

Walking with the Unicorn

Social Organization and Material Culture
in Ancient South Asia

Jonathan Mark Kenoyer
Felicitation Volume

Edited by

Dennys Frenez, Gregg M. Jamison, Randall W. Law,
Massimo Vidale and Richard H. Meadow



ARCHAEOPRESS PUBLISHING LTD
Summertown Pavilion
18-24 Middle Way
Summertown
Oxford OX2 7LG

www.archaeopress.com

ISBN 978 1 78491 917 7
ISBN 978 1 78491 918 4 (e-Pdf)

© ISMEO - Associazione Internazionale di Studi sul Mediterraneo e l'Oriente, Archaeopress and the authors 2018

Front cover: SEM microphotograph of Indus unicorn seal H95-2491 from Harappa (photograph by J. Mark Kenoyer © Harappa Archaeological Research Project).

Back cover, background: Pot from the Cemetery H Culture levels of Harappa with a hoard of beads and decorative objects (photograph by Toshihiko Kakima © Prof. Hideo Kondo and NHK promotions).

Back cover, box: Jonathan Mark Kenoyer excavating a unicorn seal found at Harappa (© Harappa Archaeological Research Project).



ISMEO - Associazione Internazionale
di Studi sul Mediterraneo e l'Oriente
Corso Vittorio Emanuele II, 244
Palazzo Baleani
Roma, RM 00186

www.ismeo.eu

Serie Orientale Roma, 15

This volume was published with the financial assistance of a grant from the Progetto MIUR 'Studi e ricerche sulle culture dell'Asia e dell'Africa: tradizione e continuità, rivitalizzazione e divulgazione'

All rights reserved. No part of this book may be reproduced, or transmitted, in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of the copyright owners.

Printed in England by The Holywell Press, Oxford

This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

Jonathan Mark Kenoyer and ISMEO – Occasions in Continuumv Adriano V. Rossi	v
Jonathan Mark Kenoyer – The Tale of Sikander and the Unicorn ix Dennys Frenez, Gregg Jamison, Randall Law, Massimo Vidale and Richard H. Meadow	ix
Jonathan Mark Kenoyer – Bibliography xi	xi
Fish Exploitation during the Harappan Period at Bagasra in Gujarat, India. An Ichthyoarchaeological Approach1 Abhayan G. S., P. P. Joglekar, P. Ajithprasad, K. Krishnan, K. K. Bhan and S. V. Rajesh	1
The Sincerest Form of Flattery? Terracotta Seals as Evidence of Imitation and Agency in Bronze Age Middle Asia19 Marta Ameri	19
Reflections on Fantastic Beasts of the Harappan World. A View from the West26 Joan Aruz	26
Fish Symbolism and Fish Remains in Ancient South Asia33 William R. Belcher	33
Some Important Aspects of Technology and Craft Production in the Indus Civilization with Specific Reference to Gujarat48 Kuldeep K. Bhan	48
Chert Mines and Chert Miners. The Material Culture and Social Organization of the Indus Chipped Stone Workers, Artisans and Traders in the Indus Valley (Sindh, Pakistan)68 Paolo Biagi, Elisabetta Starnini and Ryszard Michniak	68
Ceramic Analysis and the Indus Civilization. A Review90 Alessandro Ceccarelli and Cameron A. Petrie	90
Family Matters in Harappan Gujarat104 Brad Chase	104
Revisiting the Ornament Styles of the Indus Figurines: Evidence from Harappa, Pakistan120 Sharri R. Clark	120
The Harappan ‘Veneer’ and the Forging of Urban Identity150 Mary A. Davis	150
Private Person or Public Persona? Use and Significance of Standard Indus Seals as Markers of Formal Socio-Economic Identities166 Dennys Frenez	166
Lithic Blade Implements and their Role in the Harappan Chalcolithic Cultural Development in Gujarat ...194 Charusmita Gadekar and P. Ajithprasad	194
Who Were the ‘Massacre Victims’ at Mohenjo-daro? A Craniometric Investigation210 Brian E. Hemphill	210
Indus Copper and Bronze: Traditional Perspectives and New Interpretations251 Brett C. Hoffman	251
A Short Note on Strontium Isotope Analysis of Human Skeletal Remains from the Site of Sarai Khola265 Asma Ibrahim	265
The Organization of Indus Unicorn Seal Production. A Multi-faceted Investigation of Technology, Skill, and Style272 Gregg M. Jamison	272

The Size of Indus Seals and its Significance	292
Ayumu Konasukawa and Manabu Koiso	
The Art and Technology of Reserving a Slip. A Complex Side of Indus Ceramic Tradition	318
K. Krishnan and Sneh Pravinkumar Patel	
The Art of the Harappan Microbead – Revisited	327
Randall W. Law	
The North Gujarat Archaeological Project – NoGAP. A Multi-Proxy and Multi-Scale Study of Long-Term Socio-Ecological Dynamics	343
Marco Madella, P. Ajithprasad, Carla Lancelotti, J. J. García-Granero, F. C. Conesa, C. Gadekar and S. V. Rajesh	
Toponyms, Directions and Tribal Names in the Indus Script	359
Iravatham Mahadevan and M. V. Bhaskar	
Ganweriwala – A New Perspective	377
Farzand Masih	
Personal Reflections on some Contributions of Jonathan Mark Kenoyer to the Archaeology of Northwestern South Asia	384
Richard H. Meadow	
Invisible Value or Tactile Value? Steatite in the Faience Complexes of the Indus Valley Tradition	389
Heather M.-L. Miller and Jonathan Mark Kenoyer	
What Makes a Pot Harappan?	395
Heidi J. Miller	
Dilmun-Meluhhan Relations Revisited in Light of Observations on Early Dilmun Seal Production during the City IIa-c Period (c. 2050-1800 BC)	406
Eric Olijdam and H��l��ne David-Cuny	
Unicorn Bull and Victory Parade	433
Asko Parpola	
Analytical Study of Harappan Copper Artifacts from Gujarat with Special Reference to Bagasra	443
Ambika Patel and P. Ajithprasad	
Looking beneath the Veneer. Thoughts about Environmental and Cultural Diversity in the Indus Civilization	453
Cameron A. Petrie, Danika Parikh, Adam S. Green and Jennifer Bates	
Decorated Carnelian Beads from the Indus Civilization Site of Dholavira (Great Rann of Kachchha, Gujarat)	475
V. N. Prabhakar	
Artifact Reuse and Mixed Archaeological Contexts at Chatrikhera, Rajasthan	486
Teresa P. Raczek, Namita S. Sugandhi, Prabodh Shirvalkar and Lalit Pandey	
Pre-Prabhas Assemblage in Gujarat. An Assessment based on the Material Culture from Somnath, Datrana and Janan	495
Rajesh S. V., Charusmita Gadekar, P. Ajithprasad, G. S. Abhayan, K. Krishnan and Marco Madella	
The Indus Script and Economics. A Role for Indus Seals and Tablets in Rationing and Administration of Labor	518
Rajesh P. N. Rao	
Beads of Possible Indus Origin with Sumerian Royal Inscriptions	526
Julian E. Reade and Jonathan Taylor	
The Role of Archaeology in National Identity: Muslim Archaeology in Pakistan	530
Shakirullah	
The Smallest Scale of Stone. Pebbles as a Diminutive Form of Nature	536
Monica L. Smith	
Five Thousand Years of Shell Exploitation at Bandar Jissah, Sultanate of Oman	547
Christopher P. Thornton, Charlotte M. Cable, David Bosch and Leslie Bosch	

Indus Stone Beads in the Ghaggar Plain with a Focus on the Evidence from Farmana and Mitathal.....	568
Akinori Uesugi, Manmohan Kumar and Vivek Dangi	
Locard’s Exchange Principle and the Bead-Making Industries of the 3rd Millennium BC.....	592
Massimo Vidale, Giuseppe Guida, Gianfranco Priori and Anna Siviero	
Inscription Carving Technology of Early Historic South Asia. Results of Experimental Archaeology and Assessment of Minor Rock Edicts in Karnataka.....	605
Heather Walder	
The Volumetric System of Harappa.....	623
Bryan K. Wells	
An Harappan History of US Researchers in Pakistan. In Celebration of Jonathan Mark Kenoyer	628
Rita P. Wright	
Editors	636
Authors Contacts.....	637

Decorated Carnelian Beads from the Indus Civilization Site of Dholavira (Great Rann of Kachchha, Gujarat)

V. N. Prabhakar

Dholavira, district Kachchh, Gujarat was excavated by Archaeological Survey of India (ASI) for thirteen field seasons between 1989-90 and 2004-05. The excavations have brought to light several facets of cultural evolution, peak and devolution of Harappan Civilization which is represented in the form of ceramics, architecture, craftsmanship, industrial activities, trade and commerce, etc. Among the material remains unearthed from the site, prominent is the evidence of a diversity of bead remains, several thousands in number. The presence of beads, made of various kinds of stones, terracotta, metals, shell, indicate the role of Dholavira in the development of these craft activities. The location of Dholavira in close proximity to several of the raw material sources of agate-carnelian and the networking with other Harappan sites in northern Gujarat clearly indicates its strategic importance in raw material acquisition, development of industrial production of a variety of beads. This is further substantiated by the presence of over 1600 drill bits of 'ernestite' from the site. The beads collection from Dholavira also includes substantial number of decorated (etched/bleached) carnelian beads, which were exported to the Mesopotamian region during second half of 3rd millennium BC and were of extreme importance. The traditional decoration techniques of carnelian beads as documented by Mackay and its finds from several historical sites indicate a long continuation of production since Harappan times. The presence of the beads from several sites in Arabia, West Asia, Iran indicates their demand thereby supporting a thriving bead industry of the Harappans particularly from the modern Kachchh region.

Keywords: Indus Civilization, Dholavira, Ancient beads, Carnelian, Bleached, Etched.

Dholavira (23° 53' 18.42" N; 70° 12' 46.81" E), district Kachchha, Gujarat is located on a desolate island of Khadir in the Great Rann of Kachchha (Figure 1). The excavations for thirteen field seasons during the years 1989-90 to 2004-05 have brought to light seven cultural stages of the early, mature and late Harappan phases recording the beginnings of the city, rise, expansion, full bloom, decline and ultimately abandonment marking 1500 years of occupation with interregnum in between (Bisht 1991). The habitation at Dholavira was well planned in the form of a parallelogram, located between two seasonal rivulets, Manhar on the south and Mansar on the north (Figure 2). The remains including the cemetery accounts for nearly 100 ha, out of which, half of the site corresponds to fortified settlement (Bisht 2014). The entire occupation at Dholavira has been divided into seven cultural states, Stages I to VII, with the Stage I to III corresponding to proto-urban phase, followed by Stages IV and V representing the Harappan phase, Stage VI of the late Harappans after a brief desertion and Stage VII de-urbanised later Harappans, again after a desertion (Bisht 2014).

The evidence for bead manufacturing at Dholavira is from the Stage I onwards with humble beginnings, reaches the maximum activity during Stages IV and V and continues into Stage VI (Prabhakar 2012). The presence of around 1588 drill bits of ernestite, finished and unfinished beads, bead roughouts, bead working areas along with bead polishers *in situ* all attest to a brisk bead manufacturing industry at Dholavira.

The Harappans embellished various categories of beads and among them, the types known as 'long barrel cylindrical beads' (also known as long carnelian beads and long bicone beads) and decorated (etched / bleached) carnelian beads, are the most important ones, in terms of indication of social hierarchy, technological markers and items of long distance trade. They are also important due to their uniqueness, lustre, colour and decoration, the last, particularly of the so-called 'etched' beads. The presence of beads of agate-carnelian has been attested from several cultures of 3rd millennium BC along with evidence of manufacture. However, scholars generally agree that the long carnelian beads and decorated carnelian beads were definitely of Indian or Indus origin (Reade 2001: 27; Kenoyer 1997). The decorated carnelian beads attracted the attention of scholars ever since the sites of Harappa and Mohenjo-daro were excavated and identified of the same culture. Mackay (1933) describes the decorated carnelian beads as '*carnelian beads with designs in white and sometimes black*'. Mackay (1943) further describes them as '*decorated carnelian beads*' and later uses the term '*etched carnelian beads*'.

Beck (1933, 1940) described them as 'etched' carnelian beads in two varieties, as '*more usual [...] pattern made with white lines on a background of the natural colour of the stone*' and '*whole surface of the stone whitened and then a design in black made upon*'. The widespread presence of decorated carnelian beads from the sites in India and Mesopotamia has been noticed by Mackay (1933). Later, the presence of decorated carnelian beads from

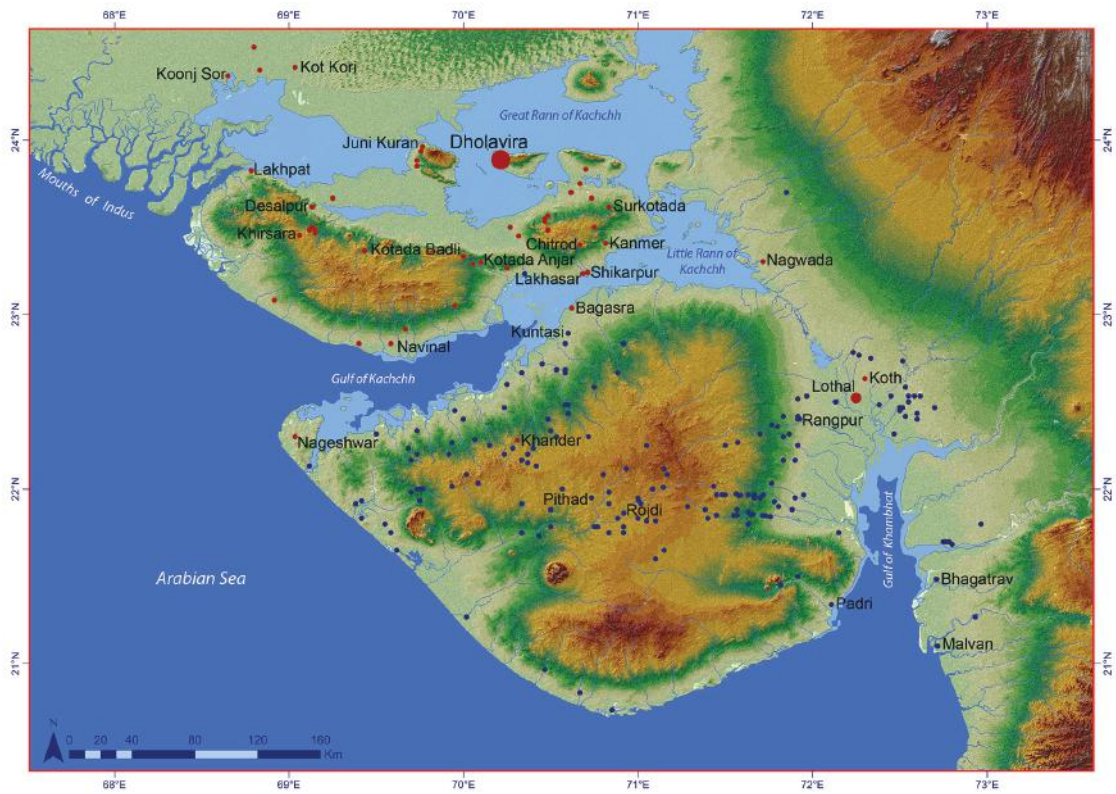


Figure 1. Map showing the location of Harappan sites in Gujarat (map by the author based on Google Earth Gazetteer prepared by Randall Law).

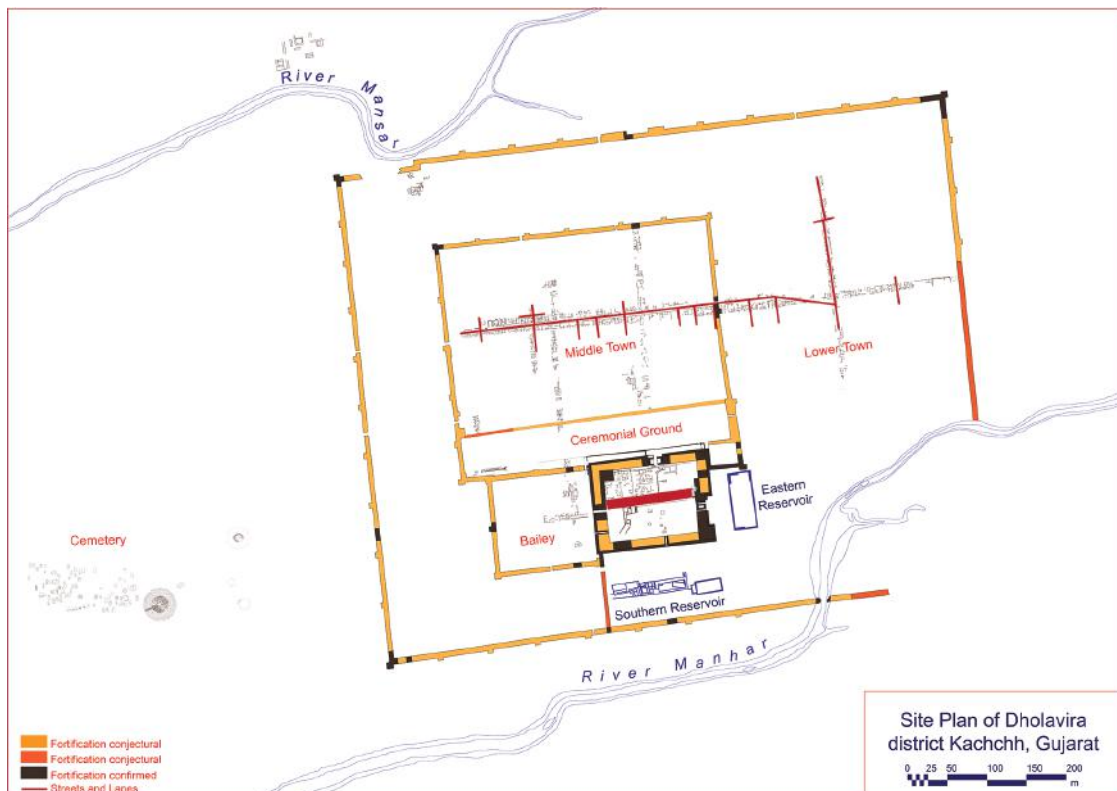


Figure 2. Site plan of Dholavira, district Kachchh, Gujarat (map by the author).

various cultural contexts starting from 3rd millennium BC has been given by Beck (1933) and Dikshit (1949), and at some sites, their presence even extends up to 1000 AD in certain regions. However, it has to be noted that the beads of 1st millennium BC and of later dates have remarkable changes in the decoration patterns and clubbed them into a singular category of 'etching' technology, irrespective of different cultural contexts.

Bellasis (1857) is probably the first one to document the 'patterns in white lines' on 'cornelian ornaments' in the modern context. Bellasis (1857) also describes the continuing tradition of manufacture in the Sindh region as, 'chief ingredients used were potash, white lead, and the juice of the kirar bush (*Capparis aphylla*), made into a thick liquid, and applied with a pen on the cornelian, which, on being exposed to a red heat in charcoal, rendered the device indelible'. It can be noted that the earliest mention of the term 'etched' was by Beck (1933) as no reference can be found in the published work of Bellasis (1857). Beck (1933), specifically describes the following two broad types:

- Type I White coloured lines rendered on a background of the natural colour of the stone.
- Type II Whole surface of the stone whitened, which serves as the background, and black designs made upon it.

Beck (1933), further describes the reason behind the shallow groove produced on the surface of carnelian beads (Type I) due to the chemical change on the application of 'alkali (generally soda)' thereby altering the coefficient of expansion of white portion, and in certain cases, even breaks away from the base, with changes in temperature and strains thus produced. Beck (1933) also proposed the following chronology of Type I beads in three distinct cultural zones (Figure 3):

Early Period	> 2000 BC
Middle Period	300 BC-200 AD
Late Period	600-1000 AD

The Type II beads were rarely represented and they were also found occurring from all the above three periods. However, looking into the pattern of decorations executed on the beads, the early period consists predominantly of an 'eye' pattern as the central theme, often encircled by two or three lines, always retaining the eye theme. In a few cases, a central dot within the eye was also present. A few beads with chevrons and white lines were also noticed. From the middle period, the eye pattern becomes rare and replaced by patterns like lines, wavy lines, dots, lozenges, chevrons, guilloche and others, while in the late period, the designs are more cursive and floral in nature. Mackay (1925) discusses the technique of decorations on

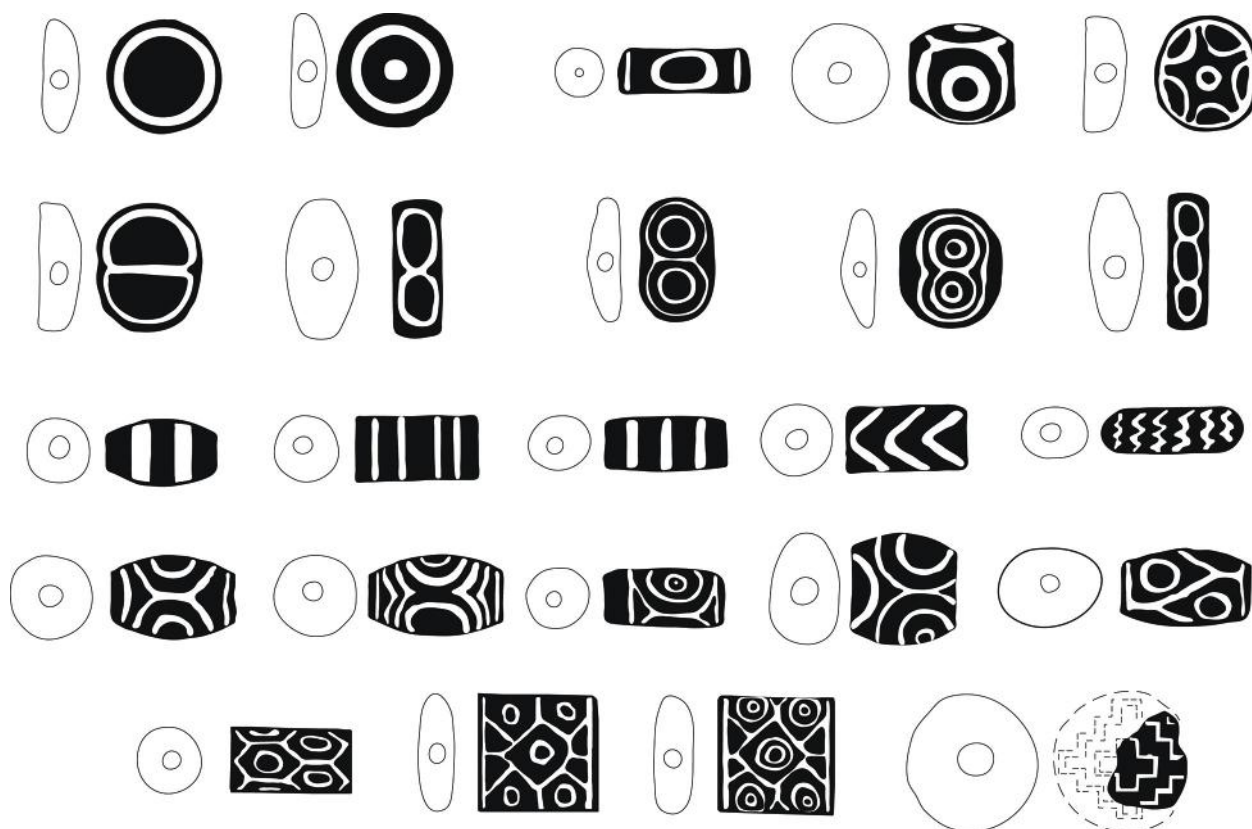


Figure 3. Types of decorated carnelian beads of 3rd millennium BC context (after Beck 1933).

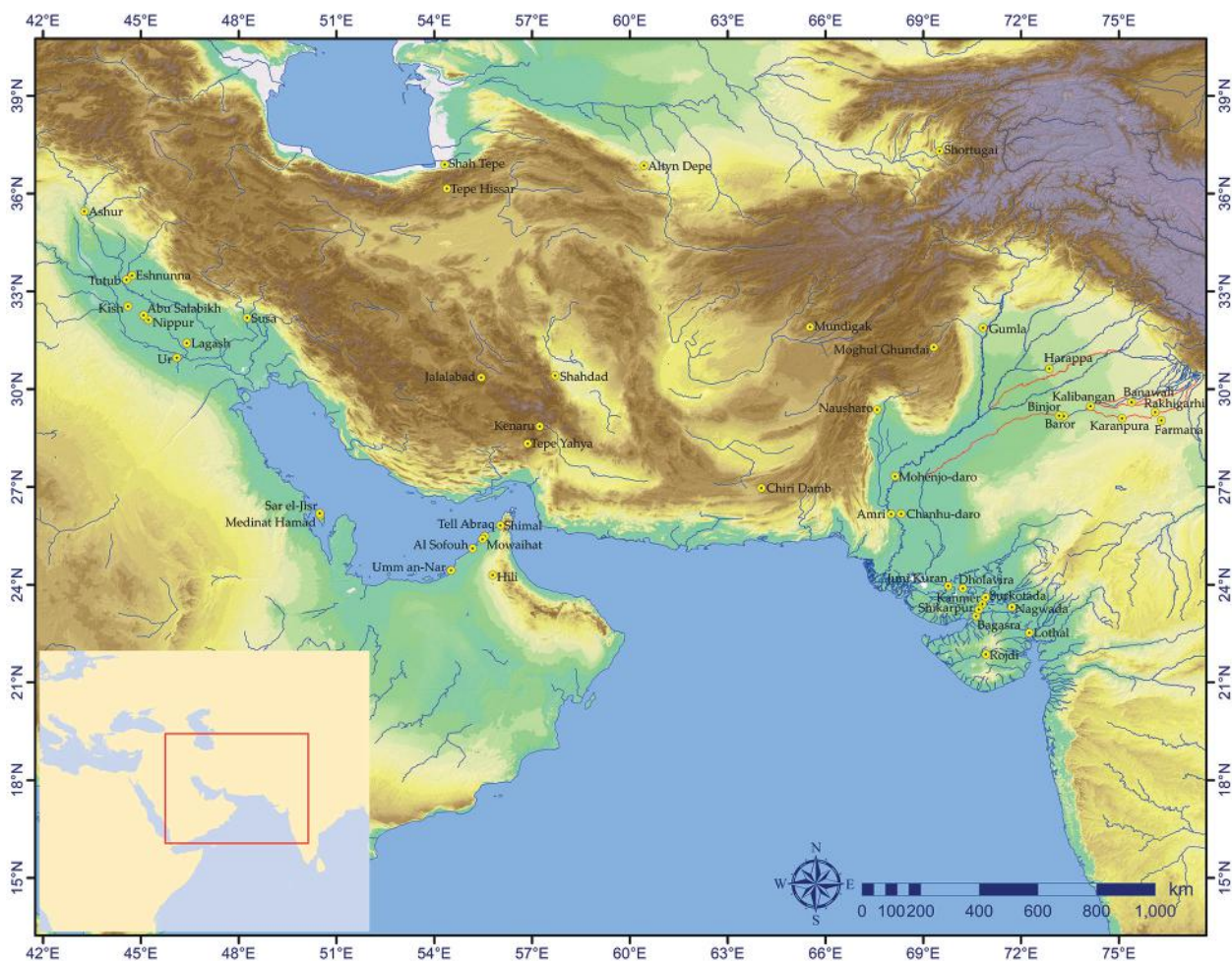


Figure 4. Map showing the find spots of 'etched' / bleached / decorated carnelian beads (map by the author).

the carnelian beads taking help from Andrews of Central Asian Antiquities Museum, New Delhi. The technique described by Andrews consists of: (i) process of calcination of the surface of bead, (ii) a layer of carbonate of soda is applied on the carnelian surface and heated, the duration of calcination determines the depth of white layer, (iii) a cement containing iron oxide applied to 'stop out' portions not desired opaque, and then reheated, which enables regaining of lost colour of 'stopped out' portions.

Mackay (1933) further elaborates the technique based on the continuation of this tradition from Sehwan in middle Sindh by a person named as Saheb-dino, aged 70 years at that time. The technique consists of: (i) macerating young shoots of *kirar* (*Capparis aphylla*) into a thick paste with the aid of wooden stick in a ceramic bowl, (ii) grinding washing soda into a fine powder, mixing it well with water and mixing the *kirar* paste, (iii) this mixture of washing soda and *kirar* paste is applied in desired pattern with a reed pen on the polished surface of carnelian bead / plaque / talisman / ring set in clay mixed with cotton wool, (iv) the carnelian object, still

in its setting, set on sheet-iron and laid on embers of charcoal. After an initial drying, the carnelian is buried in the embers and left to slow heat for five minutes, after which the object is removed and rubbed vigorously to expose the applied white decorations.

Mackay (1943) and Dikshit (1949) surmises three broad types of 'etched' carnelian beads based on the decorations executed, which are as following:

- Type I) White coloured lines rendered on a background of the natural colour of the stone, which is the most common variety of beads found;
- Type II) Whole surface of the stone whitened, which serves as the background, and black designs made upon it;
- Type III) Black coloured decorations on red surface, which are extremely rare.

Two more sub-varieties were further identified by Dikshit (1949), Variety A (a combination of Types I and II) and Variety B (combination of Types I and III). The white 'etching' is executed first in the Variety

A, following which the black lines are drawn over the partially whitened portion. The execution of simultaneous black and white lines is noticed in Variety B, without any superimposition. Further, two broad groupings for the beads were proposed by Dikshit (1949): (i) Northern Group, consisting of beads from Indus Valley, historical sites from Gangetic Valley, and on the North-West Frontier and (ii) Southern Group, consisting of beads from megalithic burials and early Historical sites.

The beads decorated with white coloured patterns datable to 3rd millennium BC is alone taken up for discussion in this paper for understanding the technique and thereby the proper terminology to be adopted.

Distribution of 'etched' / bleached / decorated carnelian beads of early period (3rd millennium BC)

The finding of 'etched' carnelian beads from different contexts and cultures indicates its widespread occurrence (Figure 4). The presence of '*carnelian beads [...] decorated in a curious manner, simple geometric form, being traced in white on red ground*' from Kish (modern Tell al-Uhaymir, Iraq) was attributed to be of Indian origin (Mackay 1925). The earliest context of 'etched' carnelian beads from Mesopotamian region dates to Early Dynastic III Period and continues well into the second half of 3rd millennium BC. Ever since the first reporting of 'etched' carnelian beads from Kish, they have been reported from several sites in West Asia, which includes Hissar, Shah Tepe, Kalleh Nisar, Susa, Jalalabad, Marlik (Chakrabarti 1977), Tepe Yahya, Tepe Hissar (all from Iran) (Possehl 1996); Ur, Kish, Tell Asmar (Mackay 1937, Possehl 1996), Tell Abu Salabikh, Nippur (all from Iraq) (Possehl 1996), Kolonna (Greece) (Rahmstorf 2015). In the Persian Gulf region, the 'etched' beads are reported (De Waele and Haerincq 2006) from Medinat Hamad / Hamad Town, Sar el Jisr (both from Bahrain), Umm an-Nar Island, Hili, Hili North (all from Abu Dhabi), Al Sufouh (Dubai), Mowaihat (Ajman), Tell Abraq (Sharjah / Umm al-Qaiwain), Shimal (Ras al-Khaimah).

Beads of this variety have been found from Harappan sites like Banawali (Bisht 1993), Baror (Sant *et al.* 2004-05), Binjor, Chanhu-daro (Mackay 1943), Amri (1964), Chiri Damb, Dholavira (Bisht 2017), Farmana (Konasukawa *et al.* 2011), Gola Dhoro (Sonawane 2005), Gumla (Dani 1970-71), Harappa (Vats 1940, Kenoyer 1991), Juni Kuran (Pramanik 2003-04), Kalibangan (Ghosh 1961), Kanmer (Endo *et al.* 2012), Karanpura (Prabhakar 2013; Prabhakar and Jaseera 2014), Lothal (Rao 1979), Moghul Ghundai (During Caspers 1972), Mohenjo-daro (Mackay 1931, 1938), Nagwada, Nausharo, Rakhigarhi (Nath 1999-2000), Shikarpur, Rojdi (Possehl 1996), Shortugai (Francfort 1983), Surkotada (Joshi 1990). The other sites include Mundigak in Afghanistan (Casal 1961).

Technique and terminology of 'etched' / bleached / decorated carnelian beads

The technique of embellishing white coloured decorative designs on carnelian beads during the 3rd millennium BC was rediscovered and documented since 19th century AD onwards. The earliest is by Bellasis (1857) followed by a detailed description of a tradition followed in Sehwan, Sind by Mackay (1925, 1933). Mackay (1925, 1931, 1933) prefers to address these beads as 'decorated' carnelian beads, instead of 'etched' carnelian beads, the latter terminology gained prominence in most of the later literature. Mackay (1931) describes these beads under the sub-chapter, 'Decorated Carnelian Beads and their Imitations' in the excavation report on Mohenjo-daro and specifically discusses (Mackay 1933) the carnelian beads with white coloured decorations and the existing practice in Sindh region in his article titled 'Decorated Carnelian Beads'.

However, Mackay (1938) uses the term 'etched' carnelian beads, instead of 'decorated' carnelian beads, while describing them from the excavations at Mohenjo-daro. Thus, it may be observed that while Mackay prefers to use the term 'decorated' in his publications since 1925, he prefers to use the term 'etched' in 1938. Beck (1933, 1940) from the beginning prefers to use the term 'etched' instead of 'decorated' carnelian beads. However, the exact reason for using the term is not highlighted in the publications. Rather, Beck (1933) presents a descriptive account of the effect of the while alkali decorations on the carnelian beads. Beck (1933) also notices that the alkali produces different types of effects on various stones and even different layers of the same stone, while it has least effect on layers of crystalline quartz.

The microscopic examination from the section cut across the 'etched' pattern by Beck (1933) indicates the deep penetration of white colour decorations, '*impregnated with a large number of white opaque spots*', creating an impression of formation of '*a dense semi-opaque substance*' consisting of the same crystalline structure as that of surrounding structure. This is the earliest microscopic examination of the actual 'etched' surface of decorated carnelian beads, while other publications mostly dealt with the technique and composition of painting layers that were applied, process of heating required to fuse the alkali properly. Beck (1940) further proposes that '*seems though a slow chemical change continued after burial*'. This chemical change might have created a pattern of etching on the surface of carnelian beads, even though the original intention of the bead makers was to create various decorative patterns to suit their styles, ideology and market demands. Mackay (1943) highlights the importance and difficulty in achieving the correct degree of heat as '*too much heat destroys the colour as*

well as the translucency of the stone, too little fails to fuse the alkali sufficiently’.

The term ‘etched’ carnelian beads probably gained currency since the late 1930s, after Mackay (1938) used the term as it can be noticed from the publications (De Waele and Haerinck 2006; Dikshit 1949; During Caspers 1972; Reade 1979; Rahmstorf 2015) except Kenoyer (2006), who prefers to use the term ‘bleached’ carnelian beads. While the technique of applying the white colour decorative patterns described and experimented by Kenoyer (2006) is similar to that of Beck (1933) and Mackay (1933), Kenoyer opines, ‘another technique for coloring stone is to bleach the surface to turn into white’. Kenoyer (2006) describes that the white colour on the carnelian beads is due to the ‘result of tiny microscopic fractures in the stone surface as well as a bleaching of any natural colors in the stone’. The ‘etching’ effect is also due to the erosion of bleached surface after thousands of years of burial, thus leaving a ‘shallow etched design’, and thus Kenoyer (2006) indicates the use of the term ‘etched’ is incorrect and prefers to use the term ‘bleached’.

A review of the literature published since 1925 indicates the usage of term ‘etched’ as well as ‘decorative’ carnelian beads for a special category of carnelian beads with white coloured decorations on the surface. However, the term ‘etched’ gained prominence as it can be witnessed from its usage by Mackay in 1938. Since then, this category of beads has been described as ‘etched’ carnelian beads, except Kenoyer (2006). However, as put forth by Kenoyer (2006), the term ‘etched’ is incorrect as the etching is created on the surface of the bead due to the eroding away of the bleached white designs after thousands of years. This is a valid and acceptable proposition and hence can be discarded.

Kenoyer (2006) prefers to use the term ‘bleached’ as the alkali designs applied on the surface of carnelian beads bleaches due to the heating and turns into white. The term ‘bleached’ again refers to a chemical transformation that happens due to the process of heating which aids the alkali applied on the bead surface to achieve white in colour. The usage of both the terms ‘etched’ and ‘bleached’ for the decorations on carnelian beads is purely on the basis of transformations that have occurred on them, either physically or chemically, and hence its usage is an ‘etic’ approach and does not justify the original intention of the bead makers and decorators of this special category of beads.

As originally used to describe this category of beads by Mackay (1925), the term ‘decorated’ is most appropriate, if the creation of these decorations, their purpose and functional aspects are investigated with an ‘emic’ perspective, they can be better understood.

The original intention of the bead makers may to create simple and multiple ‘eye’ decorative patterns, probably to cater to certain specific ideological and functional necessities. The secondary causes due to which bleaching and etching occurs might not have been understood in a truer sense by the bead makers and decorators.

In this regard, the imitation of decorated carnelian beads from sites like Harappa (Beck 1940), Mohenjodaro (Marshall 1931), Karanpura (Prabhakar 2014),



Figure 5. Decorated carnelian beads and imitation from Karanpura (photograph by the author, courtesy Archaeological Survey of India).

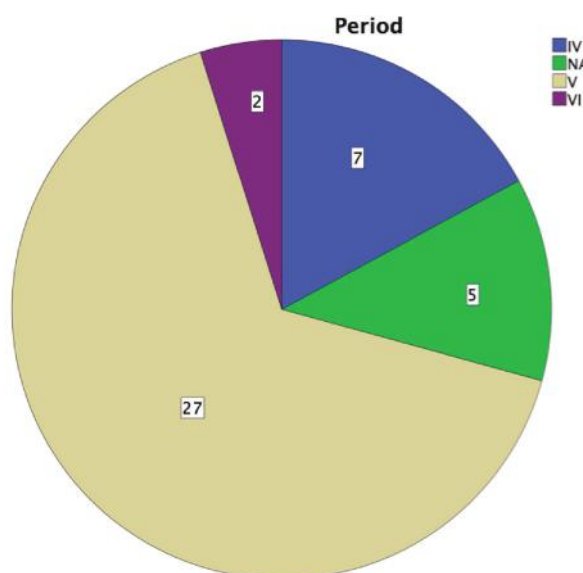


Figure 6. Period-wise distribution of decorated carnelian beads from Dholavira.

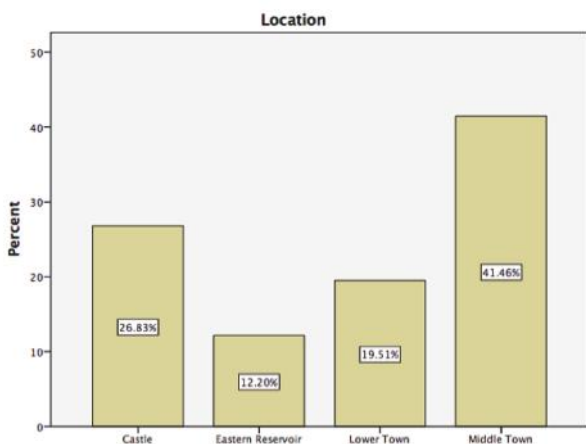


Figure 7. Location-wise distribution of decorated carnelian beads from Dholavira.

indicate that the bead makers were reproducing decorated carnelian beads to cater to certain sections of the society who might not have afforded the original ones (Figure 5). The imitation beads clearly indicate a steatite core, powdered steatite fashioned in the form of a bead, with bright red slip to imitate carnelian, and white coloured decorations applied over the red slip. These beads are good indicators of the original intention of bead makers to decorate the desired patterns on carnelian beads, without probably not understanding

the bleaching or the etching effect later produced due to chemical and physical alterations.

Decorated carnelian beads from Dholavira

The excavations at Dholavira brought to light a total of 41 decorated carnelian beads, of the Stages IV – VI, out of which the cultural contexts of five beads are unknown (Figure 6). As it has been indicated by earlier investigations, the decorated carnelian beads appear from the Harappan phase onwards (Stage IV) and continue even in Stage VI, represented by late Harappan phase at this site.

The decorated carnelian beads were documented using metrical parameters for quantitative analysis. The analysis indicates that 7 beads (17.1%) belong to Stage IV, 27 (65.9%) to Stage V, 2 (4.9%) to Stage VI and 5 (12.2%) of uncertain period. The location analysis indicates that 11 (26.8%) are from Castle, 17 (41.5%) from Middle Town, 8 (19.5%) from Lower Town and 5 (12.2%) from East Reservoir (Figure 7, Table 1). The predominant shapes are the short lenticular ones, followed by long barrel shapes. The short lenticular ones were used for the creation of single, double and triple eyed decorations, while the long barrel ones used for complex patterns and decorations (Figures 8 and 9).

The eye pattern decorations consist of both single and multiple lines. In particular, an example of multiple-



Figure 8. Dholavira: a) Single-eyed decorated carnelian bead; b) Double-eyed decorated carnelian bead; c) Multiple double-eyed decorated carnelian bead; d) Triple-eyed decorated carnelian bead (photographs by Randall Law and the author, courtesy Archaeological Survey of India).



Figure 9. Different patterns of decorated carnelian beads from Dholavira (photograph by Randall Law and the author, courtesy Archaeological Survey of India).

lined double-eyed bead is noteworthy (Figure 8c). The decoration on the beads consists of single double, triple, multiple-double and multiple-triple eyed ones. Further, a few beads with composite designs are also found from the collection. Out of these, the contexts of three from Castle and two from East Reservoir are uncertain. One specimen, with accession 4554 (2000) seems to a button, with two interconnected perforations on a flat face, while the reverse side is convex, with a decoration

of single eye. A total of only 41 beads from all cultural contexts from Dholavira is also a clear indication of its rarity, and most probably attesting its status among other bead varieties. Two more specimen of decorated carnelian beads were also recorded from the collection of beads that were on display in an exhibition titled ‘Four Great Civilizations of the World’ in Japan. One consists of single eye decoration while the second one is of triple-lined double eye decoration.

Table 1. List of decorated carnelian beads from Dholavira excavations.

Sl. No.	Acc. No.	Trench	Layer	Depth	Period	Location
1.	8905	47 X 46 X 4	1	-140 to -210	?	Castle
2.	2008.9	47 X 38	Surface	Surface	?	Castle
3.	1088	XE 22 Qd 3	Downwash		?	Castle
4.	2269 (2004)	37 X 77 X 1	3	35	?	Eastern Reservoir
5.	2482 (2003)	37 X 57	Surface	Surface	?	Eastern Reservoir
6.	11473	25 X 44 X 2	7	-120	IV	Lower Town
7.	784 (2003)	37 X 36 X 2	15	-480	IV	Eastern Reservoir
8.	23037	25 X 9 X 2	2	-102	IV	Lower Town
9.	11626	24 x 94 X 2	3	-120	IV	Lower Town
10.	23685	25 X 6 X 1	Pit 2 s.b. 3	-115	IV	Lower Town
11.	33 (2000)	37 X 55 X 2&3	10	-385	IV	Eastern Reservoir
12.	2943 (2002)	46 X 61 X 3	1	-201	IV	Middle Town
13.	4223 (2000)	65 X 33 X 1	1	-20	V	Middle Town
14.	22458	25 X 3 X 3	3	-52	V	Lower Town
15.	2008.6	37 X 91	5	-18	V	Eastern Reservoir
16.	9649	25 X 54 X 2	2	-15	V	Lower Town
17.	16578	56 X 54 X 4	2	-65	V	Middle Town
18.	5784 (2000)	66 X 53 X 3	3	-68	V	Middle Town
19.	4300	XF 22 Qd 4	18	-180	V	Castle
20.	38 (2002)	45 X 23 X 3	Surface	Surface	V	Middle Town
21.	19237	58 X 51 X 1	3	-81	V	Castle
22.	12069	65 X 4 X 2	3	-47	V	Middle Town
23.	22836	25 X 1 X 1	5	-75	V	Lower Town
24.	2519 (2002)	35 X 63 X 2	11	-97	V	Middle Town
25.	23900	47 X 27 X 2	4	-110	V	Castle
26.	4171	A 18 Qd 1	8	-120 to -130	V	Castle
27.	2008.2	44 X 45 X 2	3	18	V	Middle Town
28.	1744 (2002)	36 X 73 X 1	3	-60	V	Middle Town
29.	613 (2000)	55 X 3 X 1	2	-69	V	Middle Town
30.	2008.7	65 X 14 X 4	3	-98	V	Middle Town
31.	19790	47 X 46 and 47 X 48	3	-185 to -240	V	Castle
32.	3923 (2002)	46 X 54 X 1	2	-54	V	Middle Town
33.	4905 (2002)	55 X 82 X 2	4	-33	V	Middle Town
34.	27019	47 X 89 X 2	7	-120 to -150	V	Castle
35.	14014	15 X 54 X 4	2	-5	V	Lower Town
36.	14243	44 X 44 X 4	1	42	V	Middle Town
37.	5559 (2002)	35 X 73 X 1&2	2 and 3	-60 to -70	V	Middle Town
38.	12527	55 X 94 X 2	3	-15	V	Middle Town
39.	4554 (2000)	55 X 63 X 3&4	1	-37	V	Middle Town
40.	4601 (2002)	47 X 75 X 1	6	-85	VI	Castle
41.	1145	A 13 Qd I	2	-10	VI	Castle

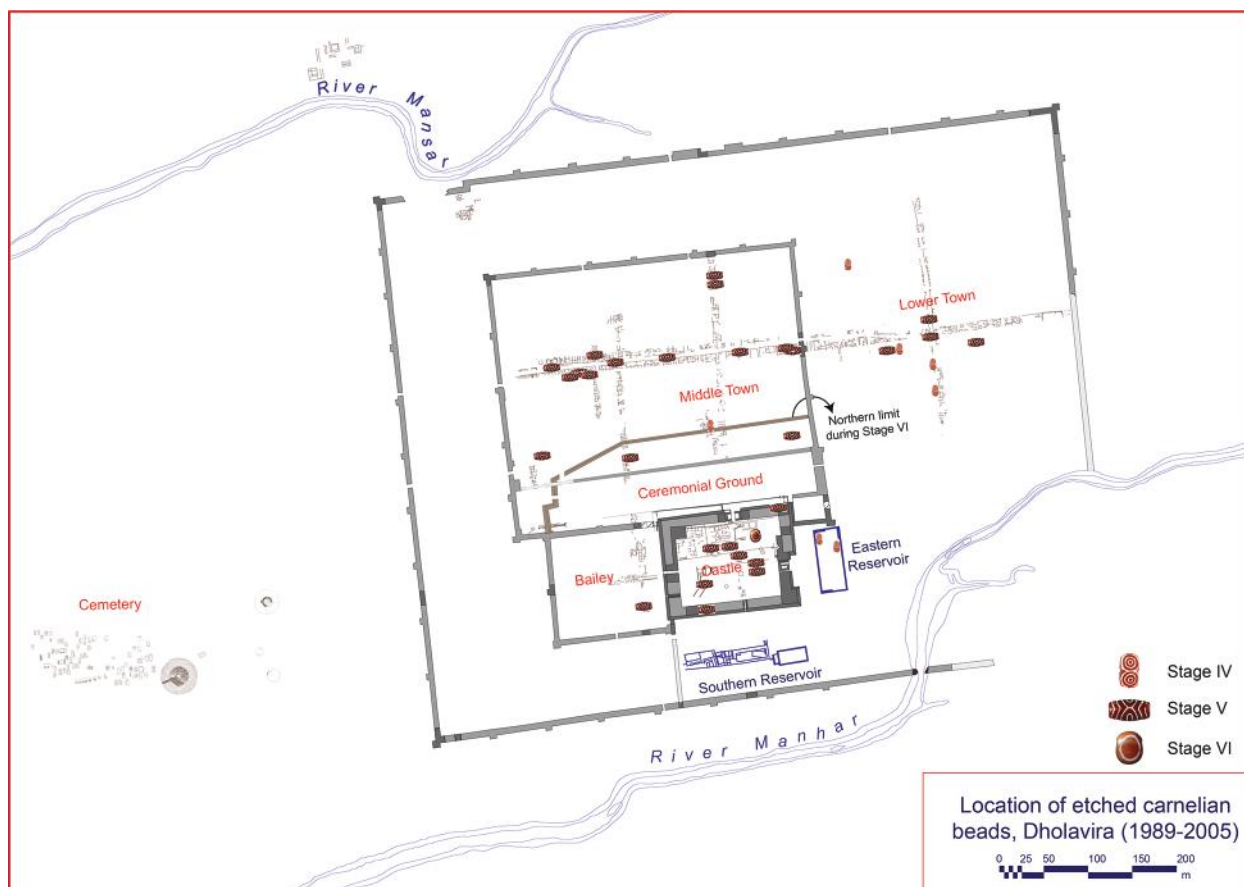


Figure 10. Map showing location of decorated carnelian beads (1989-2005) from stages IV to VI (map by the author).

Conclusion

An account of the occurrences of decorated carnelian beads from various cultural contexts and time periods along with the terminology was discussed here. While the earlier accounts of Mackay clearly described them as decorated carnelian beads, later, the term ‘etched’ gained currency. The spatial analysis also indicates a widespread occurrence of the decorated carnelian beads in different cultural contexts (Figure 10). The Dholavira examples correspond to the Type I pattern of decorated carnelian beads, described by Beck (1933) and belonging to the 3rd millennium BC. Among them, the chevron and linear decorative patterns are not present from the Dholavira collection. Otherwise, the decorative patterns correspond to those of other regions. A distribute pattern indicates its occurrence from almost all parts of the city, and as it is elsewhere, the decorated beads are only found from Harappan phase onwards, a few continuing in late Harappan phase. The possibility of the beads found from the late Harappan phase continued from Harappan phase cannot be ruled out.

Acknowledgments

The author would like to express his profound thanks to Dr R. S. Bisht, excavator of Dholavira and the Director General, Archaeological Survey of India, for permitting to document the excavated artifacts from Dholavira. The author is indeed grateful to Prof. Jonathan Mark Kenoyer for introducing the techniques for investigation of beads of Harappan context and all related studies to the author. Dr Randall Law also deserves acknowledgment for his insights on the technological aspects of stone materials and for all the thought provoking discussions on Harappan Civilization.

Bibliography

- Beck, H. C. 1933. Etched Carnelian Beads. *The Antiquaries Journal* 13: 384–398.
- Beck, H. C. 1940. Report on Selected Beads from Harappa. In *Excavations at Harappa*. Volume 1 and 2. Calcutta, Government of India Press.
- Bellasis, A. F. 1857. Further Observations on the Ruined City of Brahminabad, in Sind. *The Journal of the Bombay Branch of the Royal Asiatic Society* Vol. 5: 467–477.

- Bisht, R. S. 1991. Dholavira: A New Horizon of the Indus Civilization. *Puratattva* 20: 71–82.
- Bisht, R. S. 1993. Excavations at Banawali: 1974–77. In G. L. Possehl (ed.), *Harappan Civilization. A Recent Perspective*. New Delhi, American Institute of Indian Studies and Oxford and IBH Publishing Co. Pvt. Ltd.
- Bisht, R. S. 2014. How Harappans Honored Death at Dholavira. In N. Rao (ed.), *Sindhu-Sarasvati Civilization: New Perspectives*. New Delhi.
- Bisht, R. S. 2017. *Excavations at Dholavira (1989-90 to 2004-05)*. Unpublished Report submitted to Director General, Archaeological Survey of India. New Delhi.
- Casal, J. M. 1964. *Fouilles de Amri* (Publications de la Commission des Fouilles Archéologiques., Fouilles du Pakistan). Paris, C. Klincksieck.
- Chakrabarti, D. K. and Moghadam, P. 1977. Unpublished Indus Beads from Tehran. *British Institute of Persian Studies* 15: 166–168.
- Dani, A. H. 1970-71. Excavations in the Gomal Valley. *Ancient Pakistan* 5: 1–177.
- De Waele, A. and Haerinck, E. 2006. Etched (Carnelian) Beads from Northeast and Southeast Arabia. *Arabian Archaeology and Epigraphy* 17: 31–40.
- Dikshit, M. G. 1949. *Etched Beads in India: Decorative Patterns and the Geographical Factors in Their Distribution* (Deccan College Monograph Series 4). Poona.
- During Caspers, E. C. L. 1972. Etched Cornelian Beads, *Bulletin of the Institute of Archaeology* 10. London: 83–98.
- Endo, H., Uesugi, A., Meena, R. 2012. Minor Objects. In J. S. Kharakwal, Y. S. Rawat and T. Osada (eds), *Excavation at Kanmer 2005-06 – 2008-09*. Research Institute for Humanity and Nature, Kyoto.
- Francfort, H. P. 1983. Excavations at Shortughai in Northeast Afghanistan. *American Journal of Archaeology* 87, 4: 518–519.
- Ghosh, A. 1961. Kalibangan, district Ganganagar, Rajasthan. *Indian Archaeology A Review 1960-61*. New Delhi.
- Joshi, J. P. 1990. *Excavations at Surkotada 1971-72 and the Exploration in Kutch* (Memoirs of the Archaeological Survey of India, 97), New Delhi.
- Kenoyer, J. M. 1991. Ornament Styles of the Indus Valley Tradition: Evidence from Recent Excavations at Harappa, Pakistan. *Paléorient* 17, 2: 79–98.
- Kenoyer, J. M. 1997. Trade and Technology of the Indus Valley: New Insights from Harappa, Pakistan. *World Archaeology* 29: 262–77.
- Kenoyer, J. M. 2006. Stone Beads and Pendant Making Techniques. In J. W. Lankton (ed.), *A Bead Timeline. Vol. 1 Prehistory to 1200 CE*: 14–19. The Bead Museum, Washington, DC.
- Konasukawa, A., Endo, H., Uesugi, A. 2011. Minor Objects from the Settlement Area. In V. Shinde, T. Osada and M. Kumar (eds), *Excavations at Farmana, District Rohtak, Haryana, India*. Research Institute for Humanity and Nature, Kyoto.
- Mackay, E. J. H. 1931. Personal Ornaments. In J. H. Marshall (ed.), *Mohenjo-daro and the Indus Civilization Vol. II*. Arthur Probsthain. London.
- Mackay, E. J. H. 1937. Bead Making in Ancient Sind. *Journal of the American Oriental Society* 57, 1: 1–15.
- Mackay, E. J. H. 1925. Sumerian Connexions with Ancient India. *Journal of the Royal Asiatic Society of Great Britain and Ireland* 5: 607–701.
- Mackay, E. J. H. 1933. Decorated Carnelian Beads. *Man* 33: 143–146.
- Mackay, E. J. H. 1938. *Further Excavations at Mohenjo-daro Vol. I*. Government of India Press. New Delhi.
- Mackay, E. J. H. 1943. Chanhu-daro Excavations 1935–36. American Oriental Society. New Haven.
- Nath, A. 1999–2000. Excavations at Rakhigarhi, District Hansi. *Indian Archaeology A Review 1999–2000*. Archaeological Survey of India. New Delhi. p. 33.
- Possehl, G. L. 1996. Meluhha. In J. E. Reade (ed.), *The Indian Ocean in Antiquity*: 133–208. Kegan Paul International and The British Museum. London.
- Prabhakar, V. N. 2012. Stone Drill Bits from Dholavira – A Multi-Faceted Analysis. *Man and Environment* 37, 1: 8–25.
- Prabhakar, V. N. 2013. Excavation of a Harappan Settlement at Karanpura, Rajasthan. *Puratattva* 43: 90–99.
- Prabhakar, V. N. and Majid, J. C. 2014. Preliminary Results of Excavation at Karanpura, a Harappan Settlement in district Hanumangarh, Rajasthan. *Man and Environment XXXIX (II)*: 13–41.
- Pramanik, S. 2003–04. Excavation at Juni Kuran: 2003–04 – A Preliminary Report. *Puratattva* 34: 45–67.
- Rahmstorf, L. 2015. *The Aegean before and after c. 2200 BC between Europe and Asia: Trade as a Prime Mover of Cultural Change* (Tagungen des Landesmuseums für Vorgeschichte Halle. Band 12, 1): 149–180.
- Rao, R. S. 1979. *Lothal A Harappan Port Town (1955-62)* (Memoirs of the Archaeological Survey of India No. 78). Archaeological Survey of India, New Delhi.
- Reade, J. E. 1979. *Etched Beads and the Indo-Mesopotamian Trade* (British Museum Occasional Papers No. 2). British Museum, London.
- Reade, J. E. 2001. Assyrian King-Lists, the Royal Tombs of Ur, and Indus Origins. *Journal of Near Eastern Studies*, Vol. 60, No. 1: 1–29.
- Sant, U., Baidya, T. J., Nokeshey, N. G., Sinha, N. K., Nayan, S., Tiwari, J. K. and Arif, A. 2004–05. Baror: A New Harappan Site in Ghaggar Valley – A Preliminary Report. *Puratattva* 35: 50–59.
- Sonawane, V. H. 2005. Excavation at Bagasra, district Rajkot. *Indian Archaeology A Review 1999–2000*: 27–30.
- Vats, M. S. 1940. *Excavations at Harappa*. Volume I and II. Government of India Press, Calcutta.