

Executive Summary of the Thesis

**Prehistoric Archaeology of the Gundlakamma and Adjoining River Basins,
Prakasam District, Andhra Pradesh**

**A Thesis submitted to
The Maharaja Sayajirao University of Baroda
for the award of the Degree of
Doctor of Philosophy in Archaeology**

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THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA
VADODARA, GUJARAT
APRIL 2023**

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EXECUTIVE SUMMARY

The thesis entitled “Prehistoric Archaeology of the Gundlakamma and Adjoining river basins, Prakasam District, Andhra Pradesh” focused on reconstructing the Palaeolithic cultural sequence of the Gundlakamma and adjoining river basins using multidisciplinary methods. South Asia, with its rich Palaeolithic remains, occupies an important place in human evolutionary studies. However, the region attracts little attention in global discussions on human biological and cultural evolution due to the lack of a firm chronological framework, high-resolution lithic analysis, and reliable palaeoenvironmental reconstructions. This study aims to establish a credible chronological framework and the environmental context of Palaeolithic cultural development in the Gundlakamma and adjoining river basins of the Prakasam District, Andhra Pradesh. Previous sporadic studies from the mid-1860s onwards have highlighted the region's archaeological potential by identifying rich Palaeolithic remains, animal fossils, and their unique geological associations (e.g., Youngest Toba Tuff deposits, inland sand dunes). The current research uses multidisciplinary methods that include excavations, chronometric age estimations (Luminescence and U series), high-resolution lithic technology studies, and geoarchaeology to examine the region's extensive prehistoric remains.

Intensive surveys were conducted in the study region to locate stratified palaeolithic sites, followed by a systematic investigation of seven sites representing a broad temporal range including the Middle and Late Pleistocene epochs. The current research marks the first attempt to use chronometric dating methods to reconstruct a regional Palaeolithic cultural sequence and to use the new data to address general issues in regional Palaeolithic studies in peninsular India. The explorations undertaken in the region under investigation led to the discovery of 68 Palaeolithic sites associated with different geological and cultural contexts. These sites represent different phases of the Palaeolithic culture including Lower, Middle and post-Middle. In addition, sites with Youngest Toba Tuff (YTT) deposits from the 74 ka Toba super-eruption were identified in the region. The Middle Palaeolithic cultural remains constitute the most dominant amongst the diverse cultural assemblages and represent a broad temporal range from ~247 to 59 ka. Sites showing post-Middle Palaeolithic cultural remains are the second dominant category and are mostly concentrated along the upper reaches of the Gundlakamma and Manneru river basins. The Lower Palaeolithic sites are mostly known from findspots and riverbeds with a small number of stratified localities. This could be due to the lesser exposure of Lower Palaeolithic horizons, which are associated with hard and compact sediments that are buried deeply under Late Pleistocene sediments.

The late Acheulian/early Middle Palaeolithic transitional assemblages in the region are unique to understand the emergence of prepared core technologies. The study of these transitional assemblages produced important datasets that contributed to the emerging framework of the origin of prepared core technologies, both at regional and global level. These assemblages show a combination of both bifacial and prepared core technologies, with a greater preference for the latter. Following on from these transitional industries, typical Middle Palaeolithic assemblages appear in the region as early as 247 ka and last until 59 ka, showing temporal variations in the Levallois technology and other artefact types. The Middle Palaeolithic record of the region is extensive and widely spread across the region. The temporal variations allow the Middle Palaeolithic to be divided into two phases: an early (between MIS 7-6 and 5e) phase and a late (post-MIS 5a/post-last interglacial) phase. The post-MIS 5a Middle Palaeolithic technology continues to exist up to the beginning of MIS 3. Blade based assemblages dominate the MIS 3, postdating the Middle Palaeolithic technology, and existed from 41 to 29 ka. The MIS 3 blade based assemblages are stratigraphically different from those belonging to MIS 5a and MIS 4. This, currently under-researched record, hints at significant insights that could be gleaned from it, such as changes in local environment, technological advancements, and subsistence strategies. It also holds enormous potential for addressing broader issues of cultural change in the region.

The Palaeolithic record of Gundlakamma and adjoining river basins adds significant contributions to establishing a credible chronological framework as well as understanding hominin behavioural evolution in South Asia, and it helps fill up major gaps in our knowledge of the same.

