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To kill by pill or by kernel? Risk of purity

One of the major differences between the Ayurvedic and Allopathic medicinal systems is with respect to the diversity of compounds or remedial agents they use in their formulations. Ayurvedic system generally attributes the cure of an ailment to the entire system of say, a plant or its extract. Allopathy on the other hand, attempts to extract a specific chemical from the complex system, purifies it, and prepares pills out of it. It believes that there is one chemical for one cure.

This difference between the two systems in their approach has been a subject of an unresolved debate for long. Followers of Ayurvedic system claim that most of the side effects that are so frequently associated with the allopathy is because of an over emphasis on, and administration of, higher doses of single chemicals. Allopathy is inimically deaf to this claim and persists with its love for distilling and concentrating the chemicals. There are not many studies testing whether this does cost and the study by Kumar and his group reported in this issue (page 1459) appears to support the claim by the Ayurvedic medicine system.

Traditionally, Neem Seed Kernel was being extracted in water and used for treating a multitude of ailments and other purposes, the most prominent among them being its use as a pesticide. Interestingly, the effect of the neem kernels is known to be due to a range of compounds but major among them is Azadirachtin. But once the neem seed's 'Aristha' (cure all) feature became to be well known, modern chemical technology *a la* allopathy began to extract this major component Azadirachtin and formulations with higher and higher concentrations were released in the market.

The question that Kumar's group addresses is whether increased concentration of Azadirachtin retains the pesticide potency of the neem kernels. Their study shows that, with increasing concentrations of this chemical we need relatively more and more of it to attain a given level of mortality of the pests. They argue that as the chemical is purified, we are having eliminating more and more of the other useful compounds that would have otherwise contributed to the pesticide effects – a clear demonstration of the fact that purity often costs and hence we better kill by kernel extracts than by the pills made out by extracting the chemicals from the extract.

K. N. Ganeshaiah

Thermoluminescence

S. K. Bhattacharjee (page 1419) used a recently developed microprocessor-based thermoluminescence (TL) recording instrument to detect TL in spinach leaves, identifying a stimulation of TL by thermal fluctuations that is different from the usually observed TL in the chloroplast. Accordingly, the author proposes a 'quantum confinement model' as an alternative to the classical trap model, to explain the new observations. The author argues on the fluctuations and the reproducibility in the system and postulate that '*in vivo* nano-particles with property of quantum confinement' is involved in TL.

Non-dominant queens

Social organization in insects is an important model in understanding behavioural instincts and relationships. Primi-



tive eusocials usually lack queen-worker dimorphism (e.g. wasps); whereas advanced eusocials usually exhibit a queen-worker dimorphism in large colony sizes (e.g. ants). Sumana and Gadagkar (page 1464) describe the social behaviour of their favourite insect, *Ropalidia marginata*, a primitive eusocial. Surprisingly, *R. marginata* queens are docile, and can serve as a model organism to understand the differences between physical inhibition and chemical pheromonal regulation deter-

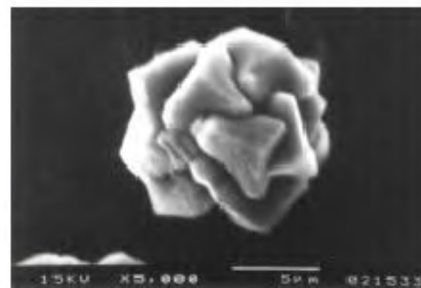
mining the mechanism of worker reproduction, as it occurs during evolutionary transition from the primitive to the advanced eusocial.

Molybdenum enzymes

In the biochemists view of the Mendeleev's periodic table of elements, molybdenum is the only 4D transition metal playing a prominent role in enzymatic reactions. Molybdoenzymes contain mononuclear molybdenum, catalyse diverse reactions that are important in cycling of nitrogen, sulphur, carbon and arsenic. Basu *et al* (page 1412) survey the Cambridge database to delineate the details of Mo-coordination chemistry to provide insights into structure-activity relationships in molybdoenzymes.

Calcite tobacco film

Sinha *et al.* (page 1437) describe self-assembled growth of calcite particles on



a film prepared from an aqueous solution of dry tobacco leaves. Calcite crystals can be formed by precipitating from a solution containing CaCl_2 in tobacco solution liquor adding Na_2CO_3 . The crystalline material is characterized by scanning electron microscopy (SEM) and X-ray diffractometry (XRD).

Reproductive behaviour

Ornamental fish catopra, same as *Pristolepis marginata*, is commonly found in the Western Ghats. With large eyes, and short oblong compressed and grayish body, it is one of the indigenous varieties of fish popular in domestic aquarium. Anna Mercy *et al.* (page 1468) report a study on the reproductive behaviour of catopra in captivity.

S. Ganguli