In this issue

Fish as a Model

For pharmacology research

Fish are closer to humans than fruit flies, one of the most used models in biology. Fish reproduce faster and have higher fecundity than mice or rats and are also easier to rear in the laboratory. So, naturally, fish have been used as a model for two centuries, longer than many other model organisms. Fish cell lines, too, have found their way into many laboratories around the world.

However, considering that there are more than 34,000 fish species with wide interspecies variations, the selection of the fish model appropriate to the questions to be solved is problematic.

A Review Article in this issue explores the scope of using fish as a model organism in experimental pharmacology – not only to assess genotoxicity and as disease models but also for transition to clinical trials and in regenerative medicine. The authors also spell out possible shortcomings and caveats in using fish as a model in pharmacological studies.

Read on from **page 1199**.

Oral Cancer

Identifying critical proteins

India has a fair share of patients with oral cancer due to betel nut and tobacco use. Researchers from the Central University of South Bihar set about identifying the proteins involved in the pathology. They took data on oral cancer from three different databases and identified 47 over-expressed genes that were common in all three.

Network analysis to understand the relationships between the genes led them to three clusters of possible protein–protein interactions. Gene ontology analysis distinguished genes involved in biological processes, molecular functions and their cellular components.

The team was thus able to identify 15 genes central to the development of oral cancer. These genes or their protein products could be used as biomarkers for the early identification of oral cancer or as targets for developing chemotherapy, say the authors.

Read the Research Article on **page 1216** for details.

Butterflies and Birds

In Tamhini Wildlife Sanctuary

Anand Padhye, Garware College, Pune has been studying wildlife in the northern Western Ghats region for some time now. Between 1998 and 2001, he and his students studied the diversity of birds and butterflies, indicator taxa, at two trophic levels. In 2016–17, he repeated the study with his student, Shawn Dsouza. They used the same seven transects, covering various types of habitats: riparian, evergreen forest, human habitation with cultivated land, and scrubland and grassland. Every fortnight for a year, they recorded bird and butterfly abundance. Now they compare their data with the earlier study.

They found a significant increase in the diversity of birds. The increase in the diversity of butterflies was not that significant. The researchers also noted a larger increase in the diversity of generalist butterfly species. Among birds, there was a large increase in insectivorous birds and a moderate increase in omnivorous bird species.

What could be behind these transformations in the abundance and diversity of the ecological indicators? Is it the establishment of a wildlife sanctuary? Perhaps not; there are other factors, say the researchers. Read the Research Article on **page 1253** in this issue to find out.

Indian Kino Tree

Eocene forests of Rajasthan

Geologists from the H.N.B. Garhwal University recently recovered a thin, laminated, maroon shale with two fossilized leaflets from the Gurha opencast lignite mine in Rajasthan. The maroon shale belonged to the Palana Formation, dating the fossil as remains of a plant from the early Eocene, more than 50 million years ago. They collaborated with palaeobotanists from the Sidho-Kanho-Birsha University to identify the plant.

From the leaf characteristics, the palaeobotanists determined that the leaflets were of the Fabaceae family. They compared the leaf characteristics with those of extant plants and homed in on nine species. Further detailed examination showed closest similarity with the Indian Kino tree, *Pterocarpus marsupium*. But unlike *P. marsupium*, the fossil leaflets had symmetrical lamina. The researchers named the fossil species, *Pterocarpus emarginaticus*, after the emarginated or notched appearance of the leaflets.

Taking into account this particular fossil as well as fossils of fauna found earlier, the researchers suggest that the arid region of the present-day Rajasthan had tropical forests, which thrived under warm and humid climatic conditions during the early Eocene. Read the Research Communication on **page 1264** in this issue for details.

K. P. Madhu
Science Writing Consultant
scienceandmediaworkshops@gmail.com