

Chapter 2: Recent Survey to Some Historical and Kiln Sites

- Re-Thinking about Khmer Ceramics and Metal Pots through the Ancient Inscriptions and Bas-Relief -

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1. Introduction

Khmer Ceramics have been studied and researched for many years by the foreign scholars and researchers. It can be said at least since the discovery of a kiln known as Anlong Thom, site located in Anlong Thom village, on the top of Kulen Mount, about 30km in the north-east of Angkor Wat temple, by E. Aymonier in 1881. However, the study of Khmer ceramics was not developed for many decades. When B.P. Groslier became the conservator of the Angkor region, he did many excavation works in Angkor area, especially in the east of Banteay Kdei temple or in the west of Srah Srang, and also in Sambor Prai Kuk area, Kampong Thom province. He found huge amount and various types of pots in the excavated trenches including unglazed earthenware and green and brown glaze stoneware pots. Until, 1981, he published a text on Khmer ceramics from 9th to 14th centuries, by showing the typology and the dates of those ceramics, for joining an exhibition in Singapore. Since that time, Khmer ceramics became attractive for other scholars or researchers. But mainly, they focused on only the types, styles, decorations, and date classifications, basically depended on the results of excavations done by B.P Groslier. In 1984, D. Rooney wrote a text about Khmer Ceramics. Later, Roxanna Brown published another text on Khmer ceramics (Khmer Wares), in 1988. John Guy also began to study on Khmer ceramic and he wrote an article about A Reassessment of Khmer Ceramics, in 1997. Louise A. Cort provided another study on Khmer ceramics. She published an article about Khmer Stoneware Ceramics in the Asian Traditions in Clay. Mr. Ea Darith wrote a New Data on Khmer Ceramics and published this text in Udaya I bulletin, in 2002. In the same year, a study of Khmer ceramics from the kiln site was done by two students from the Faculty of Archaeology in Phnom Penh. That was a regional study of ceramic products found at a kiln site known as Anlong Thom that located on the top Kulen Mountain. One year later, Sok Keo Sovannara did another study on local products of ceramics at Sar Sei kiln site which situated on the edge of Kulen Mount, about 6km in the south-west of Anlong Thom kiln site. Recently, he has begun another study on Khmer ceramic typology basing on ancient Khmer inscriptions and bas-reliefs, under the support of the FOKCI.

2. Project Progress

The first attraction of the study on Khmer ceramics with old words was shown primarily in my graduated thesis, Ceramics of Sar Sei Kiln Site. Only several words were indicated by comparing to some modern words. Through the inscriptions, I am strongly interested in studying Khmer ceramics basing on the terms or ancient words that the ancient people approximately and regularly used and showed in the texts of Khmer and Sanskrit. In supporting to this

study, the FOKCI provided some fund for processing the research works in order to collect some information.

After getting the fund, we started the work from the 1st of February. We have prepared some plans and equipment for traveling to the sites where we need to go. We have divided our work in to three major works. One is site visit to some temples and sites. Second is making inventory and database of artifacts and database of inscriptions containing the words of ceramics. And the last one are drawing of ceramics fragments, analyze the result of research and making report and publication.

3. Project Participants

In order to process the project, two other members were hired to help some works. One is Mr. Phan Makara, graduated student from the faculty of Archaeology in 2006, and another one is Ms. Ly Troleak, graduated student from the Faculty of Archaeology, same year. Mr. Phan Makara mainly works together to go to the sites. And Ms. Ly Troleak mainly works in making database for inscriptions and collected artifacts. Sometimes we traveled together to the sites for visiting, collecting, drawing and sometime stamping the inscriptions from the temples' doorframes. Ms. Ly Troleak worked during one month and a half. She helped to find some documents and especially some ancient Khmer and Sanskrit inscriptions which consist of words concerning with the ceramics or metal pots. Then some of those inscriptions were invented in the database. Besides, she also went to some sites with us for collecting the ceramic fragments.

4. Work Activities

In order to progress this project, we have some major works to do, such as

A. Site Visits

The project is mainly focus on the travels to many temple and kiln sites. We have traveled to many places in some provinces. First of all, we have been to the southern of Cambodia, where we known as Ta Keo province. We went to Angkor Borei area for checking some ceramics shapes and drawing some main types of them. We have visited some other temples like Phnom Ciso and Neang Khmoa. Unfortunately, we could not find any fragments of ceramic remain around the sites.

Besides, we went to other provinces such as Prei Veng, Kampong Cham, Kampong Thom, Bothisat, Battambang, Banteay Mean Chheay, Siem Reap and Prah Vihar. Mainly we went to visit the temples where the inscriptions saying about the ceramics. But we did not get so many artifacts from those sites.

By the way, we tried to go to some places in the south, north and east of Kulen mount, where we think they can be the kiln sites. We have found two more kiln sites in the north and east of Kulen Mountain. One is called Ta Tuot or Trapeang Prasat. Another one in the east of

Kulen Mountain is called Chub Romdeng.

B. Artifact Collection

During the trips to some temples and kiln sites, we have collected some artifacts from the ground surface, not from digging. These artifacts were noted clearly the original provenance or information such as place or temples' names, province, district, commune, village, date of collecting, amount of artifacts...etc Then they were washed, drawn and invented in the database. These artifacts now are kept in Nara Office, in Siem Reap. Two groups of artifacts had been arranged in a list. One group is referred to the ceramic fragments we recently collected from the sites during our visits. Another group is belonged to some ceramic pieces picked up by Mr. Ea Darith from some sites in Uddor Mean Chheay province in the time of his works along the ancient road from Angkor to Phimai temple, in 2007. These artifacts are not yet studied and invented, so I want to arrange in our database and keep in the office of Nara Institute. Totally, the ceramic fragments collected during our trips consist of 270 pieces. And the ceramics collected by Mr. Darith are 162 pieces. These two groups of ceramics were invented and numbered from Inv. No 1 to Inv. No 425. Some fragments contain two or three pieces (but from same pots), so they were given only one number.

The artifacts are from:

- a. **Kuk Yay Ham:** It is a temple site located in Kampong Cham province, dated in Angkor period (around the end of 12th AD to the beginning of 13th AD), in the reign of King Jayavarman VII. There are twelve pieces of ceramic fragments collected from that site. These pieces were invented from number 1 to 12.
- b. **Prah Theat Srei:** It is a temple site located in Kampong Cham province, dated in Angkor period. There are four fragments collected from that site and invented from number 13 to 16.
- c. **Prah Theat Bros:** It is a temple site situated in Kampong Cham province, dated in Angkor period. There are ten fragments collected and invented from number 17 to 26.
- d. **Phnom Banan:** It is temple site located in Battambang province and dated at least from 11th AD to 13th AD. There are 16 pieces gathered and invented from number 27 to 42.
- e. **Site No 72:** It is a place located in Phnom Srok district, Banteay Mean Chheay province, along the ancient road from Angkor to Sdok Kok Thom. There nineteen pieces collected and invented from number 43 to 61.
- f. **Ta Tuot (kiln B?):** It is a site located in Ta Tuot village, north of Kulen mount, Siem Reap province. The area forms as a small mound, but not clear to be a kiln mound, contains a lot of ceramic fragments, situates on the southern dike of the moat of a temple named Trapeang Prasat. There are thirty three pieces collected and invented from number 62 to 95.
- g. **Ta Tuot (kiln A?):** It is a site situated in Ta Tuot village, north of Kulen mount, Siem Reap province. The ceramic fragments remain on a flat area looks like a platform along a small stream. There are one hundred and two pieces of ceramics picked up and invented from number

96 to 197.

h. **Veal Kok Treas:** It is a kiln site located about 15km in the east of Beng Mealea temple, in village number 104, Siem Reap province. It is a mound contains many unglazed and stoneware brown glaze fragments and kiln body. There are eighteen pieces collected and invented from number 198 to 213.

i. **Chub Romdeng:** It is a kiln site located about 15km in the east of Beng Mealea temple, in village number 103, Siem Reap province. It is a mound contains many unglazed and stoneware brown glaze fragments and kiln body. There are twenty five pieces collected and invented from number 214 to 235.

j. **Veal Trac Chour:** It is a group of kilns consists of about nine mounds. It also located about 15km in the east of Beng Mealea temple, in village number 104, Siem Reap province. The area contains many unglazed and stoneware brown glaze fragments and kiln body. There are thirty two pieces collected and invented from number 236 to 267.

k. **Kok Khjeay:** It is a place that recognized by Mr. Ea Darith as a kiln site located in Uddor Mean Chheay province. The ceramic fragments were collected during his trips along ancient road from Angkor to Phimai temple. There are twenty pieces of ceramics were collected and invented from number 268 to 286.

l. **Kok Treas:** It is a place that recognized by Mr. Ea Darith as a kiln site located in Uddor Mean Chheay province. The ceramic fragments were collected during his trips along ancient road from Angkor to Phimai temple. There are sixteen pieces of ceramics were collected and invented from number 287 to 302.

m. **Thlong Akoang:** It is a place that recognized by Mr. Ea Darith as a kiln site located in Uddor Mean Chheay province. The ceramic fragments were collected during his trips along ancient road from Angkor to Phimai temple. There are twenty four pieces of ceramics were collected and invented from number 303 to 325.

n. **Kok Ceng Mieng:** It is a place that recognized by Mr. Ea Darith as a kiln site located in Uddor Mean Chheay province. The ceramic fragments were collected during his trips along ancient road from Angkor to Phimai temple. There are twenty seven pieces of ceramics were collected and invented from number 326 to 352.

o. **Kok Yay Degn:** It is a place that recognized by Mr. Ea Darith as a kiln site located in Uddor Mean Chheay province. The ceramic fragments were collected during his trips along ancient road from Angkor to Phimai temple. There are fifty nine pieces of ceramics were collected and invented from number 353 to 407.

p. **Thlok Khdom:** It is a place that recognized by Mr. Ea Darith as a kiln site located in Uddor Mean Chheay province. The ceramic fragments were collected during his trips along ancient road from Angkor to Phimai temple. There are nineteen pieces of ceramics were collected and invented from number 408 to 425.

