City ---** Many of us yearn to live in the country, so we can be closer to nature and enjoy the peace and quiet. It's ironic that this urge is actually destroying thousands of acres of wildlife habitat each year. We need to develop a new environmental ethic, encouraging everyone to stay in the cities. We need to make cities more liveable and leave the remaining wild areas to the wildlife.

2. **Support Strict Zoning:** Land use zoning is one of the few tools available to the government to protect wetlands, natural areas and environmental corridors. Unfortunately, such zoning is often opposed by powerful land development or political forces. It's important for citizens to show support for zoning to balance against these negative pressures.

3. **Support Organizations Preserving Rare Properties:** Several groups specialize in buying and maintaining pieces of significant wildlife habitat which are threatened with development

4. **Create Habitat in Your Backyard:** You can help sustain wildlife in your own backyard, with careful selection of native plants, trees, structures, nest boxes, water and food.

5. **Conserve Energy:** We must work together to reduce our energy consumption. This is vital to stopping climate change and global warming. Energy conservation also reduces direct habitat losses (from

coal mining, oil drilling and oil spills) and toxic pollution to air and water, which all threaten wildlife.

6. Limit Your Family Size: Each person requires space and natural resources to live. Our human population is rapidly rising to levels which make it difficult to provide adequate resources for humans while sustaining a healthy environment for wildlife. If each couple limited themselves to no more than 2 children, our world's population could stabilize and support everyone without conflict or suffering.

7. Get Involved and Talk to Your Legislators: Many of our current governmental regulations are not helpful for preserving wildlife habitat or conserving energy, and some policies actually reward large energy users with lower bulk rates. Citizens need to contact their legislators and ask for better policies.

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WEB FOCUS

Edugreen is the environmental education portal of The Energy and Resources Institute (TERI). Visit: <http://edugreen.teri.res.in/>

SCIENCE CAPSULE

Why does it feel good to scratch an itch?

Sushil Kumar Garnayak

Almost every time we feel an itch, our hands go to scratch it over. And we feel better. What's there in scratching...medicine? Underneath our skin, there exist very sensitive and rapidly adapting nerve endings that elicit a tickle or an itch sensation. These sensations are transmitted by very small unmyelinated nerve fibers called C-fibres, similar to those that transmit slow type of pain. The purpose of an itch sensation is to draw attention to mild surface stimuli such as an insect crawling on the skin or a mosquito about to bite. Such sensation is followed by the scratch reflex that helps us get rid of the irritant. If the scratch is strong enough to elicit small pain, it relieves us from the itch. The pain signals are believed to suppress the itch signals in the spinal cord by a special mechanism called *lateral inhibition*. Thus the impulses generated by scratching distract the brain from those generated due to itch. Though scratching is helpful in relieving the itch, it offers only temporary relief and may cause the skin to become further irritated and possibly tear, which could result in an infection. When scratching becomes continuous or chronic, medical advice should be taken.

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HEALTH IS WEALTH

BIOMEDICAL WASTE

Jeeban

Medical care is vital to our life, health and well being. But the waste generated from medical activities can be hazardous, toxic and even lethal because of their high potential for diseases transmission. The hazardous and toxic parts of waste from health care establishments comprising infectious, bio-medical and radio-active material as well as sharps (hypodermic needles, knives, scalpels etc). Biomedical waste also includes contaminated blood and cultures that can potentially cause infection. These materials constitute a grave risk, if are not properly disposed or are allowed to get mixed with other municipal waste. Its propensity to encourage growth of various pathogen and vectors and their ability to contaminate other nonhazardous/non-toxic municipal waste jeopardizes the efforts undertaken for overall municipal waste management. The rag pickers and waste workers are often worst affected, because unknowingly or unwittingly, they rummage through all kinds of poisonous material while trying to salvage items which they can sell for reuse. At the same time, this kind of illegal and unethical reuse can be extremely dangerous and even fatal. Diseases like cholera, plague, tuberculosis, hepatitis (especially HBV), AIDS (HIV), diphtheria etc. in either epidemic or even endemic form, pose grave public health risks. Unfortunately, in the absence of reliable and extensive data, it is difficult to quantify the dimension of the problem or even the extent and variety of the risk involved. Improper disposal of biomedical waste can lead to the transmission of infectious diseases and variety of the risk involved. Thus proper care should be taken by all medical personnel as well as general public in disposing biomedical wastes.

