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Siwalik Rocks in Tista Valley

Tista valley in the Eastern Himalayas has Siwalik rocks that are different from those found in the Shivalik hills of the Western Himalayas. The Siwalik here was also considered a megafan deposit of fresh water alluvial soils. But there is no evidence of fossils of fresh water vertebrates.

Based on the large number of trace fossils of marine origin from the study area, and the abundant wave or combined wave and current-generated structures in the area, researchers from the Indian Statistical Institute, Kolkata and the University of Rochester now argue that the Siwalik foreland basin had a depositional environment and palaeogeography which are quite different from what we believed. Read the Research Article on **page 889** in this issue for the details of this revelation.

Silk-stocking District

...a library of properties

The earliest evidence of the lustrous fabric can be traced back to more than 5000 years ago in China, where the fabric was reserved for royalty. Due to sericulture technologies, today even the middle class wear it on occasion.

In India, Mulberry silk, produced by *Bombyx mori* moths reared in captivity and Tasar silk, produced by wild *Antheraea* species of moths, is common. The quality of silk fibres produced by different kinds of moths varies considerably from one another. Knowledge of their properties will aid in selecting the most suitable variety for other possible uses.

Silk is essentially a protein; it is extremely biocompatible and can be used as sutures, dressings or even tissue implants. The last few decades have seen a surge in non-traditional applications of silk fibres. Now, a team of scientists from Pune and South Korea have investigated the properties and behaviour of silk fibres produced by three different species of silkworms found in the hotspots of the Western Ghats and Satpura ranges in India.

How does mulberry silk differ from two kinds of Tasar silk under varying conditions of temperature, pressure, and other environmental factors? Which is the better silk for biomedical applications? Go to the Research Article on **page 919** in this issue to find out.

Bisphenol A Regulation

Comparing countries

Bisphenol A or BPA is a common chemical/compound found in polycarbonate plastic containers of commercial and domestic uses. Research in the last two decades has shown the estrogenic activity of BPA and the disruption of reproductive functions due to BPA. Yet, most countries have ignored these research findings.

Now on **page 861** in this issue, a General Article by researchers from the Bharathidasan University, Trichy argue against the resistance to research findings and delineate the slow evolution of regulations on the use of BPA in different countries.

Purification of Ganga

Diatoms have a party

Land-use change in the Gangetic plain has led to widespread pollution of the Ganga. It is known that diatoms, with their unique cell wall composition and potential to produce transparent exopolymeric particles, can help regulate carbon sequestration and remove nutrients and heavy metals from water. Researchers from Varanasi followed this lead and measured the relative abundance and diversity of diatoms to understand their links with water quality.

They took four tributaries of the Ganga–Yamuna, Assi, Varuna and Gomti for their study. They fixed limestone bricks on bamboo poles and deployed these at and after the confluence. And allowed colonization by algae over a period of two months before the monsoon. They also collected three samples of water from points before, at and after the confluence, to determine transparent exopolymeric particles and to understand their links with water chemistry and dominance transference. The study, repeated for four consecutive years, shows that despite increasing levels of pollutants and environmental disturbances, exopolymeric particle production in the river is maintained by the shifting dominance patterns of diatom species.

Leveraging on diatomic species that produce exopolymeric particles may help buffer the river against the ecological impacts of these pollutants, say the researchers. For more details, read the Research Communication on **page 959** in this issue.

Beach Bleach

Bacteria decolorize azo dyes

Azo dyes come in vivid bright hues and are used as a staple colorant in several industries. But during each colouring cycle, a huge fraction of such dyes is left unbound and disposed off in water bodies. This affects the health of aquatic plants and animals as azo compounds meddle with critical life processes. Some of these dyes are also carcinogenic.

At present, industries rely on adsorption, centrifugation and reverse osmosis to check the release of dyes in the environment. But these methods are cost intensive and often not very reliable. Scientists have now come up with an easy solution – deploy nature's own decomposers to clear the muck.

As the end scavenger, bacteria break down complex compounds to simple elements. Several soil bacteria have been explored as potential decomposers for azo dyes. Now scientists from the National Institute of Oceanography, Goa have turned their focus towards marine bacteria as a decolourizer for azo dye.

Using microscopy and chromatography, the researchers revealed how the bacteria tackle amino black and congo red, two widely used azo dyes. How did the scientists select a single bacterium from 76 distinct bacterial colonies found on a sponge for decomposing azo dyes? Read the Research Communication on **page 965** in this issue.

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