C. Inventory of Artifacts

We are mainly working in Siem Reap for making databases for collected artifacts. All the artifacts were carefully cleaned and washed with water, then dried under the sunlight for a short time before dried them again by the fan's wind. After that, we gave the numbers for each piece of ceramics. These pieces were invented and recorded (separately only sites' name) in Excel (list of inventory) and FileMaker (database). The Excel Page shows only information of inventory numbers, bag number, site name, province, layer (in this case, it is referred to surface collection), date of collection, shape of vessels, origin (Khmer or other countries' produces, like Chinese...) quality (earthenware or stoneware), portion (rim, neck, shoulder,...etc), fabric color (gray, red, light gray,...etc), glaze (unglazed, green, brown...etc), dimension (width, height, and thickness), weight, decoration and amount. Otherwise, detail information is shown in FileMaker file (database). It provides more details of the characters of all the artifacts that indicated in the excel file. Typically, the shapes of the artifacts are followed Khmer words, in case some fragments can be identified and with question mark (?) for some unclear recognized pieces. The word Unknown is also utilized for some unidentified pieces. The Khmer words used either in Excel list or database pages are kumrop (cover or lid), can=cān (bowl), khuoc (bottle), kanlo (small crock), kandin (small jar), kanthor (spittoon), kundi (spout jar or kettle), kodth (urn), tanlap (covered box), chnang=chnān (cooking pot), ka-am (water jar), ung=uñ (big jar), and vang=vān (basin). In the fabric color column, some abbreviation words are used such as L.Gray (light gray), L.Red (light red), L.Yellow (light yellow), D.Gray (dark gray), D.Red (dark red), and R.Gray (reddish gray).

As for the database page there is some information shown separately in detail, such as:

-Accession Information: There are different eleven boxes. Inventory box is to show the inventory number of each fragment of ceramics. Old number box is to show other number of the artifacts, in case they used to be given inventory numbers or drawing numbers. In this box, some artifacts were drawn and provided own numbers with expression of D character which means drawing. Bag number box shows what number of the plastic bag that the artifacts are kept. The fragments are from same site and date will be put in the same bag number. Box number indicates where the artifacts kept in the box after analyzing and inventing in the database. Object name box will show the names or shapes of the ceramics by following the Khmer names such as kumrop (cover or lid), can=cān (bowl), khuoc (bottle), kanlo (small crock), kandin (small jar), kanthor (spittoon), kundi (spout jar or kettle), kodth (urn), tanlap (covered box), chnang=chnān (cooking pot), ka-am (water jar), ung=uñ (big jar), and vang=vān (basin). Some unidentified fragments will be expressed by Unknown. Material type box indicates the kinds of materials that the objects were made of. Material quality box indicates the quality of artifacts, earthenware or stoneware. Origin box shows which country the artifacts were produced and imported, example Khmer or Chinese. Period box shows what periods the artifacts are belonged to, Pre-Angkor, Angkor or Post-Angkor. Date box indicates the years or centuries of the artifacts. Current storage box shows where currently the artifacts are kept.

-Collection Information: This part shows mainly the locations from where the artifacts were collected. Site location box confirms about the names of the sites. E and N boxes show the points of GPS. Village, commune, district, province and country boxes indicate the names of each place where the sites located. Collection date box show the date of collections of artifacts (month, day and year).

-Object Character: Object type box shows the names or shapes of the objects as like as the object name box, followed by Khmer names. Shape box show the shapes of the objects, like round, cylindrical or conical...etc. Current condition box shows how large of objects remained, like whole or complete objects, a half or small pieces. Portion box shows where the pieces of the objects are from the original complete pots (rim, neck, body or base parts). Internal and external color boxes show the colors of inner and outer walls of the objects.

-Dimension: This part shows about the measurements of length, width, height, thickness, and diameter, of the objects which calculated in millimeter scale. The weight box shows the weights of objects in gram scale. Amount box indicates number of pieces of the objects or fragments. Color box shows the most visible colors of the objects. For example, one fragment has three different colors, 10% of dark red, 10% of dark gray and 80% of gray, so the most visible color will be classified in gray color.

-Making Technique: This part shows some methods of making ceramics. Forming technique mentions about what methods the potters used to form or build up the shapes of the ceramics (handing by using anvil and paddle, wheeling or turning table, coiling of clay lines and molding). Material box indicates the types of materials they used to make the objects like clay or bronze...etc. Material color box shows the colors of the materials. Temper box shows about the mixtures of the clays like sand or rice husk. Firing technique box indicates the way of firing ceramics, inside or outside the kiln. Temperature box shows approximate degree of temperature that the ceramics were heated.

-Decoration: This part mentions about the decorations on objects. Design box shows some decorations, like smoothed is referred to undecorated piece, ridged and incised lines, line of dots, impressed or cord-marks,...etc. Slip box indicates the colors of clay waters applied and appeared after firing. Painting box expresses the fragments that were painted with some colors like black or red. Glaze box shows some ceramic pieces were or not applied with glazes. Burnish box is referred to some ceramic pieces that appeared as natural glazes after firing. Mark box shows about marks that were traced on ceramics, sometimes on the bottoms and bodies. Other motif box gives some brief information of traced remains on the ceramics like the trace of polishing or trace of clay coiling...etc.

-General Information: This box provides something concerning with the collection of objects and some general information of the site and its situation.

-Edited by box: This shows who designed and recorded this database.

-Record date box: It indicates the date of recording the information.

Recent collected artifacts are 270 pieces. And former collected objects by Mr. Darith are 162 fragments. These pieces were inventoried from number 1 to number 425. Some of them consist of two or three pieces which are from the same pots, so they were counted separately but given same inventory numbers.

D. Drawing of Artifacts

Finally, some of them were selected for drawing. Actually, there is not any completed object collected from those sites. However, there are three important portions that can be used in drawing. One is rim with a part of neck or body. Another is base with a part of body. And the last one is a part of body with some designs. Even though, these drawings can not provide their original shapes and sizes, and also not be so helpful in illustrating in the publication. But they can be classified in typical shapes of ceramics that were offered and used in each site.

Systematically, we used the measuring drawing method to draw some of these ceramic fragments. Original scale of the drawings is 1/1 that means one centimeter on the drawing is equal to one centimeter of the object. The drawing of an object is presented on two sides. The right side shows a half shape of the object's body and its thickness which is illustrated by black color. The left side indicates another half of the object as its outer wall and decoration. These fragments were drawn on millimeter papers, and then they were again traced in illustrator software. The drawings from the same site will be arranged in the same group with identification numbers which are confirmed by the letter 'D' (that means Drawing) in front of the number. For example, D1, D2, D3...etc. We have drawn two hundred and ten pieces of collected ceramic fragments. These drawings are not used to put in the database file.

E. Inscription Inventory/Database

Another work is making a database for some inscriptions containing the words related to the names of ceramics. Around one hundred inscriptions we have found with the words of ceramics and were entered in our database. We mainly selected some old documents published by Mr. G. Coedes (in *Inscription du Cambodge* and in *BEFEO*) and from the other researchers who have written about Khmer inscriptions.

This database will give an easy way for other researchers who want to search about ancient Khmer or Sanskrit words concerning the ceramics. In this page, there is some special information used to show the original provenience of each inscription, such as:

-Accession Information: This part contains some boxes like inventory number of the inscription which is given by Mr. G. Coedes (for example K.262), other number given by *Ecole Française d'Extrême-Orient* (EFEO) or *Depot Archeologique d'Angkor* (Depot of Archaeology of Angkor, DAA) or number provided by the *Musee Albert Sarraut* (present National Museum of Phnom Penh) with the letter 'D' (example K.158=D14). Inscription Face is referred to the faces of the inscriptions. One inscription sometime has only one face. So in inscription face box will be

shown by One Face word. Oppositely, some inscriptions, specially written on monoliths, have two, three or four faces that Mr. G. Coedes had classified as Faces 1, 2, 3 and 4 or A, B, C, and D. Otherwise, some inscriptions were recorded on the temples' door frames. These faces were called southern door frames or northern door frames. Found by box is referred to scholars or researchers who found firstly the inscription. Year box is related to the year of discovery of the inscription. Language box means the languages, Khmer or Sanskrit that were used to record the meanings of the inscriptions. Line box is referred to the amount of lines or sentences of the inscription.

-Location Information: This part mainly shows the original places where the inscriptions found and current storage of those inscriptions. It will give some names of temples, inventory numbers of temples, GPS points (but in this work we did not have enough time to go to get all data of each place of all inscriptions we put in this database, so these boxes are in blank), village names, communes, districts, provinces, countries and current storage places. Some inscriptions can not be known where they are kept.

-Historical Information: This part provides information of periods which the inscriptions belonged to (Pre-Angkor, Angkor or Post-Angkor), dates (exact years or approximate centuries), styles (this follows Khmer art styles like Phnom Da, Sambor Prei Kuk...etc), founder is referred to the persons who ordered or wrote the inscriptions (Ex. Order of the king or high officers), reign is related to in which reign of the king the inscriptions were written. Text definition box provides briefly and shortly the main meaning of the inscriptions' texts.

-Ceramic Word Indication: This box shows the words, found in each inscription, concerning with ceramics or metal pots that were recorded as names of places, names of people, and objects given to some people and temples. Each word will shown like, for example kandin 116:14, that mean the word of kandin was published in page 116 of the book and in line number 14 of the original text of the inscription.

