

Birbal Sahni Institute of Palaeosciences
Monthly summary on Research Activities
(October, 2022)

1. Areas of Focus:

The institute carries out research on fundamental as well as applied aspects of Palaeosciences that includes Evolutionary history of biota, Paleoclimate, studies of past civilization, Human history and contemporary Climate Change issues, following an integrated and multi-disciplinary approach.

Key research activities under following objectives:

- Understanding origin and evolution of life through time and space.
- Understanding climate change in recent and deep geological times.
- Understanding past civilization and human history.
- Application of Palaeosciences in exploration of fossil fuel and coal industry.

2. Important Highlights of Major Research Programmes

a. Key Scientific Findings of the Month (October 2022)

1. Past (Middle Holocene), current and future (2050, 2070) distribution of two dominant mangrove species (*Rhizophora apiculata*, *Avicennia officinalis*) in Indian coastal wetlands was projected through an ensemble of eight algorithms using species distribution modeling approach. Total mangrove habitat in current and future climatic scenarios decreased in 2050 and 2070 which indicates the vulnerability of the species to climate change impacts. Mangrove species are projected to shift their ranges more towards land in future experiencing a decrease in the amount of suitable coastal area available to them throughout the Indian coastline. Our findings will assist in formulating species-specific restoration plans for these keystone species in context of climate change in the Indian Subcontinent (Samal et al 2022).
2. The study related to the maternal ancestry of Nepal populations is the first such study where researchers have analysed the mitochondrial DNA sequence of 999 individuals from different ethnic groups of Nepal, including Newar, Magar, Sherpa, Brahmin, Tharu, Tamang, and populations from Kathmandu and Eastern Nepal. It found that most Nepali populations have derived their maternal ancestry from the lowland populations than the highlanders. The results obtained from this study helped the researchers in filling several important gaps about the history and past demographic events that shaped the present Nepalese genetic diversity and the carriers of some

mitochondrial lineages may have crossed the Himalayas into Nepal, most likely via Southeast Tibet, between 3.8 and 6 thousand years ago (Basnet et al . 2022).

