

# Analysis of Postcranial Remains from Sanjan, Valsad District, Gujarat State, India

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## INTRODUCTION

The site of Sanjan is believed to be one of the earliest places on the Indian subcontinent where the Zoroastrian Parsis settled after fleeing from Persia (present day Iran) due to Islamic persecution. This site represents a city that existed between the 8th and 13th centuries A.D. and has yielded a large amount of osteological remains dating to the 15th century A.D. Sanjan was discovered in the year 2002. The excavations of the first two years (2002, 2003) established the contact of Sanjan with West Asia and Iran but did not provide any specifically Zoroastrian evidence to establish the ethnicity of the population. Excavations carried out in 2004 revealed a mortuary structure which typifies a Parsi settlement. This structure, known as the *Dakhma* or the Tower of Silence, was an absolute proof of the existence of a large Parsi population at this site.

In 2004, 40% of the mortuary site of Sanjan was excavated indicating the presence of skeletal remains of approximately 140 individuals. Since the osteological material recovered from this excavation is disarticulated and commingled, analyses of the cranial, dental and postcranial remains were carried out independently by Dutt, Bhattacharya and Pitale respectively. The sample studied during the course of this research comprises of approximately 12% of the total collection. The purpose was to determine whether these Sanjan remains have traits consistent with those known to characterize contemporary Zoroastrians Parsis in India.



Sanjan Bhandar, facing North. Courtesy: Dr. Khurush Dalal



Map of India from www.mapsofindia.com



Map showing the location of Sanjan in Valsad District, Gujarat. Modified from: S.P. Gupta et al 2004



Dead Bodies exposed on the Pavi in a modern day Parsi Dakhma <http://www.ronlaytner.com/towerofsilence.html>



Vultures at a modern day Parsi Dakhma <http://www.ronlaytner.com/towerofsilence.html>



Indian Wild Boar (*Sus scrofa*) [http://www.wildlifetimes.com/gallery/albums/userpics/10003/boar\\_rubbing.jpg](http://www.wildlifetimes.com/gallery/albums/userpics/10003/boar_rubbing.jpg)

## MATERIAL AND METHODS

- 386 Postcranial Bones. Roughly 12% of the entire excavated collection.
- Disarticulated skeletal remains with no discernable organization.
- Skeletal remains include newborns, sub-adults, adolescents, adults and elderly individuals.
- Glass beads, metal ornaments and pot-sherds recovered along with human remains.
- Bones are fragmented and the fragment sizes differ widely.
- High prevalence of long bones in the sample due to their better preservation.
- Pathological and taphonomic changes were observed and recorded.
- All bones with pathological lesions were radiographed.
- Collection curated at Deccan College (Deemed University), Pune, India.
- Stature Estimation carried out on long bones (Buikstra and Ubelaker 1994).

## RESULTS

- MNI Count: 36 (Left Femur).
- Taphonomic changes observed on 6 femora (Soil pH value is 6 = slightly acidic soil).
- Five bones show lesions resulting from non-specific infections.
- Two bones show the presence of neoplastic growths and tumors.
- One femur indicates the presence of osteopenia (probable osteoporosis).

## TAPHONOMIC CHANGES

Six femora show extensive wear due to taphonomic changes. Five out of these six femora indicate wear occurring as a result of water logging or presence of extensive vegetation. The 6th femur (L17) possesses a groove on the lateral aspect of the distal shaft, likely evidence of post mortem scavenging by the Indian wild boar (*Sus scrofa*). This finding suggests that such animals held access to the skeletal remains unlike current *dakhmas*.



Femur L17 interfaced with *Sus scrofa* canine.

## PATHOLOGICAL OBSERVATIONS

- Osteomyelitis (n = 3)
- Periostitis (n = 2)
- Exostosis or Cancellous Osteoma (n = 1)
- Osteoid Osteoma (n = 1)
- Osteopenia (probable Osteoporosis) (n = 1)



Radius R2: Periostitis



Fibula UI 11: Periostitis



Femur LS: Osteopenia (probably Osteoporosis).



Femur L17: Osteoid Osteoma



Tibia R2: Osteomyelitis



Femur L2: Exostosis or Cancellous Osteoma

Analysis of the postcrania has revealed that by and large the populace at Sanjan was healthy and well-nourished. The analysis of cranial remains by Dutt (2006) has yielded the same result. However, the dental remains studied by Bhattacharya (2006) have yielded an immense number of pathologies.

Modern day Parsis have a high incidence of Osteoporosis. Be that as it may, only 1 of 386 postcranial bones that have been studied was found to show evidence of Osteopenia (probable Osteoporosis). Based on this evidence we can surmise that the Parsis at Sanjan were probably not as afflicted by this disorder as modern day Parsis.

## LIMITATIONS AND SIGNIFICANCE

The nature of fractured, commingled remains pose a challenge. However, through this study we are able to gain an insight into the health of ancient Zoroastrians that reveal differences than within modern Parsis.

Present day Zoroastrians (Parsis) in India are an extremely influential community, socially and economically, as well as politically. This community is today extremely endogamous but in the past there has been gene flow between the Parsis and other local western Indian local populations. Further study of skeletal remains from Sanjan will aid us in understanding how the Parsis have adapted to the Indian subcontinent since their migration to India almost 1300 years ago.

## OPPORTUNITIES FOR FUTURE RESEARCH

- Rest of the Sanjan *dakhma* needs to be excavated so that an in-depth and extensive analysis of the skeletal remains can be carried out.
- Comparative analysis of pathological lesions observed by Pitale, Dutt and Bhattacharya with the pathologies prevalent among present day Parsis is essential.
- It is also necessary to carry out a comparative analysis of remains from Sanjan *dakhma* and other contemporary *dakhmas* in India when they are excavated in the future.

## Bibliography:

- Pitale, G 2006 Post-Cranial Skeletal Collection from Sanjan: A Bioanthropological and Taphonomic Approach (M.A. Thesis, Deccan College, India)
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- Bhattacharya, S 2006 Investigation in Dental Anthropology: A Case Study For The Medieval Sanjan (M.A. Thesis, Deccan College, India)

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