In this issue

Cinderella's new shoes – how and why insects remodel their bodies between life stages

Metamorphosis in insects is a remarkable phenomenon where the larva undergoes a striking morphological reorganization to give rise to the adult. Mainly three kinds of metamorphosis are observed – ametaboly (no metamorphosis, i.e. juvenile and adult are identical), hemimetaboly (juvenile or nymph resembles adult to some extent) and holometaboly (juvenile or larva and adult are strikingly different). How does an insect remodel itself so completely from one life stage to another so as to appear like an entirely different creature and why does it do so? The process is under endocrine control,

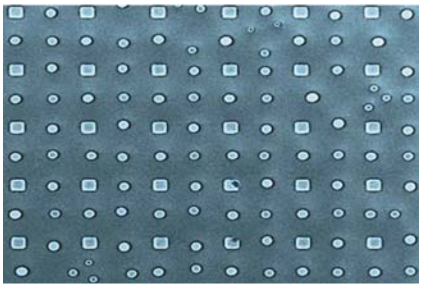
mediated by hormones like JH and ecdysone which modulate the expression of various genes like *BR-C*, *Kr-h1*, etc., which in turn modulate a cascade of other genes causing physiological and structural changes and resulting in remodeling the insect body. Shift in timing of production of JH and ecdysone peaks probably resulted in evolving holometaboly from hemimetaboly. The evolution of insect wings is likely to have caused problems in molting and thereby resulted in termination of molting at the adult stage. Probably differential selection pressures for juveniles and adults led to reduction of wings in juveniles, rendering them less vulnerable and capable of invading new microhabitats. Following this, the diversification between early and late instars gave rise to metamorphosis. See **page 1028**.

Genetic identification of sister species – tiger and leopard

Tiger genomics is rapidly gaining importance to address various issues related to the conservation of this species. In addition to population census, non-invasive genetic techniques can help us gain valuable insights into wildlife forensics, individual movement, gene flow, population structure, mating systems and behaviour. However, Bhavanishankar *et al.* (**page 1063**) caution all conservation geneticists working on non-invasive samples from tiger about the potential risk of misidentifying chiefly leopard samples as that of tiger. Species misidentification can get grossly magnified at the level of individual identification and paternity assignment to population structure and genetic diversity as these analyses draw conclusions based on presence of mismatches between individuals. A vast diversity of carnivores, both felids and canids, live in sympatry in tropical forests. There is an urgent need to establish rigorous and accurate methods for species identification from limiting amounts of DNA. Microsatellite genotyping of one species also requires the identification of private alleles in sympatric species to prevent erroneous conclusions.

Nanolenses

Nanolenses that can overcome the diffraction limit by capturing the near-field evanescent waves and refocusing them in the far-field image plane have tremendous promise for the low-cost, high-resolution optical microscopy working even beyond the diffraction limit. Verma and Sharma (**page 1037**) present a comparison of various state-of-the-art top-down and bottom-up fabrication methods for nanolenses with their merits and limitations with focus on their recent work on self-organized fabrication of polymeric nanolens arrays. Highly confined, unstable polymer thin (< 50 nm) films spontaneously transform into micro-droplets by a spinodal surface instability leading to



dewetting. The lateral length scales of these self-organized structures in air are limited by the weakly destabilizing van der Waals force and a strongly stabilizing surface tension. Limitations on slow dewetting kinetics and relatively large (> 1 micron) length scales can be overcome by dewetting induced under an optimal mix of a non-solvent (water) and a good solvent, which reduce the interfacial tension to nearly zero without a concurrent solubilization of the polymer. This room temperature technique reduces both the time and the length scales of dewetted structures by over one order of magnitude. Further, directed dewetting combined with physico-chemically patterned substrates and films by e-beam, photolithography, laser ablation and nanoimprint lithography techniques can be used for fabrication of ordered nanostructures such as arrays of nanolenses. The self-organization under a reduced surface energy environment has tremendous potential in the patterning of functional materials in a variety of applications ranging from opto-electronics to sensors.