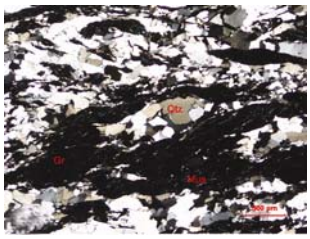
In this issue

Carbon isotopic evidence for the origin of Himalayan graphite

The carbon isotopic ratio ($^{13}C/^{12}C$) measured in natural graphite can discriminate in the origin of graphite occurring in diverse host rocks. This $\delta^{13}C‰$ of graphite can typically characterize the source of carbon involved in graphite formation as the graphite formed through the participation of biogenic carbon are enriched in ^{12}C, whereas the graphite formed from the abiogenic carbon comprises high ^{13}C. Sharma *et al.* (**page 1216**) present evidence for the origin of graphite found in Lesser Himalaya. The widespread graphite occur in Lesser and Higher Himalayan metasedimentary rocks particularly in the Kumaun Himalaya, wherein it is associated with the pelitic schists and gneisses. Small occurrences to sizable deposits of graphite are known to occur in



Precambrian crystalline rocks: Munsiari and its klippen such as the Almora Group of rocks. The carbon isotope data of the representative graphite from the Almora Group is presented in this study to delineate the origin of Lesser Himalayan graphite. The $\delta^{13}C$ values measured for studied graphite show enrichment of lighter carbon with $\delta^{13}C$ mean value as –29.08‰. These $\delta^{13}C$ values are, however, in narrow range and imply that the biogenic carbon participated in the formation of Lesser Himalayan graphite. The $\delta^{13}C$ values obtained for the graphite within the metasediments of Gumalikhet Formation are lower than those obtained for graphite from the Champawat Granodiorite Formation, close to the southern border of Almora nappe.

Golden catfish *Horabagrus brachysoma* on a come back trail

Captive breeding protocols of *Horabagrus brachysoma*, popularly known as golden catfish, endemic to the Western Ghat river systems, India were standardized and artificial breeding accomplished by hormonal manipulation, using ovaprim, an hormonal analogue of salmon gonadotropin releasing hormone (sGnRHa) and Domperidone. The fish, characterized by very high fecundity has been demonstrated to be amenable to artificial fertilization by stripping in 12–14 h after hormonal administration. This opened up opportunities for mass production of seeds of this species.

Being omnivorous, hardy and with high consumer preference and adapted to survive in oxygen-poor situations, *H. brachysoma* is an enormously potential food fish for farming and owing to its brilliant colouration, it is popular in the commercial ornamental fish trade as Asian sun catfish. The fish has been listed till recently as 'endangered' in river systems of the region. Artificial breeding technique has been of immense value in mass production of seeds for popularizing its farming as a preferred food fish and ornamental fish, and for open water stocking and species restoration.

Ranching of captive-bred young ones of the species, for conservation stocking has helped massive come back of the species in natural waters. This is a success story that demonstrates the value of captive breeding protocols not only for conservation and species restoration but also for commercial utilization. See **page 1232**.

Fighting adversity: bacterial style

Bacteria, especially pathogens, employ several strategies to counter life-threatening stresses. One of these is a process called phase variation which involves switching the expression of certain genes from the On state of expression to the Off state and vice versa. These genes are called 'contingency' genes and are characterized by some unique structural features and high frequencies of switching between the On and Off states. Generally, but not always, contingency genes are involved in the synthesis or modification of surface-associated cellular structures. The high frequencies of On/Off switching of their expression, several fold higher than spontaneous mutation frequencies, and presence of several contingency loci in a cell generate enormous population diversity in clonal populations of cells. Some contingency loci are not involved in the synthesis of surface-associated structures but are components of type I and type III restriction–modification (RM) systems. Phase variation in type III RM genes up or down regulate the expression of many unlinked genes, impacting on several properties of cells. This novel system of gene regulation has been called phase variable regulation or simply, phasevarion. In a review article appearing in this issue, Jayaraman discusses (**page 1163**) the organization of phase variable genes, the many mechanisms of phase variation and a related process called antigenic variation. How bacteria utilize phase variation to adapt to stressful life situations is discussed with examples.