

medicinal plants. The Field Research Laboratory (DRDO), Leh, Ladakh has initiated an extensive study on the propagation and utilization of this wonder plant. The people of Ladakh still prefer herbal prescriptions based on the Tibetan system of medicine.

Seabuckthorn is a plant of immense medicinal and nutritional importance to humans. Its fruits contain high amount of bioactive substances. It contains 5 to 100 times more vitamin C than any other known fruit or vegetable. Seabuckthorn pulp and seeds contain medicinal oil. Our experimental results showed that the pulp and seed contain 20 to 25% and 10 to 15% oil respectively. It is packed with carotenoids, tocopherols, rare fatty acids and phytosterols, giving it synergistic power to protect cell membranes and enhance cell regeneration. It has long been used in Asia for treating various skin conditions.

Seabuckthorn berry oil has a tremendous effect on skin regeneration. This was found especially useful in treating various conditions requiring enhanced cell regeneration, for example, burns, scalds or eczema-like damage. Its yellow colour is due to the high content of carotenoids. It is used for application of cell anti-ageing, enhance-

ment of microcirculation, antioxidant protection, epidermal regeneration, anti-inflammation, natural UV blocking and sun screen cosmetics. Seabuckthorn berry oil is especially rich in omega-7 series of fatty acid (palmitoleic acid). Making up around 30% of the total oil, this rare fatty acid is a key component in seabuckthorn berry oil and it can act as a replacement for other fatty acids in cell membranes. The oil of seabuckthorn effectively combats wrinkles, dryness and other symptoms of malnourished or prematurely aging skin and is utilized in anti-ageing skin cream and lotions.

The seed oil, which is an unsaturated oil, shows promise because of its light absorption and emollient properties as an ingredient in cosmetics, phytopharmaceuticals and UV skin protectant preparations. It absorbs strongly in the UV-B range (290–320 nm) and may therefore, be used as a natural sun-screen absorber². Seabuckthorn seed oil is an excellent source of essential fatty acids. It contains both linoleic and alpha linolenic acid in a well-balanced 1:1 ratio. Seabuckthorn seed oil contains over 140 mg natural tocopherols per 100 g oil. Phytosterols are also present at around 1%, consisting mainly of beta-

sitosterol. Also present are minor amounts of tocotrienols, a fascinating new group of active phytochemicals. Seabuckthorn is traditionally used in the treatment of gastric ulcers, and laboratory studies confirm the efficacy of the seed oil for this application³. With this combination of health-active components, it is no wonder that this oil has special medicinal effects.

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NEWS

The 32nd International Geological Congress*

The International Geological Congress (IGC) is an important world meet for earth scientists which takes place every four years. It is a venue where geoscientists present their best scientific results and conduct stocktaking, while deciding on the future course. More than 7000 participants from all over the world attended the 2004 IGC, hosted in Florence (Italy) – a great centre of European Renaissance, and an equal number of papers were presented in the 336 scientific sessions. The programme included technical sessions, field trips and workshops on specific themes before, during and after the congress. The inaugural session on 20 August set the tone for the deliberations that were to

take place in the succeeding days. Those who spoke on the occasion invariably stressed the role of geological sciences in the service of mankind; an oft-repeated word was 'sustainable development'.

Special symposia in the congress dealt with geological hazards, new concepts in global tectonics, and progress in many other geoscience projects that are of international interest. They also featured a wide range of topics such as Arctic geology, catastrophes in Earth history; geological hazards, sea-level changes, climatic changes, and application of remote sensing in geological prospecting. Another major highlight was how geological tools could be used to understand the heritage and culture of mankind. Understandably this had a special meaning in Florence – a treasure house of priceless artistic splendours (incidentally, the IGC coincided with the 500th birthday of Michelangelo's statue

of David, exhibited in Galleria Dell'Accademia in Florence).

Technical sessions (oral as well as poster) started on 21 August and the papers dealt with 'Assessment and responses to geological hazards', 'Risks in urban areas', 'Cities at risk', and 'Environment changes', particularly interesting to the delegates from fast growing nations such as India and China. Case studies from various regions of Europe, Russia and other parts of the world provided examples to be followed in optimizing the resource utilization, mitigation of damage as well as environmental safety. An important feature of the technical sessions on the following day concerned recent developments in the geological timescale and global correlations. Siting and design of critical facilities was also another important topic as these discussions provided some useful tips for delegates from developing coun-

*A report on the 32nd International Geological Congress held at Florence, Italy during 20–28 August 2004.

tries to grasp the problems, prospects and risks involved in these projects. Many issues in groundwater management in urban areas, engineering geology, landslides and hazard evaluation, styles of continental deformation, modelling of debris flow, space geodesy and plate motions, and the Himalayan tectonics became focal points of the subsequent presentations. Of special interest was a session on societal response to catastrophic geologic changes.

