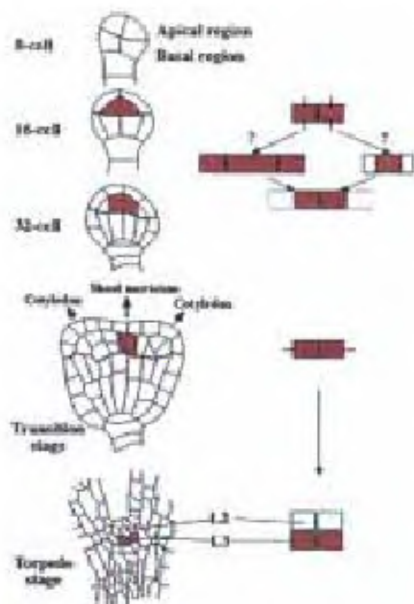


In this issue

Plant embryology and Panchanan Maheshwari

In an article marking the birth centenary of the eminent plant embryologist, the late Panchanan Maheshwari (page 1660), Raghavan traces the changing emphasis in research in the embryology of flowering plants from Maheshwari's time to the present. Maheshwari pioneered research in descriptive, comparative, and experimental embryology, involving control of fertilization, embryo and endosperm development in plants belonging to widely



scattered families. Investigations in descriptive embryology highlighted the diversity in cell division patterns during embryogenesis of plants. In the area of experimental embryology, by culturing ovules and pollen grains in a test tube, it was possible to secure controlled encounter of the egg and sperm in the process of test-tube fertilization. The trend in present-day research is to gain insights into the genetic and molecular mechanisms that modulate the development of the complex embryo from the single-celled zygote and of the endosperm from the primary endosperm nucleus, using *Arabidopsis thaliana* as a model system. This approach has been possible by the isolation of mutants that affect the development of the embryo and

endosperm, cloning of the mutated genes, identification of their protein products, and transgenic approaches.

Migration malaria

Malaria is a major public health problem in Madhya Pradesh (MP). Most of the malarious districts of the state are forested and endowed with rich natural resources. Persistent malaria transmission is the characteristic feature in most forested areas. Malaria imported from one district to another has become very common in MP recently due to dramatic increase in migration related to occupational activities such as food gathering and collection of forest produce. However, epidemiology of migration malaria is very complex. Neeru Singh *et al.* (page 1696) have attempted to understand how migrants have affected the epidemiology of malaria.

Thirty nine labourers from 14 families from Panagar PHC, district Jabalpur (malaria-free urban area) visited the dense reserve forest of Panna district for about 3 weeks for collections of mahua (*Madhuca indica*), the flower used for making country liquor (generating good revenue in the local market). These labourers slept under the mahua tree to protect flowers from grazing animals as mahua flower drops after midnight. This is a very common phenomenon in the mahua forests of MP. This results in a mix of immune and non-immune population. These labourers spent the night in the open presumably providing a source of infection to the anopheline prevalent outdoors. These people returned to their home in the 2nd week of April and within 2 weeks almost all of them developed high fever of which 3 died.

Though district administration put all the surviving migrants in the district hospital to provide radical treatment to protect the community, they were intimidated by the severity of symptoms and death of their companions in a short time and most of them left hospital against medical advice to perform religious ceremonies in a different part of the country i.e. from MP to Uttar Pradesh (UP) thereby disseminating malaria all over.

Thus the immediate challenges are to improve dissemination of health advice before travel begins. Malaria is a preventable disease. It is possible to enjoy a malaria-free trip in forest villages provided adequate preventive measures are used.

Residue burning in rice wheat cropping system

Rice wheat cropping system (RWS) is one of the widely practiced cropping systems in India, particularly in the Indo-Gangetic Plain that generates large amount of crop residue. Combine harvester, a product of intensive mechanization, leaves behind large amounts of loose straw in the field whose disposal or utilization is becoming difficult, compelling farmers to burn the residue to get rid of it easily.



Burning of crop residue results in emission of trace gases and particulates having impact on human health, air quality and regional climate. Prabhat Gupta *et al.* (page 1713) found that the emission estimates for Indian RWS for CH₄, CO, N₂O and NO_x in year 2000 were 110 Gg, 2306 Gg, 2 Gg and 84 Gg, respectively from the open residue burning. Crop residues are a good source of plant nutrients and are important components for the stability of agricultural ecosystem, however, burning may lead to considerable nutrient loss. Burning causes loss of soil C and N, organic matter and flora.

The straw left in the fields for open burning is of great economic value as livestock feed, fuel and industrial raw material. We need to discourage this practice of straw burning and stress on sustainable crop residue management practices, involving improved technologies, long-term research and implement policies for the same.