In this issue

The science of counting lizards

Snakes and dinosaurs may make up the public imagination of reptiles, but the most common and diverse group of reptiles are the lizards which range in size from 3 cm to 3 m and in weight from less than a gram to 350 kg. On **page 1363** of this issue, Bhagyashri A. Shanbhagh and her colleagues describe their efforts to develop a scientific methodology to count the numbers of one colourful and fascinating species of lizard, the so-called fan throated lizard or *Sitana ponticeriana*. Walking along previously laid out transects and counting the numbers of lizards encountered at different times of the day and on different days, they estimate the population size of the species. This methodology and this estimate are meant to serve as a benchmark for repeated estimates in the coming years. Now, why should anyone spend their time and public money (very little money, it must be admitted) counting lizards in a cotton field in Gabbur village, you may legitimately ask. The state of our rapidly deteriorating environment needs to be monitored and one of the many ways of doing so is to identify a manageable number of easily studied species of animals or plants, develop methods to estimate their abundance and follow the fate of their populations in time. Tedious as it is, this task is well within our reach, what with hundreds of universities and colleges with students and teachers of botany and zoology. And yet, we have barely made a beginning in this important exercise. The reasons for this are clear enough – we continue to teach botany and zoology as the study of dead plants and animals and continue to use species described in the West as model organisms. All this has to change rapidly and studies such as this one show that there is hope.

Plant antimalarials

Ever since Jesuit priests brought back to Europe the knowledge that the bark of the cinchona tree had anti-malarial properties, the search for new antimalarials from plant sources has continued. Quinine from the *Cinchona* species was the first widely used antimalarial drug, supplanted only in the mid-20th century by the synthetic chloroquine. The development of chloroquine-resistant parasites has triggered a new urgency in the search for antimalarials. The most promising development has been the introduction of artemisinin, isolated from a Chinese plant *Artemisia annua*. Saxena *et al.* (**page 1314**) provide a comprehensive review of the effects of crude extracts and secondary metabolites of diverse structure on malarial parasites. The ethnopharmacological approach may point to a promising route to new drugs for malaria.

X-ray diffraction for biomass–effluent interaction studies

Dairy effluents are produced at two stages: one at the dairy with livestock and another at the stage of milk processing. The first stage produces effluents in the form of faeces and urine from the livestock, associated wash waters and contaminated drainage. Milk processing effluents are due to milk and its dissociated products. These effluents find their way into water bodies as a result of point or dilute discharge. The water bodies become rich sources of nutrients on which aquatic life (bacteria, algae, fungi, plants and the like) can survive and grow. In fact, compared to terrestrial plants, aquatic plants, for example algae, have high growth and nutrient uptake rates. In freshwater system, as nutrient levels increase, phytoplankton growth becomes dominant, leading to water quality and environmental degradation. The algae are known to be toxic to animals and humans. The formation of cyanobacteria blooms can also take place. According to a FAO report, 'in recent years a commonly occurring aquatic plant, "duckweed", has become prominent, because of its ability to concentrate minerals on heavily polluted water such as that arising from sewage treatment facilities'.

A number of studies are undertaken to study the interaction of the chemical constituents in the effluents and the aquatic life for various reasons. If some aquatic plants can be used as alternatives to manure, some are useful to remove certain organic, inorganic and metallic pollutants from water bodies. Hence these studies are important. However, most of the studies are based on chemical analysis.

'Cyanobacteria are aquatic and photosynthetic. They are small and usually unicellular bacteria without a membrane-bound nucleus though they often grow in colonies large enough to be seen. Many proterozoic oil deposits are attributed to the activity of cyanobacteria. They are also important providers of nitrogen fertilizer in the cultivation of rice and beans. Cyanobacteria have also been important in shaping the course of evolution and ecological change throughout earth's history. The oxygen atmosphere that we depend on was generated by numerous cyanobacteria during the Archaean and Proterozoic Eras. The other contribution of the cyanobacteria is the origin of plants. The chloroplast with which plants make food for themselves is actually a cyanobacterium living within the plant's cells. Because they are photosynthetic and aquatic, cyanobacteria are often called "blue-green algae". This name is convenient for talking about organisms in the water that make their own food, but does not reflect any relationship between the cyanobacteria and algae, which possess cells with a nucleus.'

In a paper (**page 1330**), Kanika Sharma and coworkers have used X-ray diffraction technique for studying interaction of effluents from a milk processing plant with cyanobacteria. Presenting this as a novel technique, the authors note that 'the X-ray diffraction study, in addition to corroborating the results obtained by conventional methods, also gives more specific information. Moreover, it is a fast and efficient method of monitoring the systematics of biomass–effluent interactions'.