In this issue

Light reactions of photosynthesis

Photosynthesis begins with light absorption within femtoseconds in pigment–protein complexes (antenna), followed by excitation energy transfer to reaction centres, where the light energy is converted into chemical energy within picoseconds. This then leads to electron transfer within milliseconds. The end products (the reducing power and ATP) of these reactions are then used to produce food and molecular oxygen in plants, algae and cyanobacteria by the well-known Calvin–Benson cycle. In this issue, Germot Renger (page 1305) provides an overview of the beautiful machinery where the very first steps of this wonderful process take place. This review deals, in basic physical–chemical terms, with the highly efficient conversion of Sun’s energy into chemical energy at the reaction centres, whose structures are now known at atomic level. It includes a discussion of primary reactions not only of oxygenic photosynthetic organisms (cyanobacteria, algae and plants), but of non-oxygenic photosynthetic bacteria. An understanding of how these biological nanomachines operate may lead to applications, which will help us solve the energy crisis facing our world. This review article is a part of an on-going series on ‘Photosynthesis and Global Issues’.

Sea turtles

Studies on threat to sea turtles on account of fishing practices like trawling and gill netting are carried out extensively in the past. However, only limited studies are attempted on the impact of longline fishery on sea turtles in the Indian waters. In view of the rapidly developing longline fishery in and around Indian waters, for exploitation of the high valued fishes like tunas, swordfishes and allied resources, a study was undertaken (page 1378) to understand the spatial and temporal extent of sea turtle bycatch in the longline fishery operating in the Indian exclusive economic zone (EEZ). The experimental longline fishing conducted by the tuna longline research vessels along the Eastern and Western EEZ during 2005–2008 recorded an average bycatch hooking rate of 0.108% sea turtles in every thousand hooks operated. This level of bycatch hooking rate is perhaps lower than the bycatch rate reported from different parts of the World Oceans. However, the study advocates the importance of more research and continuous monitoring of the incidental bycatch of the different turtle species and addresses the issue of possible stock depletion due to longlining, a relatively new fishing technology to the region. The importance of developing mitigation devices, modification to the fishing gear and creating awareness among the fishermen for avoiding areas of high sea turtle concentration and their migration route or safe release of sea turtles caught, etc. are some of the conservation and management policies that could be adopted to reduce the fishing mortality of the turtles. The need for cooperative research among the coastal nations to conserve the migratory sea turtle species is highlighted.

Anaemia in pregnancy: easily rectifiable problem

Anaemia in pregnancy is a serious public health problem. It leads to maternal mortality unless the women with low haemoglobin (<5.0 g/dl) are given blood transfusion. The Infant Mortality Rate (IMR) is in the range of 63–75 per 1000 live births.

A. K. Susheela et al. (page 1320) report an effective interventional approach to control anaemia in pregnant women; the procedure is simple and easily implementable in health delivery outlets. The focus is on withdrawing fluoride from ingestion. If urine fluoride is more than 1.0 mg/l, one need to take adequate care that fluoride-containing items are not consumed; fluoridated toothpaste is substituted with Ayurvedic pastes with less fluoride content.

A series of adverse reactions of fluoride consumption are known to occur in cells and tissues: (i) Production of less number of erythrocytes (RBCs)/abnormal erythrocytes by the bone marrow and other haemopoietic tissues due to inadequate thyroid hormonal stimulus; (ii) Reduced blood folic acid activity; (iii) Reduced microbial growth in the gut and inhibits vitamin B12 production by the probiotics; (iv) Loss of microvilli (brush border) in the intestinal lining, resulting in non-absorption of nutrients for haemoglobin biosynthesis. The merit of the procedure lies in reversing the damages caused, and within a few days upon withdrawal of fluoride.