Chapter 1 Introduction

This chapter presents how the current research draw inspiration from existing scholarship in prehistoric archaeology and other associated disciplines. It also discusses why the topic is important to the discipline, the gap in knowledge and the need to generate more systematic data. The chapter reviews previous work done on this topic, by citing relevant literature and also includes an overview of the objectives of the present work. The South Asian Palaeolithic record is complex and very diverse particularly during the Late Pleistocene epoch. Recent studies (Akhilesh et al 2018; Petraglia et al 2007; Mishra et al 2013) have highlighted the same and called for reevaluation of the few concepts in South Asian Palaeolithic studies. The current status of few such concepts such as Late Acheulian to Middle Palaeolithic transitions,

Youngest Toba Tuff deposits in South Asia as a Late Pleistocene chronological marker, and initial Modern Human colonisation of South Asia, and the nature of Post Middle Palaeolithic cultural developments were summarised in the chapter.

Chapter 2 Study Area: Physiographic and Cultural Setting

This chapter gives an introduction to the physiographic setting of the region followed by cultural framework of the region. The geological history of the region was described with appropriate illustrations followed by the geomorphological setting in which Prehistoric sites are found. The drainage network of the Gundlakamma and adjoining river basins was discussed in this chapter along with the previous work on the Prehistory of the region.

Chapter 3: Research Methods

This chapter outlines the field and laboratory techniques used in this study. It focuses on survey methods, excavations, section scraping and step-trenching strategies, sample preparation and technical procedures used in this thesis rather than providing a detailed treatment of the principles behind each technique as they are long-established methods. The chapter elaborates the survey strategies such as the the reading of the topographic sheets, satellite images; Optically Stimulated Luminescence and U series dating techniques to date the sediments; Geochemical analysis of Volcanic ash; Particle size analysis and mineral magnetic studies and the methods used lithic artefact and faunal analysis. It further includes the classification of the data and methods exercised in analysing the data recovered using multiple methods.

Chapter 4: Results

A total number of 61 new Palaeolithic sites have been reported during the explorations. Based on the extent of sites, the freshness of the artefacts, and the presence of debitage (< 2 cm) and hammerstones, most of the sites are of primary context. It is observed that a maximum of the sites located in badland areas were exposed due to rill and sheet erosion. Among 61 sites, 33 are from the upper Paleru basin, 27 are from the upper Gundlakamma basin, and two are from the upper Manneru basin. A few microlithic sites are also reported from the Upper Paleru basin, which was unknown previously. Microliths were found in association with the inland dune deposits. Site distribution patterns and the composite stratigraphy were discussed in this chapter.

To reconstruct the Prehistoric cultural sequence of the Gundlakamma and adjoining river basins, seven newly reported sites were investigated in detail. The sites were selected based on the

criteria of having rich cultural material from in situ contexts and assuming they can provide material from oldest to youngest time ranges. These sites are Vemulapadu (VMP), A. Agrapharam (AAH), Nandanavanam (NNV), Hanumanthunipadu (HMP), Retlapalle (RTP), Motravulapadu and Ardhavedu (AVD). Excavations, section scrapings and step trenches were conducted at these sites to recover sediment samples for Luminescence dating and cultural material. For each of these seven sites Stratigraphy, Luminescence Chronology, Lithic technology was discussed in this chapter.

Chapter 5: Discussion

This chapter discusses the results of the analysis and interpretation of data presented in the preceding chapters. The themes discussed here include the Palaeolithic cultural sequence of the studied region by situating the same within South Asia; the origin and evolution of Middle Palaeolithic technologies in South Asia; the Youngest Toba Tuff beds as a Late Pleistocene chronological marker; the initial Modern human colonization of South Asia; post-Middle Palaeolithic cultural developments in South Asia; the nature of lithic assemblages before and after the Toba eruption; and Archaic – Modern human interactions in South Asia.

The research was aimed at generating a robust chronological framework for the Palaeolithic cultures in the region under investigation along with high resolution lithic analysis. At the beginning of the research, after going through the available literature, it was identified that the lack of chronometric ages for the South Asian Palaeolithic studies limits our understanding of human cultural evolution on both the global and regional level. Therefore, the primary focus of the current research was to obtain chronometric ages for the Palaeolithic remains in the region. Secondly, more emphasis was placed on understanding lithic artefacts from an assemblage perspective to better appreciate the technology rather than mere descriptions of artefacts. Geoarchaeological analysis were limited to specific cases (e.g. YTT deposits) where ever it was necessary. The researcher was able to report 61 new Palaeolithic sites, however, only seven sites were studied intensely for analytical purpose. The research recognises that focusing on a few sites by excavating and step trenching will result in more robust chronology and secure context for the artefacts than studying surface collections from many sites. Even though this research also incorporated surface collected artefacts, specific caution was taken while selecting sites for the study of surface collections. These included selecting sites with single artefact/cultural horizon, which was further ascertained through small scale excavations and step trenching. Further, the methodological approach also included limiting surface

collections by laying out systematic grids to exclude the possibility of biased random collections. The seven sites on which the research focused upon were selected as they represented a wide temporal range, resulting from sites distributed across the Gundlakamma and adjoining river basins.