-Publication: This box gives information of former and current of the inscriptions. Example, the inscription K.257 was found by E. Aymonier and recorded in his book *Le Cambodge*, Tome II, in page 877, and was studied in detail again by Mr. G. Coedes in *Inscription du Cambodge*, Tome IV, from pages 140 to 150.

-Edited by box: inform about the editor who designed this database page and entered all information in the pages.

-Date of Edition: indicates the years, months and days of entering the information into the database pages.

-Picture boxes: There are three boxes of pictures in this page. The upper box contains the image of original text of the inscription. The lower box is for showing the photo of temple where the inscription founded. And the lowest box shows a copy of map which indicates the location of the temple or place where the inscription discovered. The maps we used are from the recent data made by under the cooperation between the Ministry of Culture and Fine Arts and the

F. Inscription Printing

Another goal of the work is to print the inscriptions from the original texts which written on the steles or door frames of the temples. These inscriptions will be used in database pages. We used thin paper and black ink for copying the inscriptions' text. But this work is not possible because some of those inscriptions were already removed or transported from the original places, while others, especially the inscriptions on temples' door frames, were covered by sandstone blocks fallen down from the tops or roofs of the temples. Only a few inscriptions were printed from the original texts. Thus, we used the original copies made by Mr. G. Coedes and other researchers for the inscription database concerning with ceramic words.

G. Document Gathering

We collected some documents from some libraries in Phnom Penh and Siem Reap, including library of the Royal University of Fine Arts, library of Phnom Penh National Museum, library of EFEO and library of Center for Khmer Study. The books and documents we gathered are mainly related to ancient Khmer inscriptions, Khmer arts and sculptures on bas-reliefs, and ceramic arts. The important books are *Inscription du Cambodge*, from volume 1 to 7, that published by Mr. G. Coedes. Some other articles concerning with ancient Khmer inscriptions published in the *Bulletin de l'Ecole Française d'Extreme-Orient (BEFEO)*. Another book published by Ms. Pov Saravos, titled *Nouvelles Inscriptions du Cambodge* (tome 1 and 2) is also very useful for this study. Besides, there are more articles and books related to Khmer inscriptions and ceramic arts collected for supporting the work and publication.

5. Discoveries of Kiln Sites

During the trips, two sites were visited and thought to be the ancient production places of ceramics. Those places are recognized as kiln sites.

The first site is called Ta Tuot located in Ta Tuot village, Kantuot commune, Svay Leu district, Siem Reap province, about 5km in the north-east of Kulen mountain. Observably, there are two different places of this site. One is called Ta Tuot Kiln A (GPS Point is E=0409887 and N=1508464), situated on a large platform, contains a lot of broken ceramic pieces including earthenware, stoneware, unglazed and green glaze. But there is not any evidence of kiln body remaining around the area.

Another place is called Ta Tuot Kiln B and located about 200m in the south-east of the first place. It situates on the southern dike of the moat of a temple known as Trapeang Prasat temple (GPS Point is E=0410066 and N=1508322). There is only one mound which forms as probably kiln mound that contains some blocks of burned clay or kiln body. It consists of mainly fragments of brown glazed wares and some earthenware, green glaze and Chinese white porce-

lain.

The second site is located in Beng Mealea commune, Banteay Srei district, about 15km in the east of Beng Mealea temple. It is divided into three different places. One is called Chub Rodeng kiln situated in village No 103 (GPS Point is E=0432142 and N=1484903), around 300m in the south of ancient road from Beng Mealea to Prah Khan of Kampong Svay. There is only one mound built up on a flat area, faces to north toward the ancient road. Evidentially, this mound was constructed by laterite blocks and clay. Basing on the remains of kiln walls, the size of the kiln is measured about 10.5m to 11m in length and 1.5m to 1.6m in width. This kiln produced mainly only stoneware brown glazed and some unglazed wares. These wares are big jars and basins designed with ridged, incised and geometric lines. Another place is called Veal Kok Treas located in village No 104 (GPS Point is E=0433173 and N=1484076) about 500m in the east of Chub Rodeng kiln. It consists of only kiln mound which built up on a flat area, and faced approximately to the north, toward the ancient road. The size of it is not known. This place also produced huge amount of stoneware brown glazed ware, while the unglazed seemed to be produced very few. Another place is called Veal Trac Chour located about 500m in the south of Veal Kok Treas kiln. This area consists of about nine mounds, five of them remained probably on a long dike measuring about 100m in north-south direction, and four other situated in the south-east of the dike. Unfortunately, the five mounds on the dike were already destroyed by the people by flattening them as the land border. This area produced also stoneware unglazed and brown glazed wares which are mainly big jars, basins and some spout pots. They were decorated with various designs of ridged, incised and geometric lines.

6. Ethnological Observation

During the trips to many places, we also did some interviews with local villagers and some minorities who live in Kampong Thom, Banteay Mena Chheay and Kampong Speu provinces. But we did not get much information of word concerning with ceramics because those villagers use the same words to call different shapes of pots, some of them are not clear to clarify each shape of the pots, especially some minorities people are very closed to Khmer society and use the same Khmer language to call the pots, as well. Sometime, we asked the old people who live in the pagodas about some shapes of ceramics or metal pots. Several shapes and names of the pots or metal containers are indicated by them, such as Kandin, Kralo, Khuoch, Kodth, Kam, Vang etc... However, we will try to do more researches about living words used by people in order to compare to the ancient words found in the inscriptions.

7. Publication Text Preparation

Through this work, some information has been gained for supporting the main text of studying on Khmer ceramics and metal pots through the inscriptions (basing on Khmer and Sanskrit words), bas-reliefs on walls, lintels and frontons of some temples, and real objects. The

principal points of this text relate to the arrangement of Khmer ceramic typology basing on the shapes and terms, and the understanding of kiln sites according to some evidences found in the inscriptions. Basing on the ancient inscriptions, more than forty of ancient words including Khmer and Sanskrit, concerning with ceramics and metal pots, have been found regularly used from around 9th century to 14th century. These words can be recognized as the ceramics or metal pots, but unfortunately their original shapes can not be exactly identified. Very few of them can be known the shapes because some of those words have continuously been being used by the Khmers till the present day. However, in the future these words will be studied more by comparing to some other developed words, Mon language, Cham language and other minorities' languages in order to clarify the real shapes of each word.

On the other hand, the second goal is to understand the kiln sites. Some inscriptions indicate some words or names of some places that can be thought to be kiln sites or production areas, or at least selling places or markets. For example, the inscription K.205 dated in 11th century found on the door frame of Vat Baset temple saying about the donation of some objects and servants. Some of the objects, especially ceramics, were expressed by the word of Virapura which was once presented in another inscription K.181 dated in 10th century. Firstly, this Virapura was the name of a city where probably located in the east of Beng Mealea, or approximately between the Beng Mealea temple and Sambor Prei Kuk, around in the north of Prah Khan of Kampong Svay. Secondly, Virapura found in inscription K205 could be a production place or kiln site where those ceramics were produced in special shapes. Recently, some new kiln sites have been found located in the east of Beng Mealea temple, along the ancient road from that temple to Prah Khan Kampong Svay. These will allow us to do more research and compare to the information provided by the inscriptions. Principally, we have to find out where the Virapura was in 10th century, and how large of the Virapura's territory was.

8. Conclusion

This project work is very important in order to understand about the Khmer ceramics and metal pots basing on the ancient words provided by the Khmer inscriptions. Even this time we do not have enough time to complete the whole things we need, but some information and evidences we received are very useful for supporting the text of Re- Thinking on Khmer Ceramics and Metal Pots through the Ancient Inscriptions and Bas-reliefs. By the way, some ceramic fragments were collected for further study on the transportations of ceramics from the production places to other places. These ceramic pieces were primary invented by numbering and put in database that can allow other scholars or researchers easily to search and study.

Note by editors

This chapter presents a selection of articles by Sok Keo Sovannara, a young Cambodian archaeologist and NABUNKEN's local staff member who passed away suddenly on 26 September 2021, on Khmer ceramics, one of his research themes.

This article was reported in 2008. We pray for the repose of Mr. Sovannara's soul and hope that it will help young Cambodian archaeologists to follow in his footsteps.

| Site Name | Earthenware | Stoneware | Unglazed | Glazed | |
|-------------------------|-------------|-----------|----------|-----------|---------|
| | | | | Green | Brown |
| Kuk Yay Ham | 3 | 9 | 7 | 0 | 5 |
| Prah Theat Srei | 4 | 0 | 4 | 0 | 0 |
| Prah Theat Bros | 5 | 5 | 9 | 0 | 1 |
| Phnom Banan | 7 | 9 | 7 | 1 | 8 |
| Point Number 72 | 0 | 19 | 6 | 5 | 8 |
| Ta Tuot (Kiln B?) | 1 | 35 | 5 | 6+1white | 23 |
| Ta Tuot (Kiln A?) | 36 | 66 | 62 | 39 | 1 white |
| Veal Kok Treas Kiln | 0 | 16 | 4 | 0 | 12 |
| Chub Romdeng Kiln | 6 | 20 | 7 | 0 | 19 |
| Veal Trac Chour Kiln | 0 | 32 | 5 | 2 | 25 |
| Kok Khjeay (Kiln?) | 3 | 17 | 5 | 3+1white | 11 |
| Kok Treas (Kiln?) | 3 | 13 | 5 | 2 | 9 |
| Thlong Akoang (Kiln?) | 0 | 24 | 4 | 7 | 13 |
| Kok Cieng Mieng (Kiln?) | 1 | 26 | 13 | 5 | 9 |
| Kok Yay Degn (Kiln?) | 5 | 53 | 11 | 11+1white | 35 |
| Thlok Khdom | 1 | 18 | 6 | 4 | 9 |

