In this issue

Diversity in sub-tropics

High species diversity in tropical areas has aroused much interest among scientists. It is also a matter of concern for the environmentalists to conserve these areas for future well-being of humans. Therefore, mega-diversity hotspots were identified over the tropics and specific efforts are being made towards conserving these hotspots. The efforts were initiated to arrest biodiversity loss, enhance regeneration of the species and enhance the livelihood potential in these areas. The premise of such an effort is that the loss of biodiversity is primarily due to high dependence of forests by the local people and the efforts towards decreased dependence would automatically enhance the biodiversity. There are two mega-diversity hotspots in India, the Western Ghats and the Eastern Himalayas.

Forests of Eastern Himalayas are considered to be rich in medicinal plants since the early civilizations of India. Probably the first codified medical system 'Ayurveda', was derived using plants from these parts. Recent importance on local health traditions such as Ayurveda, Unani and folk systems and medicines of herbal origin (particularly plants grown in natural habitats or through organic farming) has enhanced collection of medicinal plants from the wild, without encouraging the plants to regenerate in the wild. This harvesting strategy associated with extraction of forest products of subsistence and commercial importance has rendered the forest devoid of any diversity. In fact, the article in this issue (**page 776**) by Uma Shankar indicates that these sub-tropics were once as diverse as their tropical counterparts. Forests of Himalayan foothills are characterized by sal (*Shorea robusta*)-dominant forests with lower diversity. These forests are highly regenerative through root coppice of sal; thereby, the people depended on these forests for various uses such as datoon (brush sticks), timber, poles, sal leaves and yet maintained a reasonable forest cover. Datoon trade, primarily a cottage industry, itself runs to crores of rupees of business, if estimated properly in these regions.

The current report is different from other reports of the same region in two aspects; first, that species diversity in the Himalayan 'terai' regions are as high as any other lowland tropical forests in India and second, the forests of these regions are not really sal-dominated (containing only 7.5 trees per ha). Darjeeling Hills, Mahananda Wildlife Sanctuary, is theoretically not in the tropics and yet the diversity exhibited by these forests is astounding; 87 species encountered in just 2 hectares of sampling effort. Thus Darjeeling Hills has maintained high diversity, despite its anthropic pressures, particularly land conversion to agriculture (especially for tea gardens). Probably the Darjeeling tea tastes better because of the mosaic of landscapes the hills exhibit and the diversity of species in the area. The authors argue that having documented that these forests are highly diverse and have high regenerative capacity, the next step is to look into the methods by which the forests could be conserved, without affecting the subsistence needs of the people. It is not very difficult to imagine that such efforts would be successful, as we have seen in the same state, in west Midnapore district, the people's initiatives are a success story. Even better are the stories from Orissa wherein the community has led a campaign for conservation of forests in their village common land. Thus efforts for conserving these forests through people's initiatives should be mooted. Such efforts, by individual states alone, may have lot of difficulties, as seen in the past. Let us hope that such reports enhance the scope of our efforts to conserve the species diversity in Darjeeling.

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Activity of topoisomerase II

The basic disciplines of chemistry, i.e. inorganic, organic and physical have a prefix added to them 'bio' since a few decades, mainly to classify an area which encompasses all the chemical reactions and mechanisms in the biological system. At times the difference between them and classical biochemistry is too thin; spectral characteristics of Fe in haemoglobin could be bioinorganic chemistry, whereas the redox reaction of the same Fe within the protein and its beautiful manifestation in all the properties of this important molecule is a part of any biochemistry textbook. In the same token, bioinorganic chemistry has developed in order to define an area where mostly the chemistry of metal ions are studied and the ligands are mostly large macromolecules. Several standard books (*Inorganic Biochemistry*, edited by Gunther Eichhorn) and series like *Metal Ions in Biological Systems* (edited by Helmut Sigel) have emerged and prospered. Now there is even a *Journal of Inorganic Biochemistry*.

Perhaps, the greatest contribution in this area is the discovery of a potent anticancer drug like Cisplatin, which utilizes the elegant chemistry of square planar Pt(II) in order to intercalate the DNA of cancer cells and inhibit their growth. The use of metal complexes to inhibit specific enzymatic activity is also an important concept, as careful selection of target and the metal can yield useful results. In fact, the whole periodic table can be subdivided into various biological functions like mobility of ions or conductance (alkali and alkaline earth metals), redox reactions (transitional metals) or acid–base catalysis (Zn, Cd, etc.). (Readers who are interested can go through the 'Krebs Lecture' delivered by R. J. P. Williams on this topic.)

On **page 787** of this issue, the authors have selected a target molecule, topoisomerase II, which is a nuclear enzyme and crucial for resolving DNA knots that are produced during various enzymatic processes. There could be various kinds of knots produced in order to compact the DNA in a minimum volume. As cancer cells show high expression of topoisomerase II, this enzyme becomes a natural target for drugs. The authors tried to see whether Cu(II) complexes can be used to inhibit the topoisomerase II activity. The rationale behind such approaches is the selective permeability of copper through cancer cell membranes. The reactivity of Cu(II) – a d^9 system is also an added advantage.

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