In this issue

Butterflies

Butterflies are perhaps the most enchanting organisms in this universe that have fascinated human imagination and creativity. Although India has a rich butterfly fauna, due to various reasons such as habitat destruction, fire, use of pesticides and weedicides and illegal collection for trade, many species have become very rare and some are on the verge of extinction. Species extinction has serious implications on the survival of mankind in this universe and it has been stated that extinction of a single species may lead to the disappearance of a dozen or more species. Hence, we have to take measures to conserve the biota present in specific ecosystems.

Legal status of protection has been granted to butterflies under the Indian Wildlife Protection Act enacted in 1972. However, few measures seem to have been taken up for their

conservation. Involvement of the public is essential for the success of any conservation programme. It is with this objective that methods have been standardized to conserve butterflies found in our surroundings by setting up 'butterfly gardens' through relatively simple methods involving introduction of appropriate, naturally occurring host plants and recreating the natural habitats. The concept of butterfly gardening is becoming increasingly popular in many states in India, especially Kerala, Tamil Nadu and Karnataka and we hope that, very soon, each homestead will have a butterfly garden and thus achieve both human enjoyment and nature conservation. See **page 337**.

Characterization of defensin Tfgd2

Defensins are small cysteine-rich peptides of about 5 kDa size. Some of the characterized defensins show antimicrobial activity, particularly against fungal pathogens. Generally, defensins show a comparable global fold with the CS$\alpha\beta$ motif and highly conserved cysteine residues that form disulphide bridges. Very few amino acids are conserved in the defensin peptide sequences, except cysteine residues and this variation may

account for the variation in their function. Legumes are a good source of potent defensins. This prompted the investigators to try some new legumes for characterizing new defensins. Initial observations with the crude seedling extracts of *Trigonella foenum graecum* showed inhibitory effects on spore germination in *Pheoisariopsis personata* (= *Cercospora personata*), the late leaf spot fungus on groundnut. Hence, they chose to clone the ORFs of defensins from this legume. They have earlier characterized the Tfgd1, and showed its antifungal activity. Olli *et al.* (**page 365**) have characterized another defensin Tfgd2. While the Tfgd1 has 74 amino acid residues in the peptide, Tfgd2 has 72 residues. The deduced peptide sequence of Tfgd2 shares greater similarity to the Medicago defensin compared to Tfgd1. When Tfgd1 and Tfgd2 were modelled, the former showed a longer α-helix compared to the latter.

Growth of micro-crystals

B. P. Parekh *et al.* (**page 373**) propose a modified *in vitro* gel model for the growth of micro-crystals of biomaterials. Bio-mineralization and bio-crystallization phenomena are responsible for several diseases such as urinary calculi, crystal-induced arthropathies, gall stones, etc. Usually, the growth of biocrystals occurs in the soft tissues, blood vessels or cavities. Many biomaterials crystals are initiated at micrometre size with different morphologies. In a simple gel-based *in vitro* model, the growth inhibition of several bio-crystals of millimetre size has been successfully studied earlier. In the modified gel model, a small gel is set within glass slide and cover slip in a petri dish. By properly pouring suitable reactants in petri dish the growth of micro-crystals of desired material is achieved. This technique is rapid, economical, needs less amount of material and can be used in batches in aseptic conditions with *in situ* observation facilities under optical microscope. For *in vitro* studies of growth inhibition or dissolution of bio-materials crystals, different solutions and herbal extracts of Ayurvedic plants under aseptic condition can be tested. This is exemplified by considering the growth of urinary type calcium hydrogen phosphate di-hydrate (CHPD) micro-crystals of different morphologies. The growth inhibition and dissolution of CHPD micro-crystals has been successfully demonstrated for citric acid solutions in aseptic medium. This model provides a screening tool for the drug development to clinical pharmacologists.