Chart 1 Numbers of artifacts

| COLLECTED CERAMIC FRAGMENT INVENTORY | | | | | | | | | |
|---|--|-----------------|---|--|---|---|---|--|--|
| | | | | | | | | | List 207 |
| Accession Information | | | | | | | | | |
| Inventory No | 207 | Old No | | Bag Number | 8 | Box No | | | |
| Object Name | Ung | Material Type | Clay | Material Quality | Stoneware | Origin | Khmer | | |
| Period | Angkor | Date | Unknown | | | | | | |
| Current Storage | Nara Institute Office | | | | | | | | |
| Collection Information | | | | | | | | | |
| Site/Location | Veal Kok Treas | | | | | E | 0433173 | | |
| Village Name | 104 village | Commune | Beng Mealea | | | N | 1484076 | | |
| District | Banteay Srey | Province | Siem Reap | | | | | | |
| Country | Cambodia | Collection Date | 4/9/2008 | | | | | | |
| Object Character | | | | | | | | | |
| Object Type | Ung | Shape | Round | | | | | | |
| Current Condition | Small Piece | Portion | Shoulder | | | | | | |
| Internal Color | Gray | External Color | Gray | | | | | | |
| Dimention (mm/g) | | | | | | | | | |
| Length | 180 | Width | 109 | Height | | | | | |
| Thickness | 11.5 | Diameter | | | Weight | 374 | | | |
| Amount of Piece | 1 | Color | Gray | | | | | | |
| Making Technic | | | | | | | | | |
| Forming Technic | Turning Table | | | Material | Clay | | | | |
| Material Color | Gray | | | Temper | Sand | | | | |
| Firing Technic | Inside kiln | | | Tempera. | Around 900c-1100c | | | | |
| Decoration | | | | | | | | | |
| Design | Ridged circle line | | | Slip | None | | | | |
| Painting | None | | | Glaze | Brown | | | | |
| Burnish | None | | | Mark | None | | | | |
| Other motifs | Trace of Polishing on inner wall,ear | | | | | | | | |
| General Information | | | | | | | | | |
| <div style="border: 1px solid black; padding: 5px;"> <p>This fragment was taken from a mound which shwon as a kiln located in village No 104. There is only one mound around this area. There are mainly only stoneware large jars applied with brown glaze.</p> </div> | | | | | | | | | |
| Edited By Sok Keo Sovannara | | | | Record Date 4/9/2008 | | | | | |

Fig. 17 Database Page of Collected Ceramic Fragments

| INSCRIPTION DATABASE FOR KHMER CERAMIC WORDS | | | | List |
|--|---|------------------|--------------------------------------|------------------|
| <div style="text-align: right; font-weight: bold; font-size: small;">K.262</div> | | | | |
| <div style="text-align: left; font-weight: bold; font-size: small;">ACCESSION INFORMATION</div> | | | | |
| Inv. No | K.262 | Other No | EFEO-667 | Inscription Face |
| Found by | Aymonier, E. | Year | 1901 | Language |
| | | | | Lines |
| | | | | 35 |
| <div style="text-align: left; font-weight: bold; font-size: small;">LOCATION INFORMATION</div> | | | | |
| Temple Name | Vat Prah Einkosei | Temple No | | |
| North axis | | East axis | | |
| Village Name | Trang | Commune Name | Slor Kram | |
| District Name | Siem Reap | Province Name | Siem Reap | |
| Country Name | Cambodia | Current Location | On north door frame of central tower | |
| <div style="text-align: left; font-weight: bold; font-size: small;">HISTORICAL INFORMATION</div> | | | | |
| Period | Angkor | Date | 968 A.D | |
| Style | Banteay Srei | Founder | Unknown | |
| Reign | Jayavarman V | | | |
| Text Definition | It is a Khmer text of 35 line saying about the construction of Dvijendrapura by an order of a king un-named, in 890 saka (968 A.D). It also say about the donation of objects and sculptures to the temple of Dvijendrapura, and so on. | | | |
| <div style="text-align: left; font-weight: bold; font-size: small;">CERAMIC WORD INDICATION</div> | | | | |
| patula-110:9, khlas-110:9, vausdi-110:9, vardhani-110:9, nu-110:9, bhajana-110:10, bhaja-110:10, kamandalu-110:10, koca-110:10, kalaca-110:10, arghya-110:10, sarava-110:10, khal-110:10, padya-110:11, tanlap-110:11, patigraha-110:11, kadaha-110:13, svok110:13, nong cina110:15... | | | | |
| <div style="text-align: left; font-weight: bold; font-size: small;">PUBLICATION</div> | | | | |
| Aymonier, <i>Cambodge</i> , II, 1901, p404 and next L. De Lajonquiere, <i>Inventaire</i> , III, p230. G. Coedes, <i>Inscription du Cambodge</i> , IV, 1952, Paris, p108-139. | | | | |
| Edited By | SOK KEO SOVANNARA | | Date of Edition | 2008/01/18 |








Fig. 18 Database Page of Ceramic Words in Inscriptions



Fig. 19 View of Ceramic fragments remain on ground surface of Ta Tuot kiln B



Fig. 20 View of kiln mound of Chub Romdeng kiln



Fig. 21 Inscription Printing Activity at Neang Khmoa Temple, Ta Keo Province



Fig. 22 Ceramic fragment collecting at Kuk Yay Ham Temple, Kampong Cham Province



Fig. 23 GPS data collecting along ancient road from Angkor to Phimai, Banteay Mean Chheay Province



Fig. 24 Trip to visit kiln site in Ta Tuot village, Siem Reap Province



Fig. 25 Site visit to Kuk Yay Ham Temple, Kampong Cham Province



Fig. 26 Ceramic fragment remains around Kuk Yay Ham Temple, Kampong Cham Province



Fig. 27 Site visit to Vat Baset Temple, Battambang Province



Fig. 28 Inscription on the door frame of Vat Baset temple, Battambang Province



Fig. 29 Site visit to Phnom Banan Temple, Battambang Province



Fig. 30 Ceramic fragments remained near Phnom Banan Temple, Battambang Province



Fig. 31 Ceramic fragments remained on the ancient road from Angkor to Phimai temple, Point No 72, Banteay Mean Chheay Province



