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Abstract Topic:- Evolutionary and population genetics

Abstract Title:- Unlocking the genetic history of Vadnagar archaeological complex using paleogenomics

Presenting author name :- Bhavna Ahlawat

Presenting author institute:- Panjab University, Chandigarh and DST- Birbal Sahni Institute of Palaeosciences, Lucknow

Co-authors name:- Lomous Kumar, Abhijit Ambekar, Jagmahender Singh Sehrawat, Niraj Rai

Co-authors institute:-DST- Birbal Sahni Institute of Palaeosciences, Lucknow, Archaeological Survey of India, Delhi, Panjab University, Chandigarh

Aims:-Vadnagar stands as a prominent archaeological site in India and has held prestigious status through five prestigious dynasties of Gujarat during ancient and medieval times. The town of Vadnagar is located in the Mehsana district of Gujarat, India, a strategic location that has been the intersection of ancient important trade routes. The location of the town makes it a culturally rich heritage site. The Vadnagar archaeological complex includes Vadnagar, Taranga, Anaj Godown, Kota Ambaji Lake and Sharmistha Lake as major archaeological sites. This study focuses on exploring the genetic ancestry of the Vadnagar locality in Gujarat and investigates any possible migratory pattern in the area through excavated skeletal remains and archaeological evidence. The study uses the modern high-throughput sequencing technology that revolutionized the fields of anthropology, and genetics through the analysis of ancient DNA. This research will address the challenges, advancements, and invaluable results that have emerged from the genetic history of the Vadnagar archaeological site, shedding light on the rich tapestry of human history in this vibrant and multifaceted region.

Methods:- To investigate the population history of Vadnagar on a finer scale, we conducted a mitochondrial DNA study on the excavated skeletal remains alongside the contemporary Indian populations from populations around the Indian subcontinent.

Results:- The results show that the Ancient DNA analyses of skeletal remains (N=4), using PCA and ADMIXTURE analysis indicate that the genetic affinities of the skeletal remains are local along with some visible migration.

Conclusions:- The skeletal samples from the archaeological site of Kota Ambaji Lake and Sharmistha Lake point towards local genetic ancestry, whereas the presence of relics excavated from the votive stupa at Taranga monastery points towards the growth of Hinayana Buddhism around the 4th century CE and the cosmopolitan nature of Vadnagar and its importance as a major melting pot of cultural exchange during the ancient times.

Keywords:- Ancient DNA, Mitochondrial DNA, Genomics, Migration, Buddhism