

In this issue

Agricultural Water Management *Appropriate to agro-climatic zones*

About 70% of groundwater withdrawal is for agricultural use. So we need to rationalise decisions on crops and technologies for agricultural water management appropriate to each agro-climatic zone.

Take, for example, the case of West Bengal, with six distinct agroclimatic zones: the northern hill zone, the Terai-Teesta alluvial zone, the Gangetic alluvial zone, the Vindhyan alluvial zone, the red lateritic zone, and the coastal saline zone. Though water availability is greater than demand in some parts of the state, in some districts, the demand for agricultural water is much more than the availability.

To sustain and increase agricultural productivity, there is a need to develop and manage groundwater replenishment. But the technologies to be adopted differ from zone to zone.

What crops and which water management strategy should we use for each agroclimatic zone? Researchers from the ICAR-Indian Institute of Water Management, Bhubaneswar and the West Bengal State Watershed Development Agency present a General Article in this issue to answer the question.

Turn to **page 386**.

Indian Astronomical Tables

From the time of Aryabhata in the 5th century, many schools of astronomy came up in different parts of India. Besides tackling equations for predicting the positions of the planets and the sun, they made astronomical tables and almanacs. Some even created cryptic verses that provided the positions of planetary bodies. Even today, the *panchang* is the mainstay for estimating the right time for many Hindu rituals.

An article in this issue, by two women mathematicians, reviews the

historical development and evolution of the astronomical tables in India, with special emphasis on *Makarandāsārīṅī*, the system developed by Makaranda in the 15th century. They have a special reason for doing this: to formulate algorithms and to write computer programs for obtaining results with better accuracy to enable a comparison of the *Makarandāsārīṅī* results with those of other tables, to update the parameters, to improve the procedures and to make the tables relevant to modern times.

Read the Review Article on **page 402**.

Xanthone from *Swertia chirata* *Preventing cancer*

In the January 10 issue of your favourite journal, on page 47, you can see a Research Article which reported the potential use of a derivative of xanthone, extracted from *Swertia chirata*, as a cancer therapeutic drug. The researchers had reported *in vitro* studies using colon cancer cells, to support their claim.

Now, in this issue, the team, from the Chittaranjan National Cancer Institute, follow up with *in vivo* studies.

They started administering 1,5,8-trihydroxy-3-methoxy xanthone extracted from *Swertia chirata* to Swiss mice and, after two weeks, used croton oil and 9,10-dimethylbenz[a]anthracene, two potent carcinogens, on the shaved skin of the mice (of course, after ethical clearances). Throughout the experimental period of 20 weeks, they monitored the mice: their blood, liver and kidney functions, intra cellular reactive oxygen, antioxidant activity, signs of inflammation...

In the mice that did not receive the xanthone derivative cancerous growth became visible in six weeks. In mice that received the treatment, a small number started showing pathology at 14 weeks.

So at 14 weeks, and after 20 weeks, the team examined the histopathology in skin tissues for signs of cancer, apoptosis, RNA, proteins and other indicators. And what did they find?

Turn to **page 429** to find out.

Wildlife Hunting

During COVID-19 lockdown

The lockdown in India during March–May 2020 led to widespread unemployment, the return of migrant workers to rural areas and supply-chain disruption. This, in turn, led to food insecurity. There were reports from different parts of the world about an increase in wildlife hunting during the COVID-19 lockdown. What was the case in India, where wildlife hunting is restricted? What are the reasons for the increase in wildlife hunting, besides sheer hunger? A Research Article in this issue explores the issue.

The researchers used online surveys of key informants, interviews with wildlife experts or teams in focal locations as well as media reports on the issue. An analysis of 99 responses from 74 districts across 23 Indian states showed that, while most areas had higher wildlife hunting, in a few it was reduced and, in some, it remained unchanged. Wildlife hunting went up not only for household consumption; it was also for sport and recreation. Lockdown had impacted the enforcement of the ban on wildlife hunting also.

Media reports with 78 statements by 60 experts echoed most of the findings.

What policies and systems should we put in place to avoid a recurrence of the phenomenon, which may happen not only due to pandemics, but also in times of climate extremes, recessions, civil strife or war? Read on from **page 448**.

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