In this issue

Hydrogen peroxide in biological fluids

Hydrogen peroxide is supposedly a good indicator of oxidative stress *in vivo*. Detection of hydrogen peroxide in urine serves as a diagnosis of presence of excessive reactive oxygen species *in vivo*. During normal immunological function, hydrogen peroxide is also predominantly present in activated macrophages that contain phagocytosed parasites. Banerjee *et al.* (**page 1193**) report an improved method for spectrophotometric assay for hydrogen peroxide in biological fluids. The assay is similar to the catalase tests used as a biochemical diagnostic for microorganisms. The existing method for estimation of H_2O_2 utilizes oxidation of ferrous ion to ferric ion that is detected by the formation of a characteristic coloured complex in presence of xylenol orange. The suggested modification utilizes the conversion of H_2O_2 to water in presence of the enzyme catalase. The modified method reported appears to be more specific for H_2O_2, in comparison with other reactive oxygen species, though a complete spectral analysis of cross-reactivity and interference is the subject of further investigation. The test will be useful for detection of hydrogen peroxide in biological fluids, specially in urine.

India in South Asia

With Indians trying to contribute in the arena of international science, it is becoming increasingly important that India provides a leadership role in S&T collaboration with other member states in the SAARC, in addition to negotiating terms of transfer of technology from North America, Europe and Japan. Gupta *et al.* (**page 1201**) critically look at the various parameters that measure and affect bilateral economic and scientific development. 'India has taken several initiatives' write the authors, 'to strengthen bilateral economic cooperation with some of the South Asian countries'. They cite direct investments in several countries, to the tune of hundreds of millions of US dollars, as an act of active participation in the regional scientific development. The currently available options for joint efforts in manpower training include exchange of scholars and students under the purview of the Colombo Plan, in addition to the special concessions given to the nationals from Bangladesh and Nepal.

This study analyses a number of collaborative projects among investigators and institutions in various South Asian countries. Entries available through the science citation index (*SCI*) were analysed for the content, the co-authorship and the impact factor. The list showed India topping the list by publishing 11,429 papers per year during 1992–1999. Out of the joint co-authored papers, 178 in number, clinical medicine had the longest share and mathematics the least during 1992–1999. Among the Indian hosts, Indian Institute of Technology, Kharagpur topped the list in collaborative projects by publishing 15 co-authored papers with collaborators in Bangladesh. This paper permits an assessment of the nature of Indian collaboration in science and technology in comparison to other regional alliances like the European Union, Latin American States, or the African nations. The study is inherently limited to papers published in English.

Eastern Himalayan vegetation

West Siang district, bordering Tibet, is part of the Indian northeastern state, Arunachal Pradesh. The region belongs to the Eastern Himalayan biogeography covering an area of 12,006 km^2 with an altitude up to 5500 m. The climate is continental, with a minimum temperature of 25°C below freezing at the higher altitudes and an average rainfall of 3000 mm. The region is rich with tropical, suptropical, sub-alpine and alpine vegetation including trees, shrubs, and several exotic species. Singh *et al.* (**page 1221**) report the types of vegetation in the region. Data collection involved unsupervised classification, supervised classification and field experience of human beings. During classification, difference in spectral value is used as an indicator of different vegetation.

Detailed analysis identified 23 major land cover types including seven non-forest classes containing agriculture, snow, shadow and cloud. The eight natural forest types include tropical evergreen forest, alpine and sub-alpine conifer forest. Among the few peculiarities of this zone, included is 'jhume' cultivation, as a form of shifting cultivation, Rhododendron forest patches and 'tall clumped bamboo' forest zones. Non-forest cover occupies less than 17% of the total land area. Tropical evergreen, suptropical evergreens and temperate broad-leaved forests respectively occupy approximately 16%, 24% and 30% of the total land area.

Stress factors in mangroves

At least 80 species of mangrove plants are known on this planet. These plants have adapted to intertidal zones and salinity, accommodating the regular fluctuations in water highs and salt contents. They show characteristic pneumatophores, silt roots and vivipary. Kathiresan (**page 1246**) describes the results of an experiment identifying stress factors and their alleviation in a study that lasted several years. The field study focused on a mangrove area named Pichavaram, that covers an area of about 1100 ha of which 50% is covered by forest, and is located between the Vellar and Coleroon estuaries. The estuaries are near the mouth of the Coleroon river, a distributary of the river Cauvery, and opens into the Bay of Bengal. The tidal variations experienced an amplitude of about 15–100 depending on the season, the depth of waterways ranging between 0.3 and 3 m. The region was utilized to observe variations on salt and many other physicochemical factors at the luxuriant and degrading sites in the mangroves with a view to arrive at conclusions on the causative agents for the differences, so that remedial measures could be designed. Several of the standard laboratory measurements performed on the soil samples from many luxuriant and degrading sites point to the differences in the abiotic components in the luxuriant sites, that are rich in biodiversity of flora and fauna, and the degrading sites that are not so rich. Floral and faunal species are reduced in the degrading site by about 68% and 72% respectively. Total organic carbon and other solutes are significantly lower at these sites, and the heterotrophic bacterial counts are lower by 78.3%. However soil temperature at this site is higher since light intensity at degrading sites is higher. They also appear more sandy. Soil salinity appears higher by about 64% in the degrading sites. These variations are consistent with the preliminary hypothesis that luxuriant mangroves are richer in biodiversity due to the absence of adverse abiotic conditions. The author attempts to alleviate the difference caused by natural causes by flushing of hypersaline soil with tidal water and flushing of hypersaline soil with rain water. Over a period of three years after digging the creeks to flush hypersaline soil with tidal water an appreciable reduction in soil salinity, and a moderate increase in colonization with *Avicennia marina* is observed. Soil analysis showed a significant reduction in salinity after 2 months of storage of rain water, with a significant and concomitant increase of heterotrophic bacterial population. This study raises the possibility of converting degrading sites to luxuriant sites through man-made efforts.

Radiogenic sediments in the Ganga

The Ganga river flowing for ages through miles of the Indian mainland, deposits an estimated 1600 million tonnes of sediment in the Bay of Bengal. Weathering of the extremely radiogenic black shales in the lesser Himalayan region generate osmium and rhenium that are carried to the sea water with the sediments deposited by the river. After mixing with the sea water, distribution of Os in seawater is quite homogeneous, Os being primarily associated with the organic matter in the sedimentary deposit. The average residence time of Os in sea water is estimated as 10^4–10^5 years.

To ascertain the quantity of radiogenic Os/Re present in the river sediments, portions of 5–10 l of water from the Ganga river were collected from five different locations on the river. The suspended solid material was analysed by Chakrapani *et al.* in a mass spectrometer for the presence of rhenium and osmium (**page 1253**). The range of osmium and rhenium varied between 20–65 ng/g and 500–1100 ng/g respectively. The Re/Os ratios range between 12 and 25.

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