Chapter 6: Conclusion

The said chapter presented the findings of multidisciplinary studies undertaken along the Gundlakamma and adjoining valleys with the goal of situating the region within the context of peninsular India's Palaeolithic archaeology and the global context. The study highlights the region's potential for understanding hominin behavioural evolution in regional and global contexts. The South Asian Palaeolithic record was thought to lack significant evidence in hominin evolutionary studies, mainly due to the absence of hominin fossil records, a robust chronological framework, and associated paleoenvironmental reconstructions. However, more recent studies by Petraglia et al. (2007), Pappu et al. (2010), Mishra et al. (2013), and Akhilesh et al. (2018) have highlighted the significance of South Asia in human evolutionary studies. Following on from these studies, the current research explores the crucial role of the South Asian Palaeolithic record in understanding human behavioural evolution. Further, the study emphasises the complexity of the region's Palaeolithic record, which challenges and calls for a re-evaluation of the region's current human evolutionary framework. The research focused more on generating chronometric ages for the palaeolithic remains recovered from secure geological contexts, which are crucial in addressing general issues in South Asian Palaeolithic studies.

Key Findings

The Palaeolithic record of Gundlakamma and adjoining river basins adds significant contributions in understanding the hominin behavioural evolution in South Asia and fills major gaps in our knowledge of the same. Intensive surveys were conducted in the study region to locate stratified palaeolithic sites, followed by a systematic investigation of seven sites representing a broad temporal range including the Middle and Late Pleistocene. The current research marks the first attempt to use chronometric dating methods to reconstruct a regional Palaeolithic cultural sequence and to use the new data to address general issues in regional Palaeolithic studies in peninsular India. Multidisciplinary approaches involving excavations, luminescence chronology, U-series dating, geoarchaeology, geochemistry and faunal analysis were adopted in the current research to situate the Palaeolithic record of the region under

investigation in the broader regional and global context. Further, the high-resolution lithic analysis combined with statistical analyses of various attributes of lithic artefacts were conducted in this research. The lithic analysis, coupled with chronometric ages, offered significant insights into understanding the variations and similarities of the lithic technology through time.

The explorations undertaken in the region under investigation led to the discovery of 68 Palaeolithic sites associated with different geological and cultural contexts. These sites represent different phases of the Palaeolithic culture including Lower, Middle and post-Middle. In addition, sites with Youngest Toba Tuff (YTT) deposits from the 74 ka Toba super-eruption were identified in the region. The Middle Palaeolithic cultural remains constitute the most dominant amongst the diverse cultural assemblages and represent a broad temporal range from ~247 to 59 ka.

Recommendations/Suggestions

The current research focuses on seven temporally and spatially distinct Palaeolithic sites by approaching them with multidisciplinary methods including excavations, Luminescence and U-series chronology, geoarchaeology, geochemistry, and Palaeontology. These sites were selected based on their rich artefact presence, good preservation and expected to represent broad temporal range to build the cultural sequence of the study region. The study recognises the biases towards selecting these sites and potentially overlooks the spatial variation of the sites. To increase the artefact sample size, systematic grid collections were conducted from six sites which may influence the overall composition of the assemblage and frequencies of artefact types. However, these sites contain single techno-cultural artefact bearing horizons that potentially excludes the temporal mixing of the artefacts and eliminates the sites being palimpsest. The Luminescence method was unable to date the older sediments due to the signal saturation in feldspar and quartz grains.

The current research stresses the need for further investigation of these sites aimed at large scale excavations, other chronometric methods to date older sediments which can add significant insights into the South Asian Palaeolithic record. Paleoenvironmental reconstructions using sediments associated with artefacts and faunal remains are further needed to assess the role of climate in shaping the hominin behavioural evolution. As the region presents unique situations such as the presence of YTT deposits, Acheulian to Middle Palaeolithic transitional sites, and Palaeolithic assemblages spanning crucial events of climate

change, paleoenvironmental reconstructions can provide important information on human cultural and past environmental relations in a broader perspective. Further investigating the microlithic/Mesolithic assemblages associated with inland sand dunes in Paleru valley and other sediments in Gundlakamma and Manneru valley can provide significant insights on the post 30 ka cultural developments in the region.

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