Fig. 32 Kiln mound of Chub Romdeng Site, Siem Reap Province



Fig. 33 Destruction of kiln mound of Veal Trac Chour Site, Siem Reap Province



Fig. 34 Kiln mound of Veal Kok Treas Site, Siem Reap Province

Chub Rodeng Kiln Site

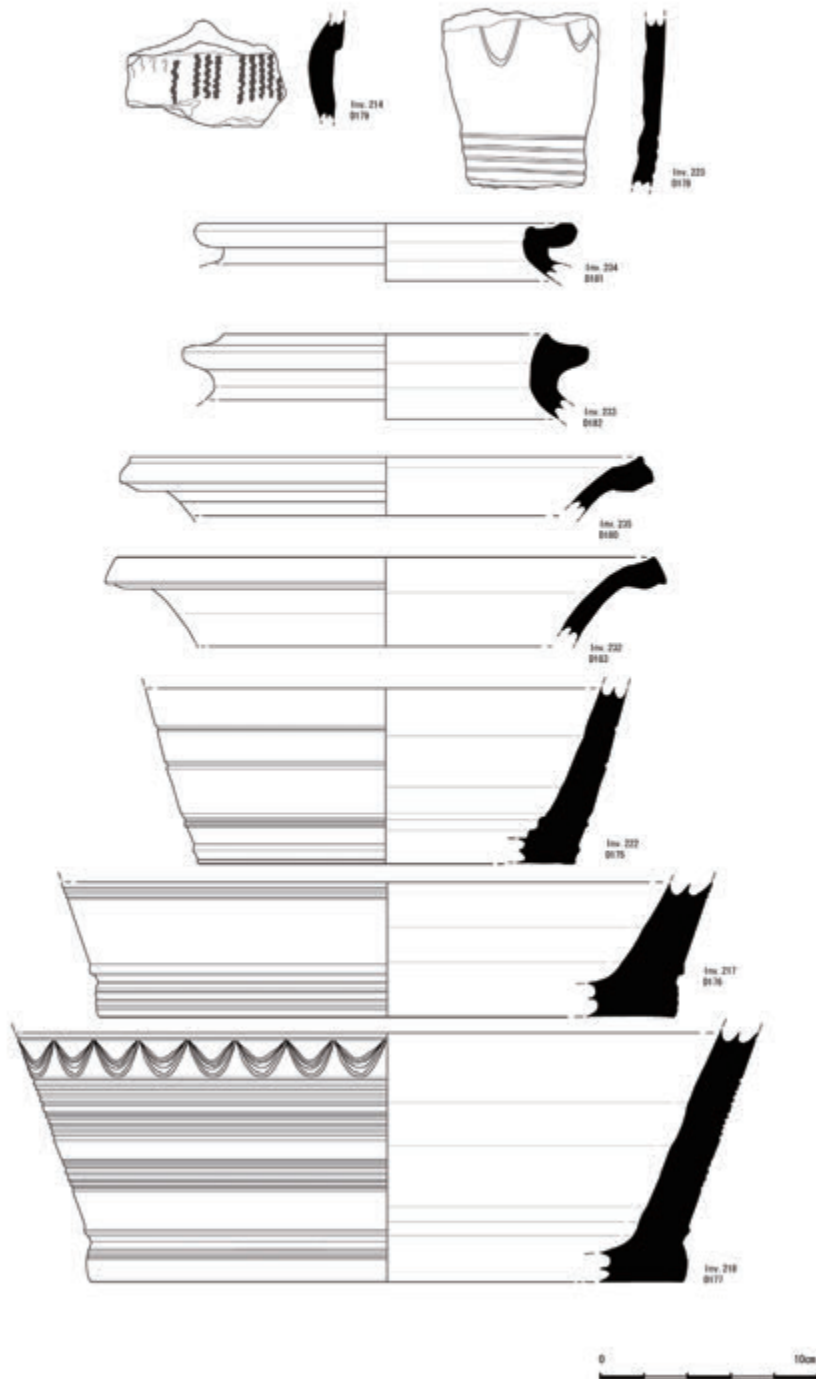


Fig. 35 Artifacts from Chub Rodeng Kiln Site

Kuk Yay Ham Temple Site

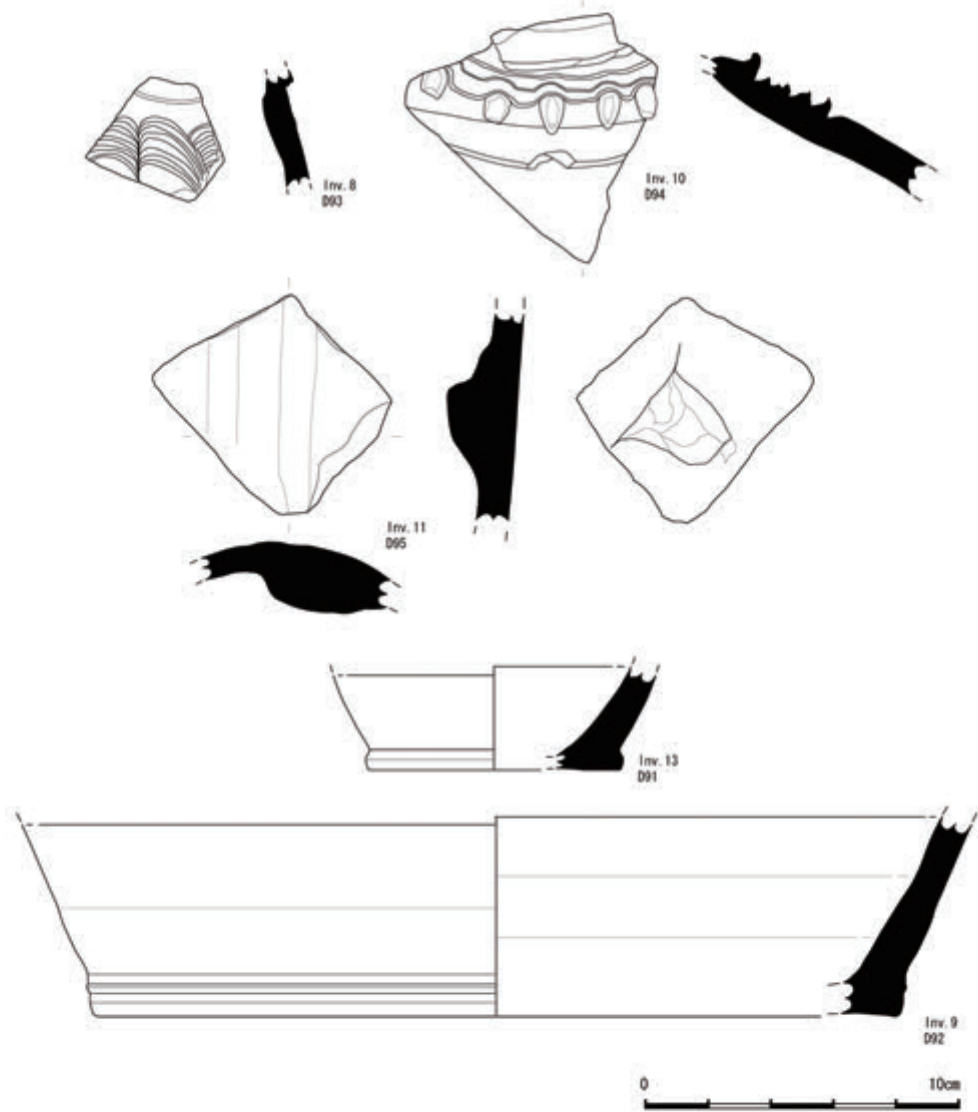


Fig. 36 Artifacts from Kuk Yay Ham Temple Site