Papers on succeeding days covered many themes in geochemistry, high-pressure mineralogy, sedimentary petrology, and dynamics of lava flows and mapping of mantle plumes. The session on international geosciences projects discussed progress and results covering many areas ranging from chemicals in the environment to natural hazard mitigation. Some of the important themes included new concepts in global tectonics and sedimentation, coastal and deltaic depositional systems, advanced methodologies in palaeontology and related fields. Other themes dealt with stable shield tectonics and earthquakes, which featured papers on recent Indian earthquakes. Sessions on earthquakes continued onto the next day, which covered themes on earthquake recurrence and palaeoseismology. Sessions during the last two days included themes such as earth resources, remote sensing for mapping and monitoring geological hazards and geosciences education. The topics of the day also included mass extinctions, tectonics of Precambrian mobile belts and seismicity and active tectonics. The last day featured methane hydrates, results from the Ocean Drilling Programme cruises and the submarine slope instability.

Plenary lectures by leading earth scientists were presented on all the days. These lectures presented the perspectives and challenges in earth sciences – from the preservation of cultural heritage such as the leaning tower of Pisa to the prospects and challenges in exploring the offshore for oil and gas and carbon sequestration (a major global initiative to siphon off excess human-generated carbon in the atmosphere to geologic receptacles like deep ocean or even abandoned petroleum basins). These lectures summarized the current state of knowledge on each of the topics. Wallace Broecker, who made the presentation on sudden climatic changes, gave a memorable talk that cautioned the audience on nature's proclivity to trigger sudden climatic change by citing such examples from the geologic past. Broecker, who could

not come to the congress due to health problems, presented his talk sitting in his office in New York, and took questions live through telephone.

A major attraction of the meeting was Geoexpo, an exhibition where national geosciences bodies, manufacturers of equipment and publishing companies displayed books, recent instrumentation, data processing, field and laboratory techniques. Themes of display also included results from Ocean Drilling and International Continental Drilling Programmes. Many countries presented maps of their natural resources, geological features, etc. as well as their major earth science projects in the stalls. Computer-aided programs, newsletters, information booklets and other handouts helped visitors to browse.

The Indian booth featured maps and booklets that reflected the status of earth sciences in India. It also displayed select publications from the Geological Society of India. Also in circulation was the publication by the Indian National Science Academy on earth science research in India (*Glimpses of Geoscientific Research in India – The Indian Report to IUGS, 1999–2004*). India was one of the contenders for the 2012 IGC, along with Morocco and Australia; the National Geophysical Research Institute, Hyderabad coordinated these efforts. Although the bid was lost to Australia (the 2012 IGC is to take place in Brisbane), the effort to project Indian earth sciences to a global audience was not entirely unsuccessful, as evident from the response of visitors to the booth and interest in the earth sciences programmes in India.

A major trend in earth sciences research is that most major programmes, be it the ocean/continental drilling programme or preservation of environment, are done through international participation. It must be admitted that India has not taken any major initiatives in international earth sciences collaboration. Partnership with neighbouring countries such as Pakistan, Nepal, Bangladesh, Bhutan and Sri Lanka would certainly help in advancing earth science research in the whole of Asia in general and India in particular. Such efforts would help develop a larger community with common goals and interests that would also lead to building better partnership in endeavours such as hosting a future IGC (a case in point is that although the next IGC is going to be held in Oslo, Norway, it was termed collectively as a Nordic initiative). The experience at Florence hope-

fully, will equip the Indian earth sciences community to prepare for a successful bid for IGC 2016 (coinciding with a generational change).

Many of the research papers (about 50 delegates) from India reported results of programmes on seismicity and tectonics as well as crustal and mantle structure, developments in geochemistry, evolution of tectonic belts, etc. Indian initiatives also included a couple of sessions on stable shield seismicity, Himalayan tectonics and geological education. However, the fields in which major researches are based on international partnership – the ocean/continental drilling programme and related efforts, global climatic changes, sedimentary processes and stratigraphic sequencing, to mention a few, – participation from India was significantly missing. Exciting developments are taking place in the fields of planetary sciences, continental deformation and dynamics, ocean sciences and space-based geodesy. With a variety of geologic settings, starting from the oldest cratons to the ancient rift systems, continental collision zones and younger fault systems, India and its contiguous areas offer one of the most dynamic and vibrant regions to an earth scientist. While we may have made some isolated advances based on individual performances in some areas, much remains to be done to convince the world on the prowess of our scientific research. Whether we like it or not, international science has become highly competitive, and India does not seem to be doing well (here I compare ourselves with China). Delusion about our grandeur might help us with self-serving excuses for our performance, but that will not take us far. Besides implementing measures (well known and much publicized in *Current Science*) to strengthen research activities on a war-footing basis, there also has to be a much more coordinated effort from all concerned, to sponsor and present the best research outputs from India in such international fora. It is worthwhile to quote from a recent editorial in *Current Science*, 'Our abilities to identify potential champions and nurture them seem limited in both sport and science' – a comparison with our performance in the Athens Olympics may strike an illuminating note.

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