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Saving Electricity for Future

Akaankshya

How to reduce your electricity consumption?

At home

Hot water cylinder

- Instruct all household members, particularly domestic workers and children, in the economical use of hot water
- When bathing, use as little water as possible, or better still, have a shower
- Do not wash one cup at a time under the hot tap. Rather stack the dirty dishes and wash them in the sink at the same time

- Do not allow hot water taps to drip
- Have the hot water cylinder thermostat set as low as the household's hot water demand will permit
- Switch off the cylinder when not in use, for example at night, or, should the family go out to work during the day, the cylinder could be switched off in the morning. More importantly, switch off the cylinder when away for relatively long periods, such as when on holiday
- Recommended temperature setting is 55°C

Stove

- When boiling water, turn the heat down as low as possible so that the water just boils. Do not cook food with the controls set higher than absolutely necessary
- It is cheaper to heat water in a kettle than to heat it in a pot on the stove
- Do not cook food for longer than necessary
- Make sure that the bottom of the pots are flat so that good contact can be obtained between the stove plates and the bottom of the pots
- For stoves that have heavy, solid plates that retain heat, switch off the plate a few minutes before removing the pot
- Small pots should be heated on the stove's small plates to avoid unnecessary heat loss
- A microwave oven is cheaper to operate than a stove

Refrigerators and deep freezers

- Open the refrigerator or deep freeze door as little and for as short a period as possible
 - Do not place hot food in the refrigerator or deep freeze. Allow it to cool externally first
 - Ensure that door seals are in good condition
- Space heaters and air conditioners
- Sit as close as practically possible to a heater to avoid the need to have both elements switched on
 - Switch off the heater when leaving the room for any length of time
 - When using heaters or air conditioners, limit or restrict as far as possible the opening of windows
 - Curtains help to retain the heat in a room. Draw the curtains early in the evening, especially during cold weather
 - It is cheaper to use an electric blanket than to heat the bedroom with a heater

Other electrical appliances and lights

- When using a kettle, do not fill it right to the top if you only intend making one cup of tea
- Store excess hot water from the kettle in a vacuum flask for the odd cup of coffee or for washing up later
- Dishwashers and washing machines should only be used when one has a full load to wash and not just a few items
- Do not leave lights burning unnecessarily
- Survey your incandescent lights for opportunities to replace them with compact fluorescents. These new lamps can save three-quarters of the electricity used by incandescents and have a much longer operating life. The best targets are 60 - 100 W bulbs used several hours a day

Swimming pools

- Operate the filter pump for minimum periods
- During winter algae growth is restricted and the use of the filter cleaning system can be limited to once every few days

At work

- Turn off the photocopier when you leave - a photocopier left on overnight wastes enough energy to make about 1 600 copies!
- Turn off your computer monitor - a monitor left on overnight wastes enough energy to laser-print about 800 A4 pages! By turning off your monitor energy consumption can be reduced by 50%
- Leaving the lights on in an empty office overnight wastes enough energy to make about 1000 cups of coffee!
- Save 10% of an air-conditioner electricity bill by turning the thermostat down 1° in winter and up 1° in summer.

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WILDLIFE

Sandalwood

Scientific classification

Kingdom: Plantae
 Division: Magnoliophyta
 Class: Magnoliopsida
 Order: Santalales
 Family: Santalacae
 Genus: *Santalum*
 Species: *album*



Sandalwood is cultivated and traded for many years

for its oil, fragrance, medicinal qualities and even use as timber for fine woodworking. For these reasons it is extensively exploited, and its population in wild is vulnerable to extinction. It occurs in semi-arid areas from India to the South Pacific and the northern coast of Australia. It normally grows in sandy or stony red soils.

It is an evergreen tree of height 4-9 m, which may live up to a hundred year. This plant is hemi-parasitic to roots of other tree species, but without much harm to the hosts. The bark is reddish or brown to black, often becoming cracked with a red reveal. The leaves are thin, opposite and ovate in shape. Fruit is produced after three years, viable seeds after five.

Its export is banned in India and all trees, even on private land, are property of the Government.

All the science lovers are requested to submit their original articles pertaining to science to bluejayscienceclub@gmail.com