

In this issue

Critical Minerals

Extraction, recovery, use

Metal and non-metal minerals that are critical for industries, agriculture, health, security and technological applications are often scarce or unevenly distributed on the earth. So geopolitical realities make it imperative for each country to take stock of what is critical for them.

After examining the case of uranium in detail in the last few decades, R. Dhana Raju now provides an overview of the issue of all critical minerals – from the need to define what is critical for India, to the strategies for extracting, recovering and using the resources for optimum economic development.

For pointers to strategic action on the mineral wealth of India, read the General Article on **page 919** in this issue.

Pulmonary Fibrosis

Baicalein and bleomycin

Bleomycin is an anticancer drug. But it has side effects. It causes pulmonary fibrosis. In fact, bleomycin-induced lung damage is used as animal model for pulmonary fibrosis.

Researchers at the Guru Angad Dev Veterinary and Animal Sciences University induced pulmonary fibrosis in male albino mice. And tested the effectiveness of baicalein, a flavonoid found in some plants, in treating pulmonary fibrosis.

The acute lung injury caused by bleomycin releases proinflammatory cytokines and attracts polymorphonuclear cells that infiltrate alveoli. The inflammation leads to changes in alveolar epithelial cells: they differentiate into myofibroblasts. This epithelial–mesenchymal transition is concurrent with increase in fibrins in the extracellular matrix. The deposition of collagen affects the transfer of oxygen to blood and the removal of carbon dioxide from blood.

But in animals treated with baicalein, all these were controlled. For the thousands who are affected by

lung fibrosis due to various reasons every year, this may raise hope, but they will have to wait for human clinical trials before the medicine hits the market. Meanwhile, read the details in the Research Article on **page 962** in this issue.

Publishing and Presenting

Dejection due to rejection

When the young researcher's aspiration to publish in high-impact-factor journals is met with rejection without even a review, again and again, the realisation that writing skills are important slowly sinks in. This is the best time to build the capacity of Indian researchers to write and communicate well, opines Yateendra Joshi, a scientific editor.

Over the past 15 years, he has been involved in capacity building to write, publish, and present research. From conducting workshops ranging from a couple of hours to 1–2 days to a week and courses over a full semester with students/participants ranging from 8 to 10 to more than 250, he has been putting in relentless efforts. Now, in a General Article on **page 912** in this issue, he reflects on his experiences and experiments to suggest strategies for improving not only the writing skills of Indian scientists but also the credibility and visibility of Indian journals.

Food and Reproduction

Transgenerational effects

Geetanjali Mishra and Omkar at the University of Lucknow have been examining ladybirds for some decades now. Ladybirds are useful to control sucking pests in agriculture. This time, they report a curious phenomenon in the ladybird species, *Propylea dissecta*.

They fed sets of third instar larvae of the species with aphids *ad libitum*, but with different frequencies: once in four days, once in three days, once in two days, once a day and all day. The larvae with food deprivation for more than two days did not survive.

But when the others fed with different diet frequencies were turning into the fourth instar, one set received as much food as they wanted; another received food *ad libitum* for 24 hours followed by deprivation for 12 hours; and yet another group received food for 12 hours and were deprived for 12 hours.

Though the researchers lavishly fed the adult females that emerged, reproductive success was highly influenced by food availability at earlier stages of development. But what was startling was that the effect is passed on to the next generation.

Read on, in a Research Communication on **page 1038** in this issue.

Unsustainable Resource Extraction

Hollongapar Gibbon Sanctuary

Hollongapar Gibbon Sanctuary in Jorhat District, Assam has six primate species, more than 200 bird species and a wide diversity of plants. The sanctuary, barely 21 square kilometres, is surrounded by tea plantations. Narayan Sharma and team from the Cotton University, Guwahati identified 15 locations in the periphery of the sanctuary where people enter to collect non-timber produce from the forest. Between January and May 2010, the team spent more than 280 hours observing these locations and collecting data on the people and the resources they collect.

During this time, more than a hundred groups consisting of more than 400 people went in and out of the forest, carrying about 3800 kilograms of forest produce.

In a Research Communication on **page 1042** in this issue, the researchers suggest practical strategies to stem this unsustainable over-exploitation of the forest and to protect the wildlife in the sanctuary.

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