

## In this issue

### Photothermal manipulation of carp reproduction

Assured supply of quality carp seed has been considered as a critical input for sustainable expansion of freshwater aquaculture practices. The future demand of carp seed of consistent size, quality and specification throughout the year for grow-out culture to achieve the estimated target of freshwater fish production to the tune of 5.4 million tonne from aquaculture by AD 2012 has been a challenge for researchers. Indian major carps are seasonal spawner and spawn mainly during monsoon in this subcontinent. To cater the increasing demand of quality carp seed, extrapolation of breeding period in carp to achieve year-round seed production is being felt necessary to increase the country's aquaculture production. Sarkar *et al.* (page 960) report significant advancement of sexual maturation of Indian major carp species, rohu (*Labeo rohita*), catla (*Catla catla*) and mrigal (*Cirrihinus mrigala*) through the process of photothermal manipulation. Females and males of all the



Mature Rohu female ready for breeding during winter month

species obtained gonadal maturity suitable for induced spawning between 100 and 124 days of rearing and produced a similar quantity of eggs and spawns except mrigal. The process of photothermal manipulation of carp reproduction is climate independent, advantageous to make need based production schedule considering the availability of space. This technique may be adopted for

gonadal maturation and spawning of the potential fish species in the winter belt of the country as well as the temperate zone of the world.

### Presence of $^{60}\text{Fe}$ in eucrite Piplia Kalan

The isotopic records preserved in meteorites play an important role in understanding the origin of the solar system around 4.56 billion years ago. In this regard, the presence of the two now-extinct, short-lived nuclides,  $^{26}\text{Al}$  and  $^{60}\text{Fe}$ , in early solar-system phases contribute significantly to our understanding of the early solar-system processes. The presence of these short-lived nuclides in the meteorite samples derived from the differentiated asteroid, Vesta 4, facilitates in constraining the time-scale associated with the accretion and subsequent planetary differentiation of planetesimals and asteroids in the early solar system. Rudraswami *et al.* (page 948) measure the initial abundance of  $^{60}\text{Fe}$  in the meteorites Piplia Kalan, an igneous sample that is known to have been probably derived from the differentiated asteroid, Vesta 4. The initial abundance of  $^{26}\text{Al}$  in this sample has been estimated earlier by Srinivasan *et al.* (2009) that indicated the formation, melting and crystallization of the differentiated body in early  $\sim 5$  million years. The Fe-Ni isotope systematic in the present study on Piplia Kalan using Secondary Ion Mass Spectrometer (Cameca IMS-4f at Physical Research Laboratory, Ahmedabad) provides an initial  $^{60}\text{Fe}/^{56}\text{Fe}$  of  $(5.2 \pm 2.4) \times 10^{-9}$ . Unlike  $^{26}\text{Al}$ , this rules out  $^{60}\text{Fe}$  as a major heat source for planetary differentiation. Further, it also suggests that the initial  $^{60}\text{Fe}/^{56}\text{Fe}$  of  $(5.2 \pm 2.4) \times 10^{-8}$  in early solar system is far less than that expected previously. Finally, it seems that a massive star during its supernovae stage injected  $^{26}\text{Al}$  and  $^{60}\text{Fe}$  in the solar system.

### Betel vine – waiting for resurrection

*Piper betle* (L.) or betel vine is one of the important plants in the Asiatic region ranking next to beverages, coffee and tea in terms of daily consumption. In this issue, Nikhil Kumar *et al.* (page 922) provide evidences of useful values of betel vine, both real and potential. The plant, though much maligned for abuse, has in recent years been reported to have several beneficial or significant effects on biological activities through the plant extracts and various chemical constituents. The leaf extract, its fractions and various purified compounds have a role in oral hygiene, cardiovascular disorders and as anti-diabetic, anti-inflammatory, immunomodulatory, anti-ulcer, hepatoprotective and anti-infective actions. As an interesting perspective, the traditional chewing and masticatory use of *P. betle* offers possibilities of use in drug delivery through buccal mucosa bypassing the more common gastric route. The article highlights several important phytochemicals of betel vine and their uses in different aspects of human health care. The potential for commercial/industrial exploitation of betel vine is indicated through a summary of several patents already granted or filed on this interesting plant and its constituents. Existing biodiversity of this plant needs further exploration keeping dioecy in view. Due to obligate vegetative propagation, the plant is also a strong candidate for using as transgenic plants for therapeutics.

Considering that betel vine is also a traditional and a heritage plant for us in India, the maligning of the plant vis-à-vis cancer-causing, habit-forming plants and as a narcotic (habit-forming mild stimulant) represents an unusual conundrum that can only be unraveled by more R&D on this plant.