Phnom Banan Temple Site and Point 72 Site

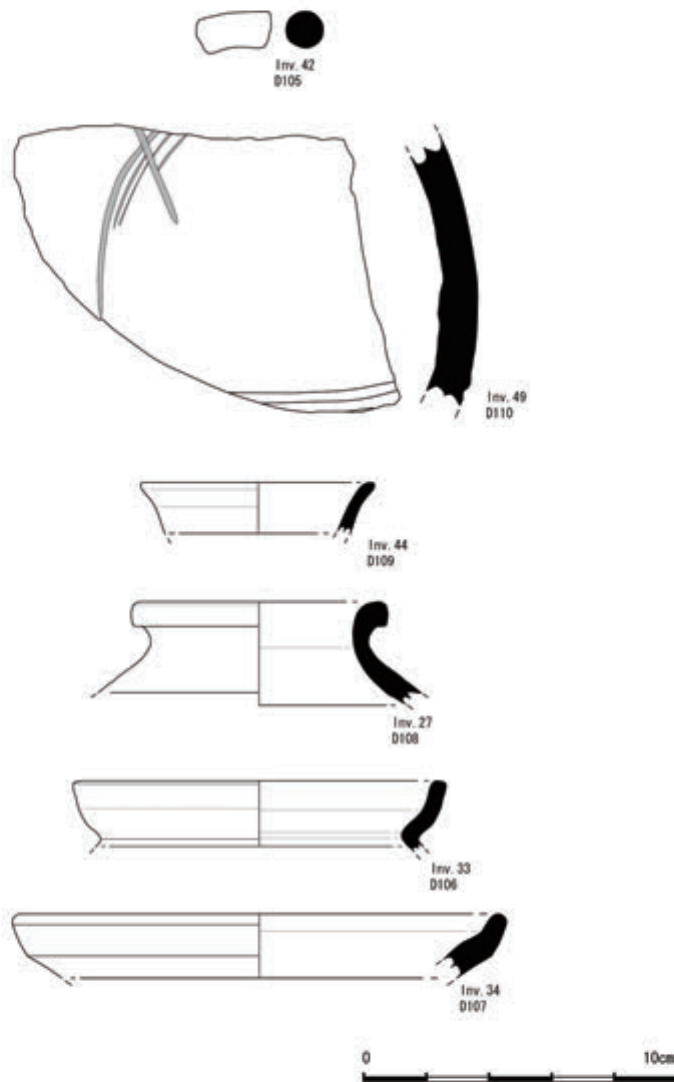


Fig. 37 Artifacts from Phnom Banan Temple Site and Point 72 Site

Prah Theat Srei Temple Site

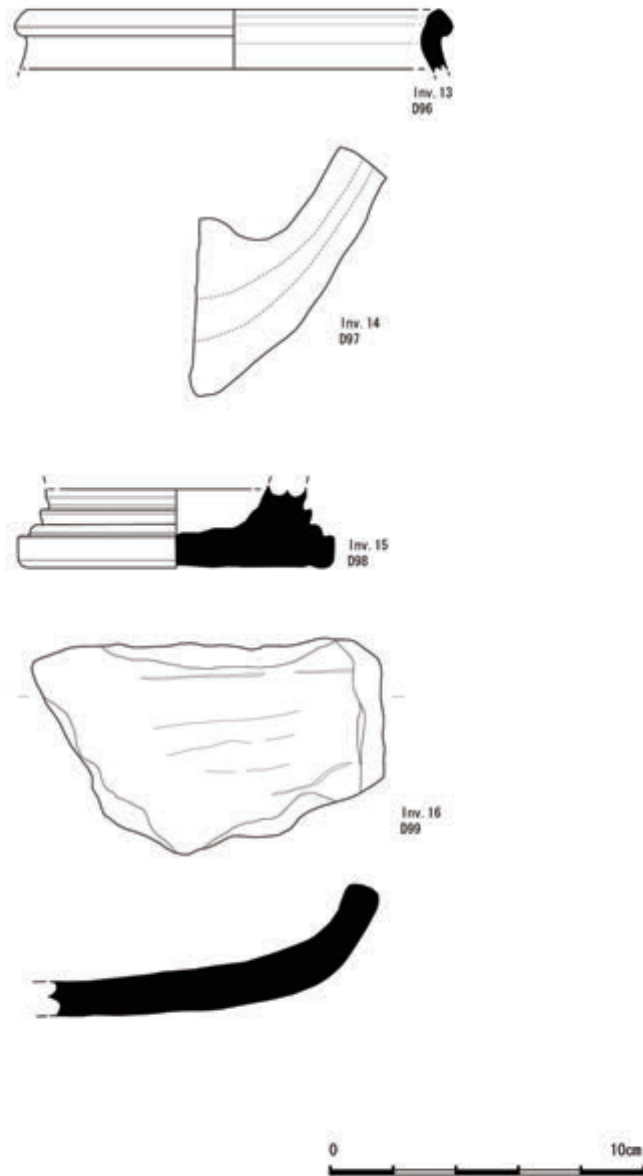


Fig. 38 Artifacts from Prah Theat Srei Temple Site

Prah Theat Bros Temple Site

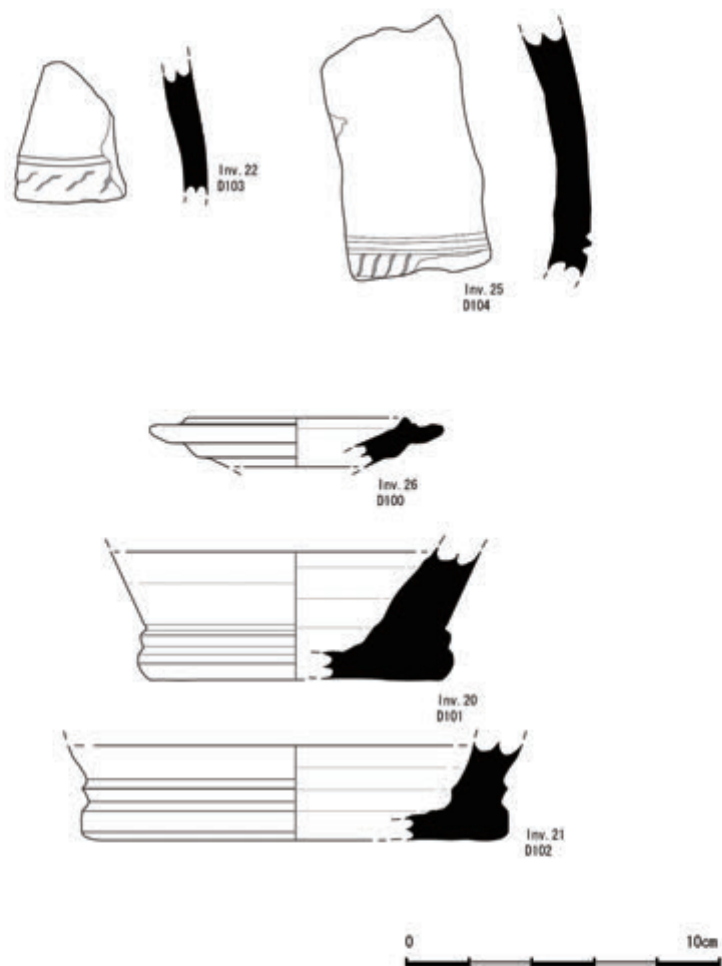


Fig. 39 Artifacts from Prah Theat Bros Temple Site

Ta Tuot Kiln A Site

