communication system and outstation patrol camps have been developed, which have helped to control poaching considerably. Fire protection engineering is carried out by suitable preventive and control measures. Also, livestock grazing has been controlled to a great extent in the tiger reserves. To increase the animal density, various compensatory developmental works were undertaken that have improved the water regime, and the ground and field-level vegetation.

The All-India Tiger Estimation Report presents India's current tiger population and a broader assessment of tiger landscapes. This estimation was carried out between December 2009 and December 2010 in three phases. In phase I, field data were collected at the beat-level, i.e. the primary patrolling unit by trained personnel using a standardized protocol. Analysis of habitat status of tiger forests using satellite data was done in phase II and in phase III, camera trapping was the primary method used, where individual tigers were identified from photographs based on their unique stripe patterns. This information was analysed using a well-established scientific framework. Camera trapping was carried out by teams of wildlife biologists and local forest personnel. Based on the tiger numbers recorded in sampled sites, an estimate for other contiguous tiger-occupied landscapes was made.

About 476,000 forest personnel were involved in data collection who sampled 29,772 forest beats and walked approximately 625,000 km in phase I. Approximately 800 cameras were used to trap 10,500 sq. km forest areas. This entire estimation costed Rs 9.1 crores.

Compared to the last tiger estimation carried out in 2006, the 2010 tiger assessment has several innovations such as partnerships with civil society organizations such as the Wildlife Trust of India and Aaranyakand World Wildlife Fund for Nature-India. Additional technical expertise was provided by the Centre for Cellular and Molecular Biology (CCMB), Hyderabad. Local communities were involved in data collection and analysis. Genetic analysis was done to estimate tiger populations from faecal samples. Along with tigers, co-predators prey and habitat quality were also assessed. Pioneering attempt to estimate tiger populations in Sunderbans Tiger Reserve, West Bengal using satellite telemetry and sign surveys was made and the first estimation of tiger population in the Sahyadri Tiger Reserve, Maharashtra was carried out in this assessment.

The 2010 national tiger assessment has shown two important findings. First, most tiger source sites continue to maintain viable tiger populations. Second, there is evidence of new forest areas populated by tigers, like the Kuno-Palpur Wildlife Sanctuary and Shivpuri National Park, Madhya Pradesh. The total number of tigers estimated for 2010 is 1706, which is comparatively better than the presence of 1411 tigers in 2006 (ref. 3).

1. Project Tiger Reserves, Project Tiger, National Tiger Conservation Authority, Ministry of Environment and Forests, Government of India.
2. Tiger Conservation Authority Set Up, Press release, National Tiger Conservation Authority, Ministry of Environment and Forests, Government of India, 19 December 2005.
3. India-Tiger Estimate 2011, Ministry of Environment and Forests, Government of India, March 2011.

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IN CONVERSATION

Chemistry at the helm

Goverdhan Mehta is an organic chemist presently at the School of Chemistry in the University of Hyderabad. He is a Fellow of the Royal Society of London. He has served as the Vice-Chancellor of the University of Hyderabad and as the Director of the Indian Institute of Science, Bangalore. Son of an agricultural scientist, Mehta's interest in chemistry was kindled at the age of six, when he saw his father's co-workers carry out titrations and the colours in the flasks disappear. He admits that he faced plenty of failures and disappointments in his research career, particularly during the projects dealing with synthesis of complex molecules. But eventually when he succeeded, it acted as elixir to keep him going. Mehta says that such cycles of success and failure continue to enrich his life. *Current Science* interviewed him about the development of organic chemistry in its endeavour to celebrate the International Year of Chemistry (IYC), 2011.

Courtesy: Shamseer Mambra

Goverdhan Mehta.

How has the branch of organic chemistry evolved over the years?

Organic chemistry can be regarded as a science moving towards attaining maturity as it has evolved to deliver on many fronts, which relate to human well-being and quality of life with reasonable level of predictability. Yet, it has promises to keep in advancing new knowledge that interfaces many emerging interdisciplinary areas like chemical biology and green, sustainable chemistry.

What areas of organic chemistry have interested you?

My research interests in organic chemistry have been exceptionally diverse and encompass organic synthesis, natural products, stereoelectronic effects, and supramolecular architecture in solid state, among others. More recently, I have got interested and engaged in medicinal chemistry and synthesis in the context of drug discovery and related issues in chemical biology. As the pharma industry has slipped into a sort of innovation-deficient regime, with drying new chemical entity (NCE) pipelines, I foresee great opportunities for organic chemists in academia and industry in India.

Over the years, our research in natural products synthesis has been rather well-received. Total syntheses of over 50 natural products that exhibit wide-ranging biological activities have been accomplished by my talented and dedicated co-workers. A distinctive feature of these efforts has been conceptual simplicity and general applicability of the synthetic methodologies. For example, our synthesis of the triquinane system stands out as a seminal example of 'green synthesis'. Similarly, our advocacy of the concept of 'complex targets to global solutions', focusing on 'simple and workable' solutions to complex synthesis problems has been effectively demonstrated though our synthesis of several bioactive epoxyquinone and complex phloroglucinol natural products. Hopefully, this strategic option will be the way forward in future developments in natural products synthesis. We have attempted to blend art and aesthetics with synthetic challenges in creating molecular equivalents of several fascinating geometrical objects as new materials. Our synthesis of hetero-bowls, ladderanes and early efforts towards a classical synthesis of C60 has drawn considerable attention.

What do you see as things that have changed in the field of organic chemistry?

Given the centrality and strong connect between organic chemistry and life sciences, there are new emerging opportunities at the interfaces in interrogating cellular mechanisms, chemical genomics, synthetic biology, etc. Similarly, materials like OLEDs and MOFs are witnessing new and widespread applications and provide fertile platform for innovations. Quest for green processing has led to the development of ideas of 'dial-a-molecule', and talk of 100% efficient reactions is on the horizon. There is little doubt that organic chemistry will be at the vanguard of transition to 'green chemistry'.

What do you think lies in the future for organic chemistry?

Given the powerful connect of organic chemistry, particularly of organic synthesis with human health and well-being, sustainable agriculture and the need for accessing 'green' lifestyle materials of everyday use, this branch of science is destined to flourish and contribute through a continuum of incremental innovations.

How does organic chemistry stand relative to other areas like inorganic and physical chemistry?

Although I do not like to take a segmented view of chemical sciences, but if you like to compare the relative opportunities of various streams, then organic chemistry is the most widely pursued branch, in terms of the number of researchers and publications, career opportunities and interface with industry.

What kind of prospects do young organic chemists have?

In the context of our country, there is a great demand for trained organic chemists in various sectors of our economy, particularly in the pharma sector. Over the years organic chemists have had their fair share of Nobel prizes. Last year's Nobel Prize was awarded for cross-coupling reactions, which is part of hard-core organic synthesis. A career in organic chemistry offers best prospects among all branches of science in terms of employment and opportunities. India can emerge as a global human resource supplier for the pharma and related industries.

What significance does the IYC hold for you? What would you like to see changing this year about research in chemistry?

IYC is a great opportunity to communicate the importance and relevance of chemistry. For some reason, chemistry has lost some of its sheen in recent years and its public esteem is not at all commensurate with its contributions and its importance in addressing the future needs of human kind. Chemistry is not a 'big bang' branch of science. It is highly utilitarian and progresses in small steps through incremental innovations and is a major contributor towards the enhancement of quality of life.

It needs to be emphasized that in the quest for sustainability for our planet, chemistry will have a pivotal role in addressing issues of climate change and energy, nutrition and sustainable agriculture and human health.

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