In this issue

Simulation of severe thunderstorm using WRF–NMM model

Thunderstorm, resulting from vigorous convective activity, is one of the most spectacular weather phenomena in the atmosphere. Many parts of Indian region experience thunderstorms at higher frequency during pre-monsoon months (March–May). During April and May, the eastern and northeastern parts of the country, get affected by higher frequency of severe thunderstorms, locally named as 'Kal-baishakhi' or 'Nor'westers'. These severe thunderstorms associated with thunder, squall lines, lightning, torrential rain and hail cause extensive loss in agriculture, damage to property and also loss of life. The casualties reported due to lightning associated with thunderstorms in this region are the highest in the world. The strong wind produced by the thunderstorm is a real threat to aviation. The highest numbers of aviation hazards are reported during occurrence of these thunderstorms. In India, 72% of tornadoes are associated with Nor'westers. These severe thunderstorms have significant socio-economic impact in the eastern and northeastern parts of the country. The understanding of the dynamical/physical mechanisms of these thunderstorms is essential for improving the forecast of these events.

Forecasting thunderstorms is one of the most difficult tasks in weather prediction, due to their rather small spatial and temporal extension and the inherent nonlinearity of their dynamics and physics. Numerical modelling has made substantial advances in the modelling of such intense mesoconvection systems. The WRF–NMM model will be used for a wide range of applications, from idealized research to operational forecasting, with an emphasis on horizontal grid sizes in the range of 1–10 km. This model can resolve the small-scale weather features such as front, localized convection, hurricane core, and topographic effect much better than the global model. This state-of-the-art mesoscale model is used in the study to perform cloud-resolving simulation of a severe thunderstorm. This is the first attempt in India, in using WRF–NMM model for thunderstorm simulation with horizontal grid resolution of 3 km. See **page 204**.

Sand extraction from agricultural soils

Sand supply from riverbeds to Bangalore for construction projects is not able to meet the demand of booming industry. Non remunerative crop cultivation coupled with failing monsoon in recent years has forced farmers to search for alternative income generating options and sand extraction has provided one such opportunity. Enterprising farmers and many rural contractors have taken up

extraction of sand by washing surface soils of agricultural fields. Nearly 25 per cent of sand supplied to Bangalore now is from this source. A field investigation and laboratory analysis undertaken to understand ecological and economic consequences of sand extraction revealed that significant employment and economic gains are realized at an ecological cost around Bangalore. Loss of surface soils, nutrients depletion, crop yield reductions, siltation of tanks, excessive groundwater exploitation and soil erosion are taking place due to sand extraction. There are no quality differences between riverbed sand and soil extracted sand. The enterprise has also opened few new opportunities for diversifying rural enterprises and also in complimenting farming activities if managed with care. Comprehensive policy and research efforts to address certain negative aspects are needed urgently to make the enterprise ecologically tolerable and safe. See **page 243**.

Endophytic fugal isolates

Historically, the microorganisms such as fungi, bacteria and actinomycetes are among the most prolific producers of bioactive compounds such as antibacterial, antimycotic, anticancer, antiviral and immunosupprevise agents. Since soil fungi have already been studied exhaustively for their tremendous potential as producers of bioactive compounds and consistently growing demand compel us to search for new alternative and unique resources, and regarding this the biology and chemistry of endophytic fungi are relatively less studied.

On **page 228**, Kharwar *et al*. have discussed about the endophytic fungi which could produce new bioactive natural products of host origin. In search of these bioactive compounds they chose *Catharanthus roseus* (L.) G. Don, as a source plant known for its anticancerous alkaloids. They have isolated good numbers of endophytic fungal isolates from this host. The sampling sites with two distinct ecological set up were used to isolate endophytic fungal community. Results show that these two set ups could not make significant impact on endophytic colonization and relatively similar 'core group' of endophytic mycoflora was recovered at both sites. A total of 13 fungal taxa and 183 isolates were isolated and most of them were identified with their morphotaxomonic features. The presence of higher colonization frequency of endophytes in leaf and stem tissues at loc 2 (relatively stressed conditions) suggests a relationship between high tissue colonization and the stressful environment in which the plant survives. Perhaps tissue colonization by endophytes plays some role in the ability of the plant to withstand heat/or drought stresses.