In this issue

IT to protect traditional knowledge

Intellectual Property regime protects the rights of individuals and corporations who invest their time, effort and money in innovations. They have the right to economically benefit from their inventions and creations. But the regime also allows greed to breed leading to attempts at patenting even neem and turmeric.

People in different parts of the world have responded to this tendency by taking up the challenge of protecting people's property rights. Traditional knowledge is documented in detail, curated, and searchable databases are created, so that those who are tempted to claim that traditional knowledge is their individual or corporate property, can be adequately tempered with evidence that proves otherwise.

In this issue, researchers from Chennai examine such initiatives in India, China, Korea, Venezuela, South Africa and Australia (**page 1240**). The brief introductions to the documentation initiatives in different parts of the world will serve as starting points for reflections – on the processes followed, on issues related to access to the databases and on networking the initiatives to allow information flow between such initiatives.

The general article focuses primarily on the traditional medical knowledge. However, the questions that arise from it can be posed to other areas of traditional knowledge as well: How should such databases on traditional knowledge be funded? Since traditional knowledge is people's knowledge, is crowd sourcing the best method to create a database? Should access to databases on traditional knowledge be limited to those who created it and/or to those who are rich enough to subscribe to them?

Wet labs and virtual labs

Plants, unlike animals, cannot escape from environments that are stressful to them. So evolution of mechanisms to tolerate different environmental stressors has been more elaborate in plants. The anatomical response of various plant species, especially those that are of important in agriculture, to heat, drought, salinity, etc., have been studied for quite some time. But it is only from 1950s, when the studies became more detailed and reached the biochemical level of proteins expressed in response to the stressors, that the phrase 'abiotic stress' becomes popular in scholarly literature. The experimental approaches became even more diversified in the last two decades with the development of biotechnological tools and techniques of inquiry. So, no wonder then, that in the recent years, the explosion of experimental information in this area of scientific investigation has been quite remarkable.

When data production outruns the human ability to grasp the essentials, information technology comes to help. Scientists, from Centre for Agricultural Bioinformatics, examined the proteins that are expressed in Poaceae family – which includes cereal crops like rice, wheat, barley, millet and corn – in response to the abiotic stressors. Using stepwise regression methods, they looked for the important physicochemical features of these proteins and classified them. Then these classifiers were used for predicting the stressors to test their levels of accuracy and sensitivity. They report the success of their efforts in this issue (**page 1283**).

The wet labs now can leverage on these findings from these *in silico* bioinformatics studies and explore the functions of the specific protein sequences that are highlighted by the study and their roles in tolerance to the abiotic stressors. Understanding of the key proteins sequences will help us to fortify agricultural crops with genes useful for stress tolerance. The historical interplay between the results from the wet and virtual labs to seek food security for the welling populations continues…

Monitoring monsoon

Rain gauges have been used for centuries to measure rainfall. Fairly reliable datasets for the Indian subcontinent from late 19th century are available. The coverage of continent with rain gauges has increased from early 1970s improving the resolution and the datasets have become more accurate and reliable. But human errors still creep into the data. Moreover, the data so collected is of no use for predicting the vagaries of monsoon over the subcontinent.

It is only when satellites which can see from above that we could hope for broad coverage of the land area. Kalpana-1, our first meteorological satellite, launched in 2002 had detectors for light in the visible range as well as for the infrared to detect thermal emissions, and also for the wavelengths appropriate for detecting water vapour. The data has kept flowing much past the estimated life of the satellite.

But then, we cannot measure rain from that view point from space. The data on the various spectra have to be triangulated with the actual rainfall datasets from the ground for standardizing the interpretations. And of course, there are other satellite-based sources that provide similar data using other techniques and they have to be matched.

Scientists from Atmospheric and Oceanic Sciences Group of ISRO and National Centre for Medium Range Weather Forecasting in this issue summarize the advances in this field with a Research Article (**page 1275**). They describe a large scale estimation of rainfall in areas covering 1 degree latitude and 1 degree longitude using a precipitation index and a smaller scale estimation of 0.25 degrees grid boxes of longitude and latitude using a multispectral algorithm that are proved to be useful. Though these estimates are in fairly good agreement with the datasets from ground-based rain gauges and the data from other satellites, the authors point out need for further refinement of the methods.

The moisture calculations from satellite readings need to be corrected since they are underestimated in moist condition and overestimated in dry and semi-arid areas like Rajasthan. This leads to errors in rainfall estimates. Moreover, the influence of mountains – the Ghats, Himalayas – also needs to be factored into the calculations. It appears that monitoring the monsoon by milking the data from a satellite that has outlived its estimated time, may yet lead us to further opportunities for scientific breakthroughs.

K. P. Madhu
kp.madhu2000@gmail.com