

In this issue

Saving Water

Hydrogels in agriculture

Indian agriculture is heavily dependent on the monsoons. More than 60% of the sown area has no access to irrigation. Scarcity of water in agriculture is a limiting factor in reaching the productivity needed to feed the future.

Enter hydrogels. After taking medical research by storm, hydrogels are now on their way to becoming a favourite with farmers. The hydrophilic groups in the cross-linked polymers of hydrogels absorb large quantities of water without dissolving.

Unlike the hydrogels for medical uses, agricultural hydrogels should not only have the ability to absorb water, but must release the same gradually according to the specific requirements of the plants. Scientists at the G.B. Pant University give us a brief outlook derived from the experiments and field trials in a General Article on **page 1773** in this issue.

A mere 1 to 2 kg/acre of hydrogel is effective for most crops. The material – cross-linked polymers of polyacrylamide – is not toxic. However, magnesium and calcium ions in the soil slowly make the gels less effective over time. If the cost can be brought down, the hydrogel may find huge demand from the agriculture sector.

Move Over Mozart

Indian ragas improves cognition

A wide range of studies published in the last two decades claim a positive effect of music on cognition and task performance. Most of these studies used western classical music in their experiments. The results were popularized as the Mozart Effect in folk literature and media. But now, a Research Article on **page 1795** in this issue says that the Malahari and Kapi ragas also influence cognitive performance.

Technologists from four different institutions distributed in Chennai, Dindigul and Vellore in Tamil Nadu tested the effects of these ragas on 20 participants. None of the participants had musical training but were all fond of listening to music. The two ragas were chosen by the participants out of a

choice of three. The participants did a simple task – visual Go/no Go – that allows assessment of sustained attention while listening and not listening to music of their choice.

The researchers used the self-assessment manikin scale and positive and negative affect schedule to keep track of the valence, arousal and mood. Interestingly, besides changes in the physiology and mood, they found that the reaction time while listening to music was also reduced. Both errors of commission and of omission were reduced considerably, while listening to Kapi and Malahari.

Malahari is a morning raga, believed to improve concentration. Instrumental rendering of the raga was used in the experiment. Kapi raga can be played at any time. An Indo-Jazz rendering of the raga was used. In both cases, background music improved cognitive performance. Thus, evidently, it is not only western classical music that has this property. Is it the multifractal nature of both western and eastern music that is the key?

Obstructive Sleep Apnea

It is estimated that 7.5% of Indians suffer from obstructive sleep apnea, a continuum of disorders from snoring to the Pickwickian syndrome where hypoventilation leads to increased inflammatory mediators which cause physiological damage. There is evidence that the brain – especially the forebrain and hippocampus – of such patients have reduced grey matter densities.

Scientists at the Topiwala National Medical College and BYL Nair Charitable Hospital, Mumbai, took 30 cases of people with the symptoms to compare with matched controls. In a Research Communication on **page 1825** in this issue, they provide evidence to show decrease in attention as well as visual and auditory choice reaction time among people with sleep apnea.

Though there is no significant difference in general intellectual functioning, psychomotor abilities and speed seem to be impaired among apnea cases. Perhaps a part of the large

number of road accidents in India may be reduced if this factor is considered in the process of providing driving licences, suggest the authors.

Snoring is considered a normal phenomenon. So is obesity – one of the causative factors – in an emerging economy like ours. A conscious choice for a healthier lifestyle to reduce obesity and thus to reduce sleep apnea may perhaps be easier at an individual level.

Dolphin in River Beas

Partitions pose threat

The dolphins in the Indus, *Platanista gangetica minor*, never got the celebrity status of *Platanista gangetica gangetica*, the Gangetic river dolphin, which has been in the news for long. The Indus River runs through around 3500 km. But the division of India and Pakistan and further fragmentation of the river by barrages impacted the population of the dolphins. Now, 99% of the population is restricted to a mere 690 km stretch of the river. They are already extinct in all the tributaries of the Indus in Pakistan. So the sub-species has entered the IUCN Red List of endangered species.

The finding that the River Beas still sustains the sub-species is heartening. A Research Communication on **page 1859** by Mohd Shahnawaz Khan from WWF India, now gives a more detailed estimate of the population. For two years, from April 2011 to May 2013, he made seven vessel-based collinear line transects of 10 km each once every month, covering the 70 km long stretch of the River Beas from Beas city to the Harike Wildlife Sanctuary in Punjab to delve into the distribution of the dolphins in various seasons.

From November to February when the waters are low, the dolphins have a very small range. This, combined with low local abundance and intensive fishing activities, put the dolphin population at very high risk, says the Research Communication. The protection of dolphins in the River Beas has to be taken up as a national priority.

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