

## In this issue

### In pursuit of sustainable agriculture. . .

For feeding a population of 1.4 billions by 2025, India will need to produce 301 MT food grains. To reach this level of crop production, the country will need at least 45 MT of plant nutrients which will largely be the chemical fertilizer. However, to maintain the soil health and food production, integrated approach using compost, manure and other non-hazardous innovative alternatives, is called for to supplement the chemical fertilizers.

Introduction of specific bacteria and fungi into soils has been performed in agricultural practice for decades. The main purpose of these releases is (i) to supply nutrients to crops, (ii) to stimulate plant growth, e.g. through production of hormones, (iii) to improve soil structure, and (iv) to control or inhibit the activity of plant pathogens.

Inoculation of plant roots with beneficial rhizosphere microorganisms should confine its location to the root vicinity and also retain their numbers and viability to realize its beneficial effect at the precise time needed by the plants. The common methods of microbial application are as liquid broth, dried bacterial cultures on seeds, and by use of various organic carriers, whose function and survival in natural environment has always been an issue. Studies to develop new technology to maximize the efficacy of microbial inoculants in the soil and scaling it for commercial application is challenge poised to the agriculture scientists today. See **page 1595**.

### DRD2: A promising marker for association studies

Association studies have attempted to identify possible candidate genes that may help to understand the population-specific ailing. The dopa-

mine receptors are involved in motor control, neuroendocrine regulation, cognition and emotion, and are crucial targets in the pharmacological therapy of schizophrenia, Parkinson's disease, Tourette's syndrome, tardive dyskinesia, Huntington's diseases. It also influences individuals' behavioural approach system, motor fluctuations in PD, ethanol metabolism and hence most of the studies have performed as association studies. Almost all the studies have used only the *Taq1* 'A' site, a single nucleotide polymorphism (SNP) in a *Taq1* restriction site. The use of haplotypes of multiple genetic markers distributed through and around the gene is thus a powerful tool for resolving the controversial issues of such association studies based on individual polymorphisms. Haplotypes provide information on evolutionary histories, beyond what can be learned from individual markers. Scoring these markers as haplotypes allows analysis, both in terms of haplotype frequencies and identity and also in terms of linkage disequilibrium.

A possible role of the dopamine D2 receptor (*DRD2*) locus has been reported, in recent years by various fields like the etiology of alcoholism, neuropsychiatric disorders, etc. and therefore it has been the focus of considerable attention. DNA analysis has made it easier to study haplotypes, arrays of alleles at closely linked loci along the chromosome. These regions are short enough to show little or no recombination, and behave as blocks that might have ancient origins. Scoring these markers as haplotypes, allows analysis both in terms of haplotype frequencies and identity in terms of linkage disequilibrium (LD). The human dopaminergic system is also a promising nuclear DNA marker in studies of human genome diversity. Haplotype frequencies and LD for *DRD2* in four tribal populations of Eastern Ghats, shows its high profile of polymor-

phism and the haplotype system showed high level of heterozygosities. Out of the possible eight haplotypes, all the populations commonly share seven. The ancestral allele B2D2A1 was present in all the groups consistently. The LD was statistically significant in all the populations. The results show a chance of Indian origin or back migration of human *DRD2* haplotypes. See **page 1589**.

### Magma underplating and crust building processes beneath Kutch

Magmatic underplating is a quantitatively important mechanism of crustal growth and evolution in continental flood basaltic provinces (CFBs). The likely areas beneath continent, to trap basaltic magmas are located near the Moho or within the crust. The ubiquitous occurrence of cumulate xenoliths in the lavas is perhaps the best and most direct petrological evidence for the significance of magma intrusion and accumulation beneath continental areas. Occurrence of ultramafic xenoliths of both mantle and cumulate in origin help in constraining the composition and evolution of the subcontinental lithospheric mantle (SCLM) and the magmatic processes responsible for the crust building process. Karmalkar *et al.* (**page 1582**) review occurrence of suite of ultramafic xenoliths entrained in the alkaline lavas, especially the cumulate xenoliths from Mt. Sayala from the Kutch region of Gujarat state Western part of Deccan Flood Basaltic Province, India and discuss their implication in understanding sub-crustal level magmatic, and crust building processes. A close genetic relationship of magmatism and tectonism in Kutch has been inferred and it is envisaged that the magma chambers beneath Kutch occur as plexus of interconnected dikes and magma pockets from which magma was periodically expelled.