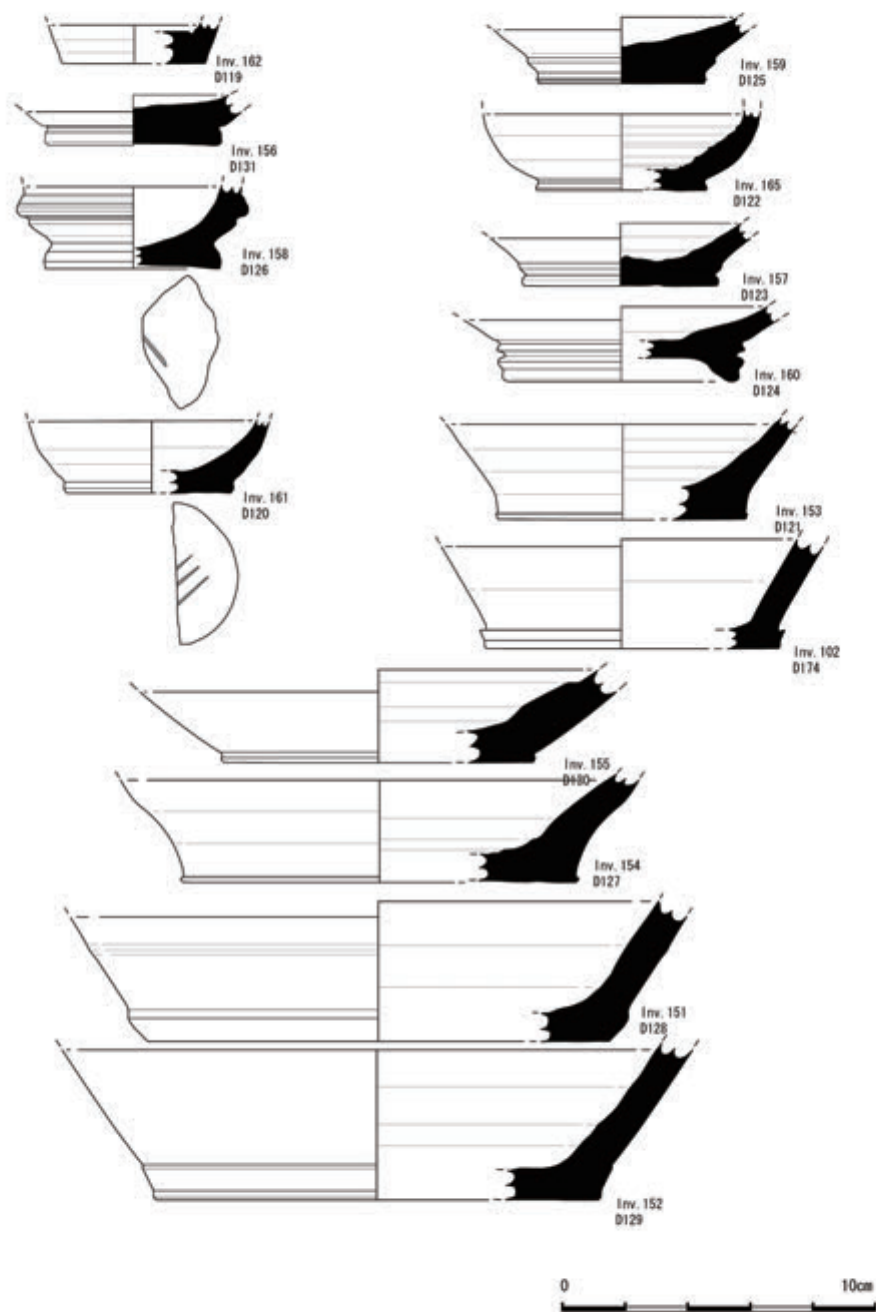


Fig. 40 Artifacts from Ta Tuot Kiln A Site 1

Ta Tuot Kiln A Site

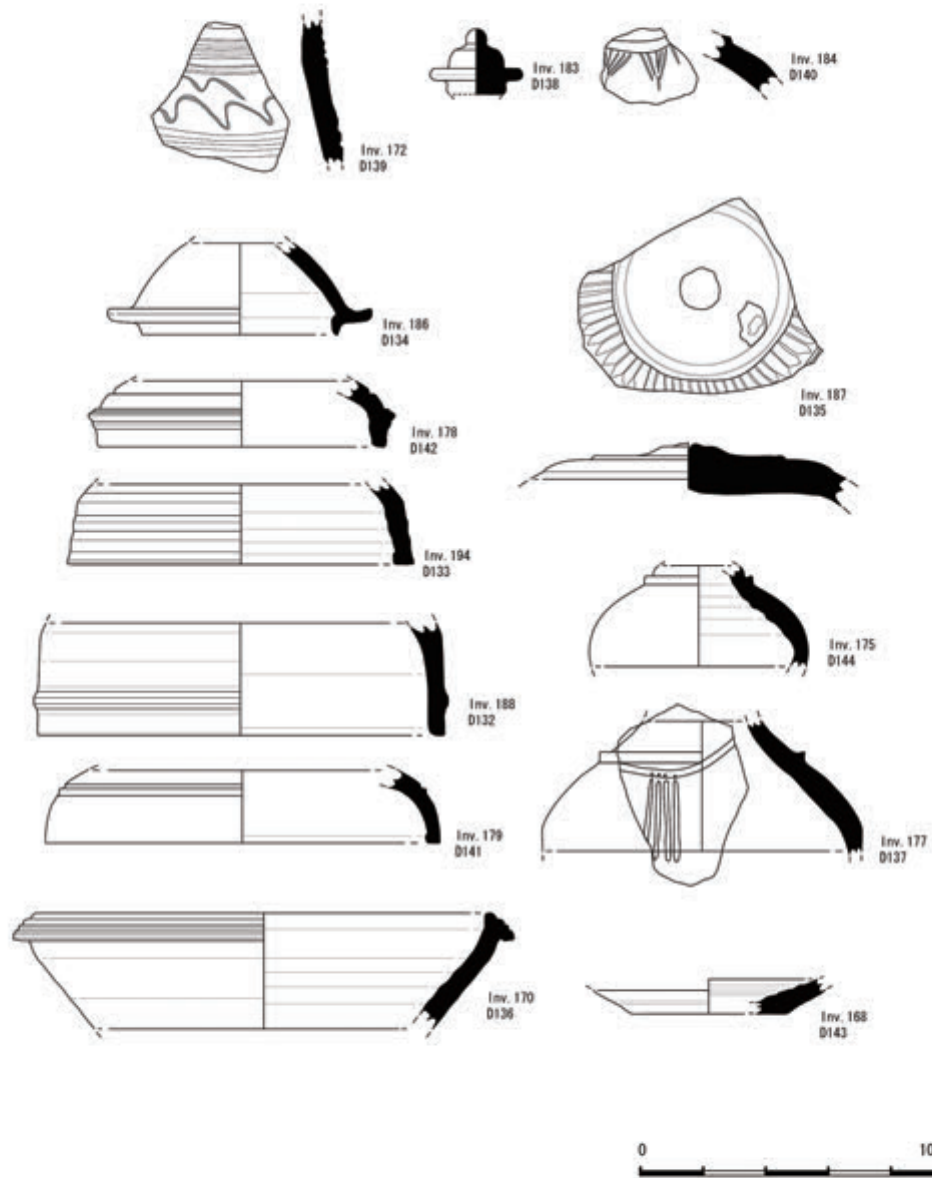


Fig. 41 Artifacts from Ta Tuot Kiln A Site 2

Ta Tuot Kiln A Site

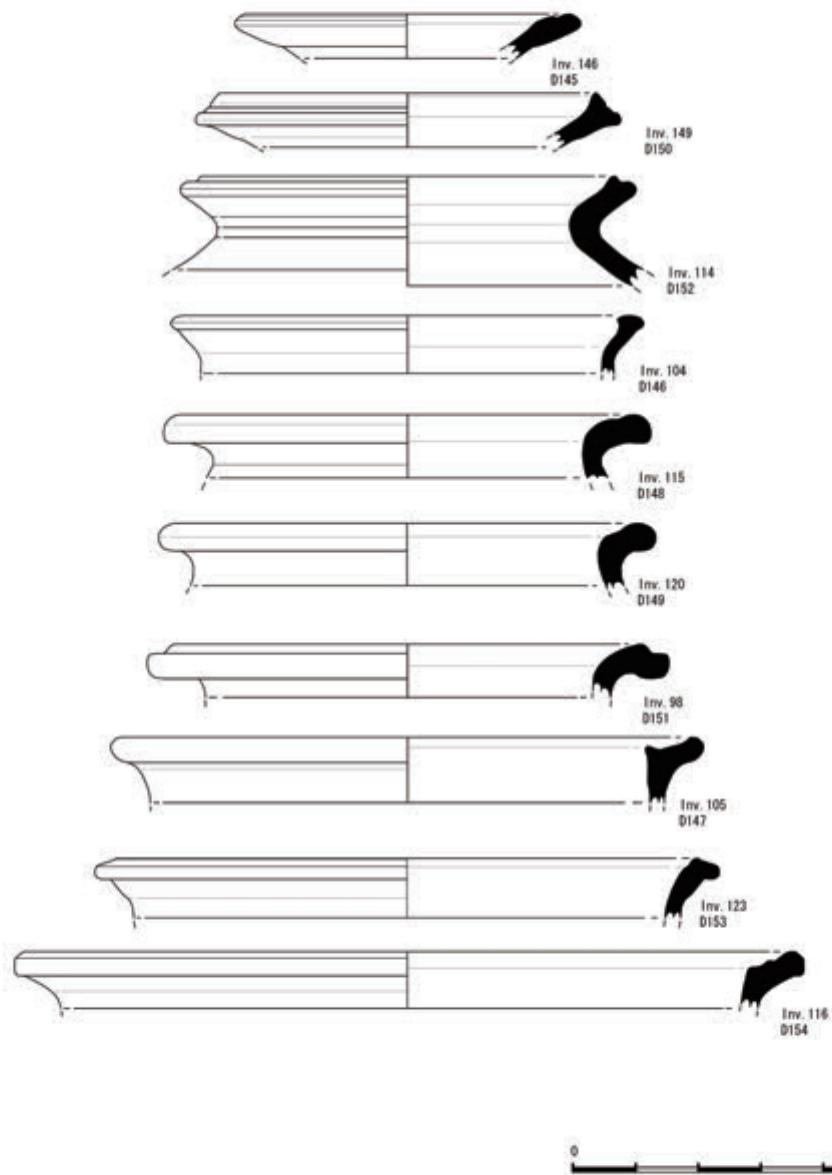


Fig. 42 Artifacts from Ta Tuot Kiln A Site 3

Ta Tuot Kiln A Site

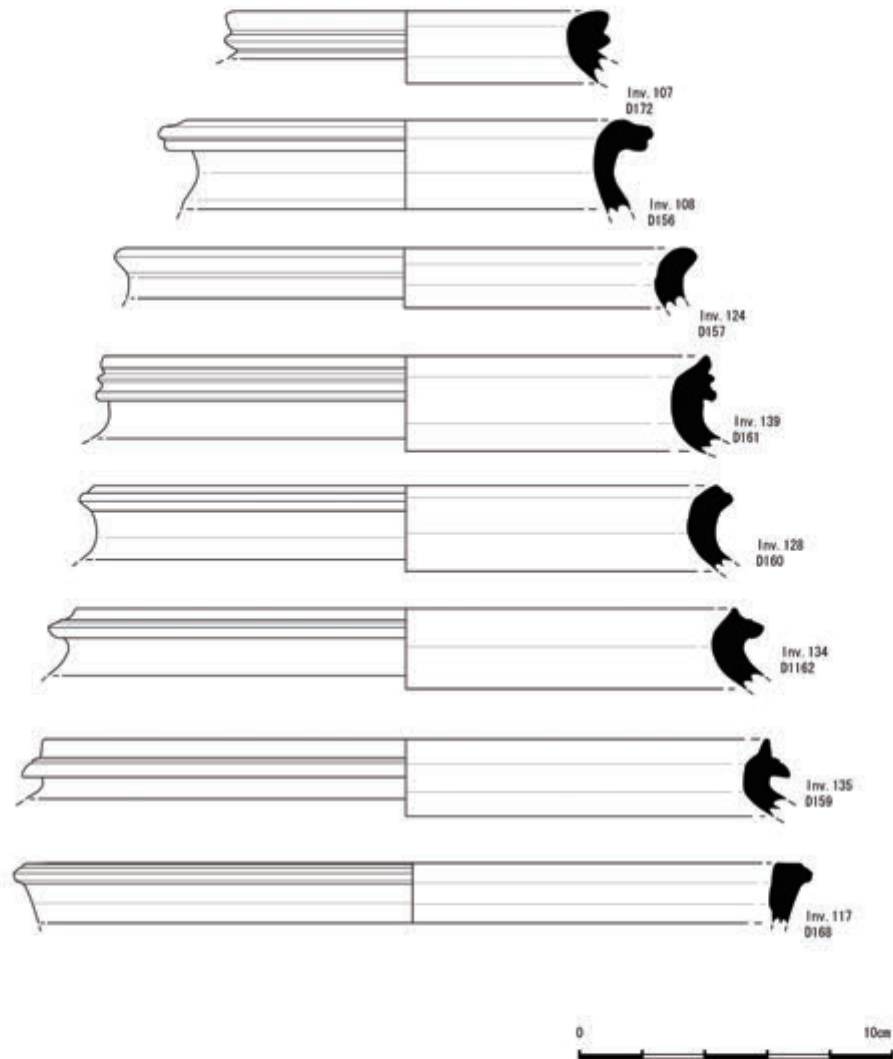


Fig. 43 Artifacts from Ta Tuot Kiln A Site 4

Ta Tuot Kiln A Site

