In this issue

Adaptive mechanisms of Antarctic plants

S. M. Singh *et al.* (**page 334**) highlight the adaptive mechanisms of Antarctic plants in extreme environment. They present geographical features of Antarctica, current status of the Antarctic biodiversity, effects of UV-B radiation on plants of Antarctica, signalling of low temperature and cold adaptation in cyanobacteria, freezing adaptation in Antarctic lichens, and human invasion – a threat to Antarctic biodiversity. The map of Antarctica shows the location of Schirmacher Oasis where the Indian research base 'Maitri' is located. The map also shows the geological features, distribution of plants and GSI Borehole where India has made landmark in 'ice coring program' in Antarctica. The photographs of dominant representative of Antarctic plants will be helpful for students in the field of biology as well as the naturalist interested to know the terrestrial wealth of Antarctica.

Antarctica is the only continent in the world to have a macroflora that is dominated by lower plant groups, predominantly mosses and lichens, with few liverwort species and two species of flowering plants. Lichens are one of the dominant organisms of an ecosystem that covers about 8% of the earth's surface. Being major autotrophs, lichens form a significant part of the Antarctic biodiversity and are able to colonize terrestrial areas of Antarctica. There is also a significant microbial flora including photosynthetic prokaryotes, unicellular algae and microfungi. There is need to determine whether life originated in hot or cold environments, or if evolution took place in parallel within both environmental types.

Despite the extreme of temperature, salinity, UV light, long period of darkness, plants exist in Antarctica only because of its novel biochemical adaptations. These adaptations may provide useful compounds such as cold-tolerant enzymes and antimicrobial compounds for the prospect of biotechnology in Antarctica. Climate change is beginning to cause large-scale changes in Antarctic areas. Due to increase in summer temperature and glacial retreat in particular, fresh area is exposed for colonization and succession of new community in the areas. Thus Antarctica has become a global hotspot for understanding the impact of climate change and for discovery of new molecules for solving the problems related to human health.

DNA-based identification of victims

The procedure that is at present followed in the country for identification of individuals killed in a disaster is one in which relatives identify the mortal remains by reliance on the morphologic features of, and personal effects on, the victims. In developed countries, identification of these victims has most often been based on their dental records. Since such records are not available for most individuals in developing countries, it has been suggested that DNA profiling of the victims and their comparison with the DNA profiles of claimant relatives would be an effective biometric identification tool, especially where the victim remains have been charred or decomposed.

In this issue, Nandineni *et al.* (**page 341**), from the Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad describe their experience on the DNA-based identification of deceased passengers and crew of the Air India Express aircraft which crashed in Mangalore on 22 May 2010. After the accident, local authorities handed over the remains of 136 victims who were identified by the claimant relatives, but 22 bodies remained unidentified or were subjects of competing claims from more than one family. CDFD personnel generated the DNA profiles of the 22 bodies and were able to identify 10 of them within 48 h, whereas the other 12 victim remains were conclusively shown not to be from the biological relatives of any of the claimants. The data indicate that in this disaster, several of the original identifications of the victims (prior to DNA testing of the remainder) had been erroneous. The policy implications of this exercise are discussed with regard to the formulation of disaster management plans in the country.

Ultramafic rocks in Madawara igneous complex

The ultramafic rocks in Madawara igneous complex (MIC) in southern part of Bundelkhand Massif has gained significance due to recent reports suggesting relatively high levels of platinum group elements (PGEs: Ru, Rh, Pd, Os, Ir and Pt). The PGEs are economically important group of elements (siderophile and chalcophile in character) and there is a huge demand for them in manufacturing sector industries. Although potential for PGEs are clearly seen in rock types such as those in Madawara ultramafics, detailed exploration studies have not been carried out till date due to obvious reasons. An attempt has been made (**page 375**) to study the Madawara ultramafics with a view to develop a conceptual model by which PGE mineralization has taken place. MIC is about 40 km in length and 2–4 km wide, mostly dominated by mafic–ultramafic suites containing olivine-bearing websterite, harzburgite, gabbro and orthopyroxenite. Petrographic studies shows presence of cumulates of olivine in dunite/pyroxenites and the platinum group of minerals are suspected to be present in disseminated form within the interspaces of olivine cumulates. Analytical data indicates relatively high values of ΣPGE (~ 700 ppb) especially IPGE and Pt (> 100 ppb), suggesting that this complex could be a potential PGE prospect. Three major processes for the origin of PGE fractionation have been discussed, viz. partial melt, crystal/liquid sulphide fractionation and alteration. The mineralization is somewhat unclear at this stage of study, especially because of mylonitization at both ends of the ultramafics, but the evidence gathered so far suggests a complex model involving multiphase magmatism and sulphidation responsible for mineralization.