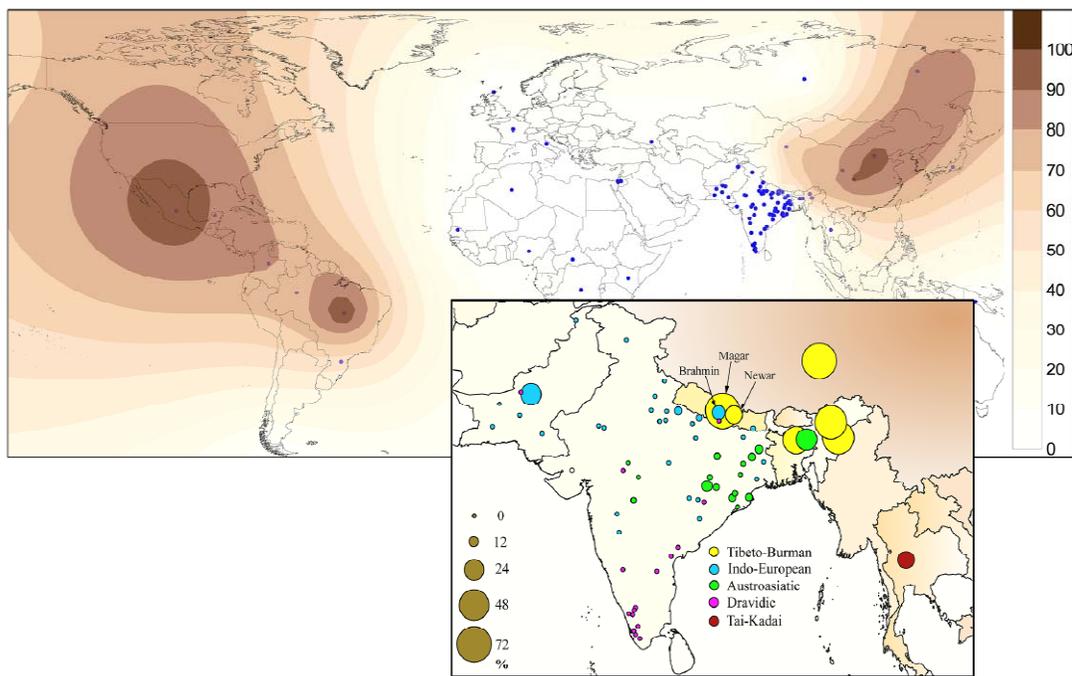


Fig.3 *EDAR* 1540C allele frequency distribution. **A** Geographic distribution of the *EDAR* 1540C allele frequency worldwide. The Map was generated using the Kriging linear model of Surfer 16.0.3 (Golden Software, LLC). **B** Geographic distribution of the *EDAR* 1540C allele frequency in different groups of Asia. The frequency is shown in proportion to the bubble size

3. Third Palaeobotanical Society Invited Lecture (September 26, 2022)

Third Palaeobotanical Society Invited Lecture was delivered by Dr. ArtiGarg, Scientist-E & Head of Office, Botanical Survey of India, Central Regional Centre, Allahabad, Uttar Pradesh, India on 26th September 2022(Online).The title of the lecture was “Herbarium techniques and digitization”.Dr. Vandana Prasad, Director, BSIP & President of the Society was the Chief Guest for programme. Members of the Palaeobotanical Society and staff members of BSIP including Research Associates, Research Scholars and Project Staff attended the lecture.

4. Special Campaign on Cleanliness (DST) October 2- October 31, 2022

BSIP officials have participated in a Special Campaign on Cleanliness by DST and are regularly monitoring and cleaning of laboratories/ lavatory and plantation in the Institute premises and are also keeping a record of the work done through photographs (after and before) of each place.

List of research publications (October, 2022):

1. **Masood, K., Manoj M.C.,** Weber, M.E. (2022). Reconstructing dynamics of northern and southern sourced bottom waters during the last 200 ka using sortable silt records in the lower Bengal Fan. *Zeitschrift der Deutschen Gesellschaft für Geowissenschaften*. DOI:10.1127/zdgg/2022/0318(**Impact factor: 1.167**).
2. **Kumar, K., Sharma, A.,** Srivastava, P., **Thakur, B.** (2022). Implications for catchment weathering, provenance, and climatic records from a late Pleistocene to present sedimentary sequence in Gujarat, India. *Quaternary Research*. DOI: :10.1017/qua.2022.39. (**Impact factor: 2.797**).
3. Samal, P., **Srivastava, J.,** Singarasubramanian, S.R., **Saraf, P.N.,** Charles, B. (2022). Ensemble modeling approach to predict the past and future climate suitability for two mangrove species along the coastal wetlands of peninsular India. *Ecological Informatics*. DOI:10.1016/j.ecoinf.2022.101819. (**Impact factor: 4.498**).
4. **Verma, S., Phartiyal, B.,** Chandra, R. (2022). Geoheritage Sites of Quaternary Loess–Palaeosol and Palaeo-fluvio-lacustrine Deposits in Northwest Himalaya: a Necessitate Protection. *Geoheritage*. DOI:10.1007/s12371-022-00743-3. (**Impact factor: 2.786**).
5. Basnet, R., **Rai, N.,** Tamang, R., Awasthi, N.P., Pradhan, I., Parajuli, P., Kashyap, D., Reddy, A.G., Chaubey, G., Manandhar, K.D., Shrestha, T.R., Thangaraj, K. (2022). The matrilineal ancestry of Nepali populations. *Human Genetics*. DOI:10.1007/s00439-022-02488-z. (**Impact factor: 5.881**).
6. **Shabbar, H., Saxena, A.,** Tinn, O., **Gupta, S.,** Singh, K.J. (2022). Non-calcified warm-water marine macroalgae from the Ordovician strata of Spiti, Tethys Himalaya, India. *Palaeoworld*. DOI:10.1016/j.palwor.2022.09.004(**Impact factor: 2.717**).
7. **Shekhar, M.,** Singh, M., Singh, S., Bhardwaj A., Dhyani R., **Ranhotra, P.S.,** Sam, L., **Bhattacharya, A.,** (2022). Rising winter temperatures might augment increasing wheat yield in Gangetic Plains. *Theoretical and Applied Climatology*. <https://doi.org/10.1007/s00704-022-04246-7>.

Photographs showing important highlights of major programs/research activities organized during October, 2022:

