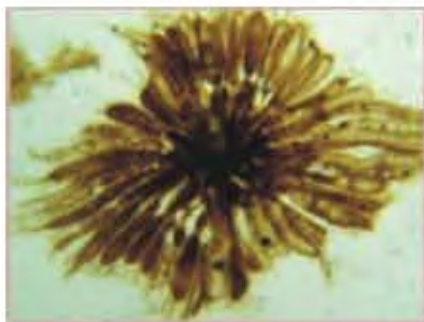


## In this issue

### Non-pollen palynomorphs as palaeoenvironmental indicators

Non-pollen palynomorphs (NPP) are organic-walled microfossils that are found frequently in the palynological preparations during pollen analysis. Like pollen and spores they too are preserved because of sporopollenin-like substance. NPP constitute an important source of palaeo-information in the lagoonal sediments of Kerala basin and pollen pauper sediments of Gujarat basin deposited during the relatively drier periods of Late Quaternary. Till now, NPP have not been addressed in ecological and environmental perspective.



Limaye *et al.* (page 1370) discuss the NPP data retrieved from the west coast of India as a source of additional palaeo-information. The relative abundance of NPP and their proportion with conventional palynomorphs can be used to interpret oscillations in atmospheric precipitations in the Gulf of Kachchh region, which corroborates with the available micropalaeontological and mineral magnetic data. *Botryococcus* and *Pediastrum* are found to be indicators of hydrological changes associated with the evolution of lagoons, whereas the oil fungus *Glomus* is suggestive of erosion indicator in the supratidal soil environment at Lothal. Cyanobacteria (*Rivularia* type) infer phosphate eutrophication of wetlands of the coastal plains and their relative abundance may be explained by nutrient-rich habitats around the coastal plains due to grazing and agricultural practices during the Holocene. Microscopic charcoal and charred epidermal

fragments of Poaceae relate to fire-associated events including human impact. Higher concentration of Thecamoebians in Lothal (Gujarat) and Pachha (Kerala) indicates disturbed or stressed environment during the Late Holocene.

### Versatile sexual polymorphism and mixed mating

Reproductive excellence holds the key of any species for its sustenance, flourishing, genetic improvement and evolution. The knowledge regarding the breeding system is a prerequisite to understand the efficiency or failure of a species for genetic variation and evolutionary success.

*Withania somnifera*, which is well acclaimed for its therapeutic uses, has gained much attention among scientists in multidisciplinary areas of research. It presents a huge variability in chemical constituents. More than 35 constituents have been isolated and characterized from its roots and leaves. A fascinating array of chemotypes with several fold variability in bioactive constituents have been reported from different parts of the world. An interesting outcome of the study is the exposition of the versatility of mating system presented by self-compatible hermaphroditic flowers of *W. somnifera*. Experiments indicate that individual flowers exhibit partial temporal dichogamy of protogynous type, in which stigma becomes receptive prior to anther dehiscence and remains exerted beyond the reach of staminal cone.

S. K. Lattoo *et al.* report (page 1390) the reproductive consequences of *W. somnifera* by considering three parameters, i.e. phenological events and pollination aspects, cytological studies and RAPD profile and all these aspects contribute scientifically potential proposition to understand the functional sequels of reproductive biology of the species.

### Distribution of wealth

Layman alike, many economists also dream for an equitable distribution of

wealth in an ideal society. They are, however, up against history. As Chatterjee *et al.* report on page 1383, the uneven distribution of wealth in any society seems to be inevitable and follows a universal law that holds true for economies in many different societies: from ancient Egypt, through nineteenth century Europe, to modern Japan and the US. The income and wealth distributions in various societies appear to be close to the Gibbs distribution of energy in an ideal gas in equilibrium, but also deviating significantly for high income groups. Application of physics models seems to provide illuminating ideas and understanding, complementing the observations.

### Resistance to *Aphanomyces invadans* infection

*Aphanomyces invadans* is regarded as the only essential infectious component of Epizootic ulcerative syndrome (the most serious epidemic disease affecting freshwater fish). Indian major carps are the major cultured species of the Indian subcontinent and younger specimens of Indian major carps appear to be highly susceptible to the disease. P. K. Pradhan *et al.* (page 1430) have tried to artificially infect the one year plus age groups (yearlings) of three species of Indian major carps and noted down their sequential inflammatory response against the pathogen. The injected zoospores of *A. invadans* had germinated the muscle tissue of all the fish but the germinated hyphae were prevented from proliferation and spreading to the neighbouring tissue. The biological activities of the germinated hyphae in the lesion area appeared completely suppressed and the lesion area appeared to be healed with well-developed regenerated muscle fibres. Well-developed epithelioid cell granulomata formation and extensive infiltration of inflammatory cells around the fungal hyphae in the lesion area have been reported to play an important role in resisting the infection against *A. invadans* in the yearlings of Indian major carps.