In this issue

Nipah Virus

Scientometrics, n'est-ce pas?

The Nipah virus, first isolated from a patient from Nipah village in Malayasia, a little more than 20 years ago, has already taken more than 250 lives in Bangladesh and India – in six different outbreaks, separated by years. What are scientists doing to contain the emerging threat of this evolving viral pathogen?

A General Article on **page 1574** in this issue, examines the scientometrics of the literature on the subject indexed in the Scopus database. Which are the authors, institutions, countries that have contributed to more than a thousand publications in the last 20 years? What are the patterns of scientific collaborations in the area? Which are the leading journals that publish on the topic? What are the yearly trends in frequency of publications? What are the keywords that the authors use to flag, for the benefit of potential readers?

While answering such questions, interestingly, it emerges that though Asia has seen six onslaughts and many deaths due to the virus, it is Australia and the US that lead in research in the area. It is time that Asian scientists wake up and address their local issue more seriously.

Plant Disease Resistance

Targeting transcription

To improve the resistance of cultivated crops to pests and pathogens, the obvious strategy is to add resistance genes to the genome. But transgenic crops have earned a bad name in some quarters and so, to protect the crops in a sustainable manner, we need to consider other strategies.

A Review Article in this issue examines the possibility of targeting transcription factors, the regulators of the expression of disease resistance genes. Stimulating the over-expression of resistance genes and/or reducing or inhibiting the expression of genes that reduce disease resistance are fraught with difficulties since disease resistance in plants is self organised by a network of genes rather than just one or two. Use of synthetic agents that elicit defence responses in plants and increase their immunity, though successful commercially, may at times, lead to compromising growth and yield. Use of bioagents – bacteria or fungi – to stimulate both growth and immunity may perhaps be more sustainable. Another approach is to stimulate the production of phytochemicals that are involved in resistance by metabolic engineering.

While opening up a plethora of possibilities, the authors highlight the promising areas that need further research. Turn to **page 1598** now.

Revealing Shipwrecks

For centuries, the trade winds transported goods and people over the sea from South East Asia and India to the West. The ships used the winter monsoon winds for sailing back. But cyclones, tsunamis and accidents often led to many shipwrecks. More than 12,500 shipwrecks have been recorded between 1824 and 1962.

The Indian Government, in collaboration with Portugal, is now setting up a Maritime Heritage Museum at Lothal, a Harappan Civilization site in Gujarat, to identify the locations and to undertake underwater archaeological studies to reconstruct maritime history, archaeology of boat building and materials traded, and to display cultural material from shipwrecks in the Indian Ocean.

A Special Section that starts from **page 1608** in this issue, brings together a collection of papers on the subject of underwater archaeology from experts around the world to provide a baseline on the current advances in the field.

Dust Storm in Middle East

Microbes in Maharashtra

2 April 2015. A dust storm intensifies in the Middle East. By the 4th it was moving towards India. On the 7th, it reached Maharashtra. Scientists from the NCCS Pune collected air samples from Mumbai, Lonavala and Pune, cultured the microbes in the samples and identified them. The number of colonies that formed from the samples collected on the 7th was double that from the samples collected 40 days later. Out of the 32 genera of microbes identified from both days, 15 were unique to the air samples from the 7th and 11 were unique to the samples from the post dust storm day.

Read the Research Article on **page 1693** in this issue to find out how free air travel offered to microbes by dust storms impacts plants and animals including humans.

Detecting Sink Holes

Saving urban infrastructure

Rapid urbanisation requires laying cables, water pipes, sewage lines and other underground structures. The road over underground infrastructure is often seen to cave in, usually after heavy rain or because of leakage of sewage or water pipes. Water renders underground cavities unstable. In a busy urban road, this creates chaos.

There are ways to detect such underground defects that portend possible sinkholes before disaster strikes. But shallow seismic sounding is not advisable in an urban setting. And electromagnetic methods call for elaborate setups, not feasible in a busy street. Enter ground penetrating radar. And the problem is solved.

In a Research Communication on **page 1710** in this issue, scientists and researchers from NGRI, Hyderabad provide a case study of the use of portable equipment that sends out electromagnetic signals ranging from 10 MHz to 2.4 GHz, and detects the reflected waves to enable the reconstruction of 3D images of the soil rock and structures underground. Prompted by the sudden formation of a sinkhole near the Clock Tower in Secunderabad, the team undertook the task of locating potential areas of road subsidence, from the Clock Tower to Patny Centre, using the non-destructive technique.

One day, perhaps, the technology will be part of the toolkit for civil engineers responsible for urban infrastructure.

K. P. Madhu
Science Writing Consultant
scienceandmediaworkshops@gmail.com