

## In this issue

### Mapping vegetation dynamics in Barak basin

The terrestrial, hydrological and the atmospheric components of an ecosystem lie in close and intricate linkages with each other. The perturbation in one of its component will disturb the balance of the ecosystem. The changes occurring in the terrestrial ecosystem due to changes in the vegetation cover may disturb the delicate balance existing within the ecosystems leading to severe natural catastrophes. The worst results that may affect human lives can be due to changing weather phenomenon, non-uniform rainfall distribution, causing recurring floods, droughts, etc. Kasuri (page 1236) made an attempt to study the vegetation dynamics considering Barak Basin as a single ecosystem unit. The Barak Basin covers the North East Indian states of Assam, Manipur, Mizoram, Nagaland and Tripura and possesses rich and diversified vegetation. Use of remote sensing data of MODIS helped to study the vegetation changes over larger area and the IRS LISS III and LISS IV data helped to assess the reasons for such changes in selected pocket of study area. It is found that several pockets in this region is facing high disturbance causing forest degradation. The shifting cultivation or 'jhum' is a dominant form of agricultural practice, which is causing major damage to the existing forest cover in the region. The importance of the study lies in the fact that since the basin covers few of the north-eastern states and slight disturbance in one of the areas may lead to severe consequences in the adjoining areas which will have an effect on the ecosystem linkages and alter its structure and function. The basin as a result of such disturbances and loss of forest cover may result into a totally changed unit of biological composition by losing its valuable species

of flora and fauna and may face severe natural calamity in future.

### Genetic variations and clustering in *Murraya paniculata* complex

*Murraya paniculata* commonly known as 'orange jasmine', belonging to the family Rutaceae, is a handsome garden plant. Almost all parts of the plant are medicinal. The plant yields a glucoside, 'Murrayin', which heals bruises and eruptions upon treatment. Leaves are medicinal and used in the treatment of diarrhoea and dysentery. Flowers are fragrant and used in cosmetics. The juice of the root is used as a pain reliever for kidney-associated problems. *M. paniculata* is a widespread species with many different forms varying in their growth habit, size and shape of leaflets, number and size of flowers, and fruits.

There has been a long existing taxonomic complexity on the correct status of *M. paniculata* and *M. exotica*, the two forms occurring in the wild and cultivation in India. The correct taxonomic disposition of any taxa is of fundamental importance in the diversity studies. Molecular methods provide valuable data on the diversity through the ability to detect variation at the DNA level. Sushma Verma *et al.* (page 1210) carried out detailed genetic diversity studies on the wild and cultivated genotypes of *M. paniculata/exotica* by single primer amplification reaction (SPAR) methods, viz. RAPD, DAMD, ISSR.

The data generated for all three SPAR methods was used to compute pair-wise distances, using Jaccard's similarity coefficient, and the UPGMA tree generated. The clustering pattern of the *M. paniculata/exotica* genotypes into two distinct (wild and cultivated) clusters and the genetic diversity amongst the two forms clearly indicates their taxonomic identity to be distinct, and is in congruent with the morphological findings.

### Indo-Gangetic Alluvial Plains

The Indo-Gangetic Alluvial Plains (IGP) are among the most extensive fluvial plains of the world and cover several states of northern, central and eastern parts of India. Although it is difficult to determine the characteristic soil minerals of different climatic zones, clay mineral assemblages of soil chrono-association of the northern and central IGP, indicate that pedogenic smectite-kaolin (Sm/K) can be considered as a potential indicator for palaeoclimatic changes, viz. arid to humid climates during the Holocene. The climatic episodes reported so far is reflected in the alteration of primary and secondary soil minerals and also in the soil fabrics. Biotite weathered to trioctahedral vermiculite and smectite in the soils during arid conditions, and smectite was unstable and transformed to Sm/K during the warm and humid phase.

It is generally observed that the cereal-based systems contribute to higher accumulation and stabilization of organic matter especially in rice-wheat systems because decomposition of organic matter in the absence of oxygen is slow, incomplete and inefficient. The study indicates contributions of both earth and soil scientists to develop the state-of-art information on the IGP, the soils and its historical development including tectonic, climatic and geomorphic episodes and other phenomena during the Holocene period. The present scenario of change in climate in major geographical area of the IGP will continue to remain as a potential threat. Situation of this nature will therefore, demand careful management intervention in terms of restoring and maintaining soil health for sustainable agricultural production in the IGP. See page 1193.