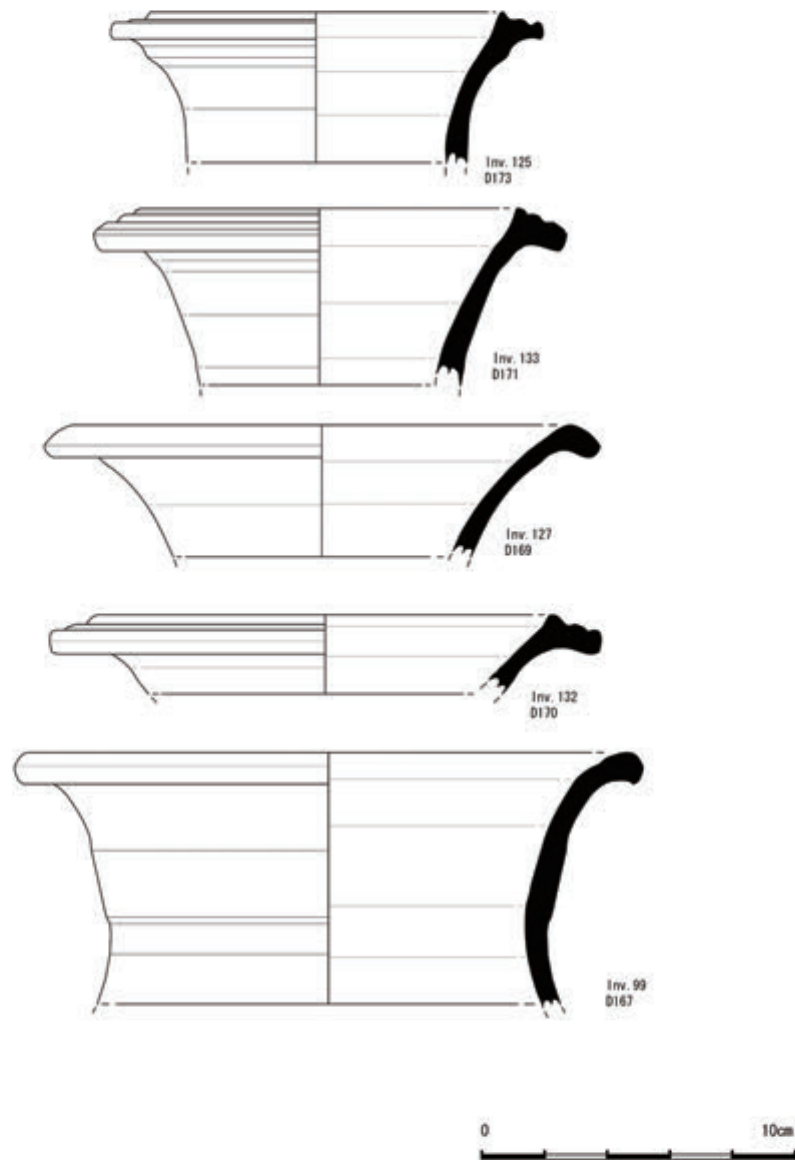


Fig. 44 Artifacts from Ta Tuot Kiln A Site 5

Ta Tuot Kiln B Site

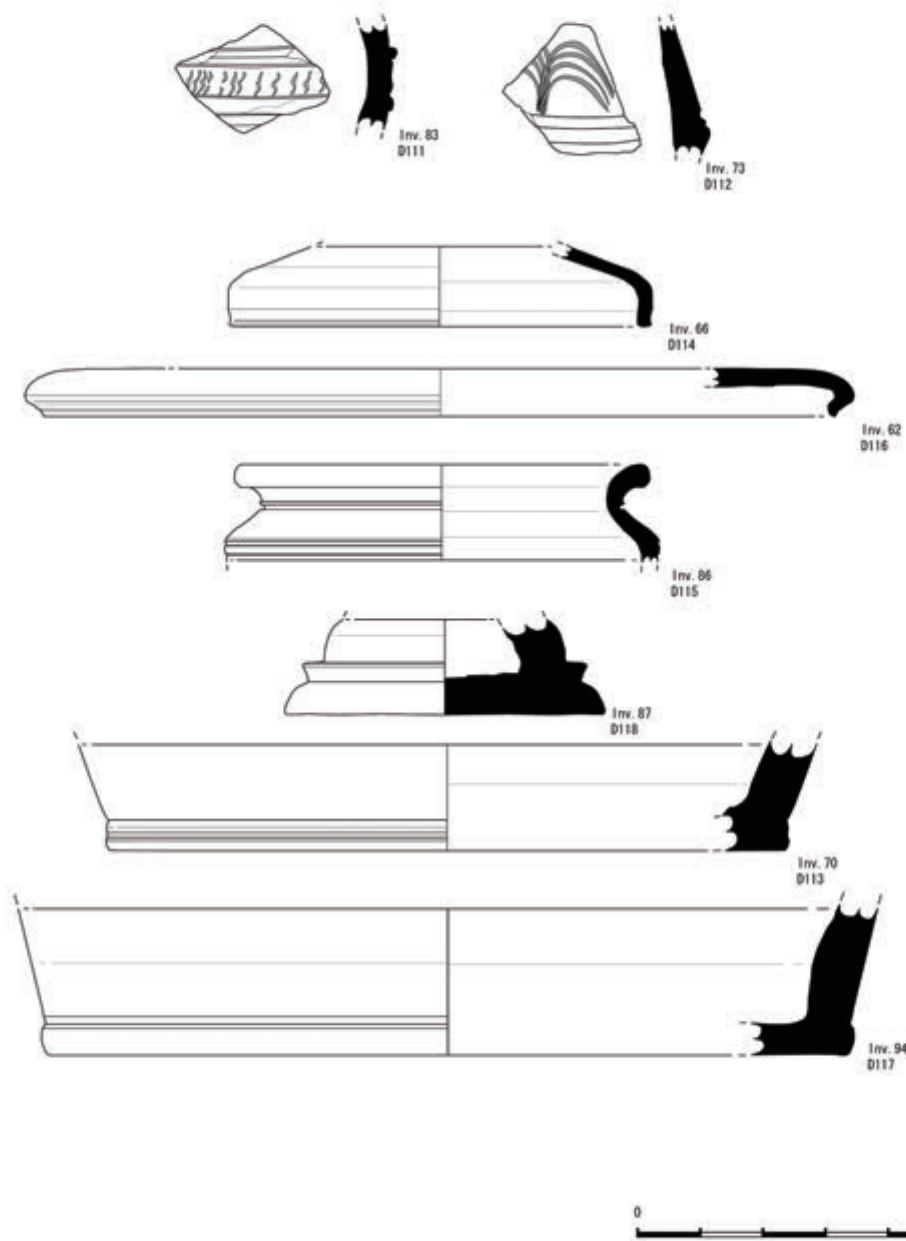


Fig. 45 Artifacts from Ta Tuot Kiln B Site 1

Ta Tuot Kiln B Site

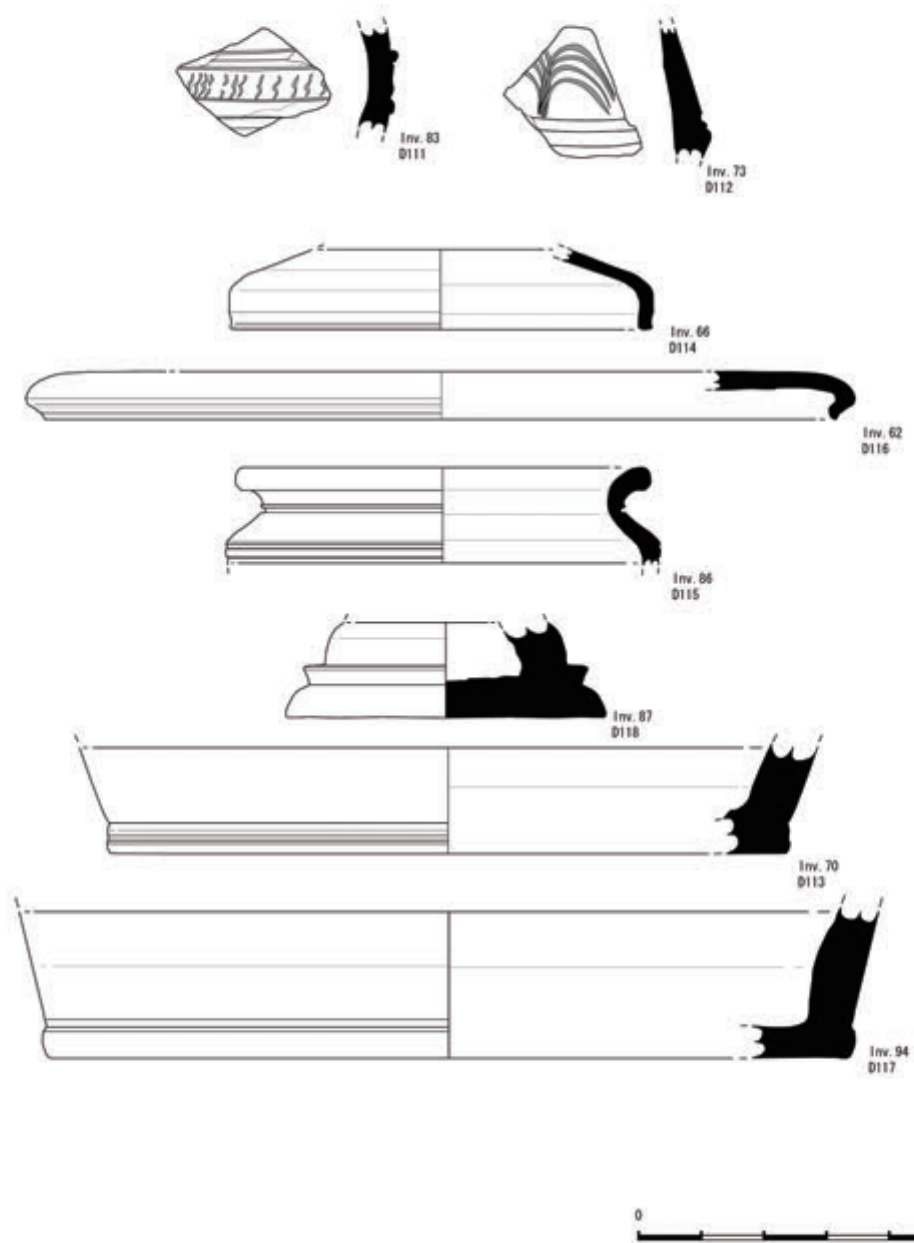


Fig. 46 Artifacts from Ta Tuot Kiln B Site 2

Veal Kok Treas Kiln Site

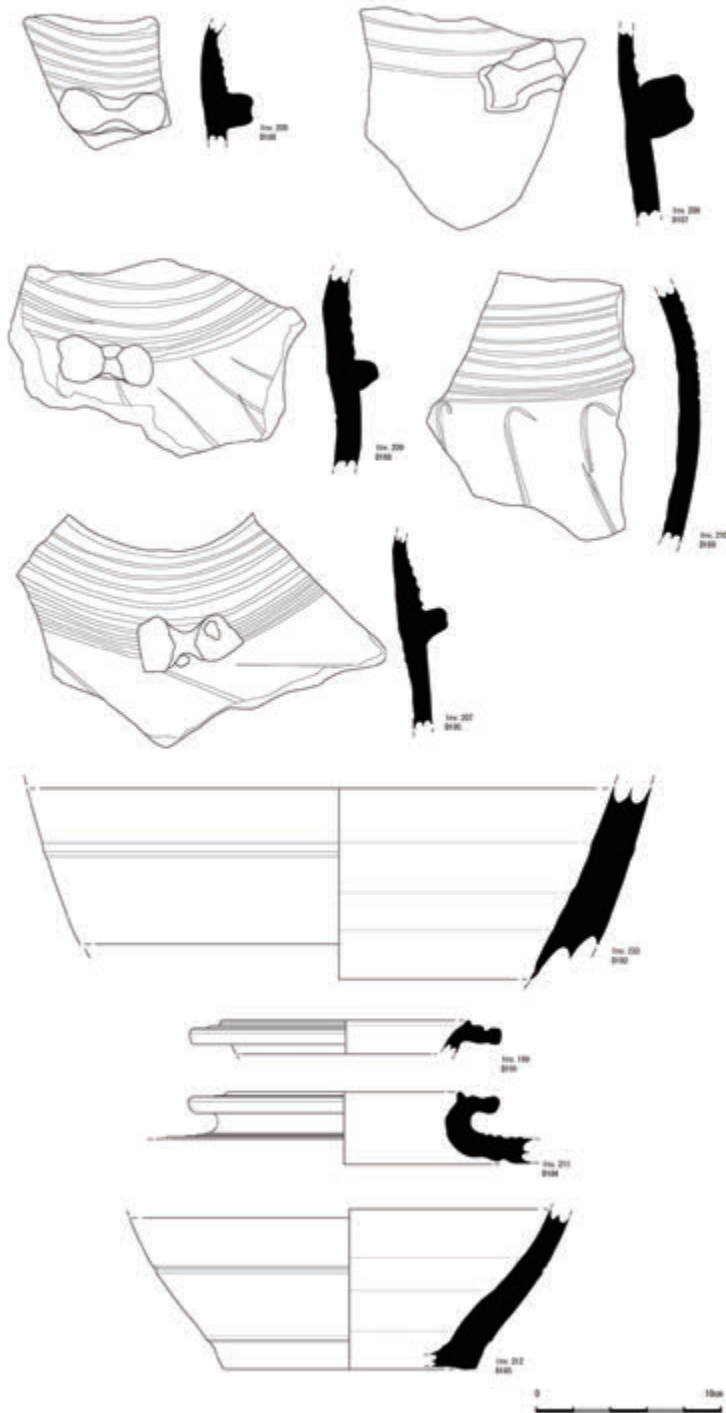


Fig. 47 Artifacts from Veal Kok Treas Kiln Site

Veal Trac Chour Kiln Site

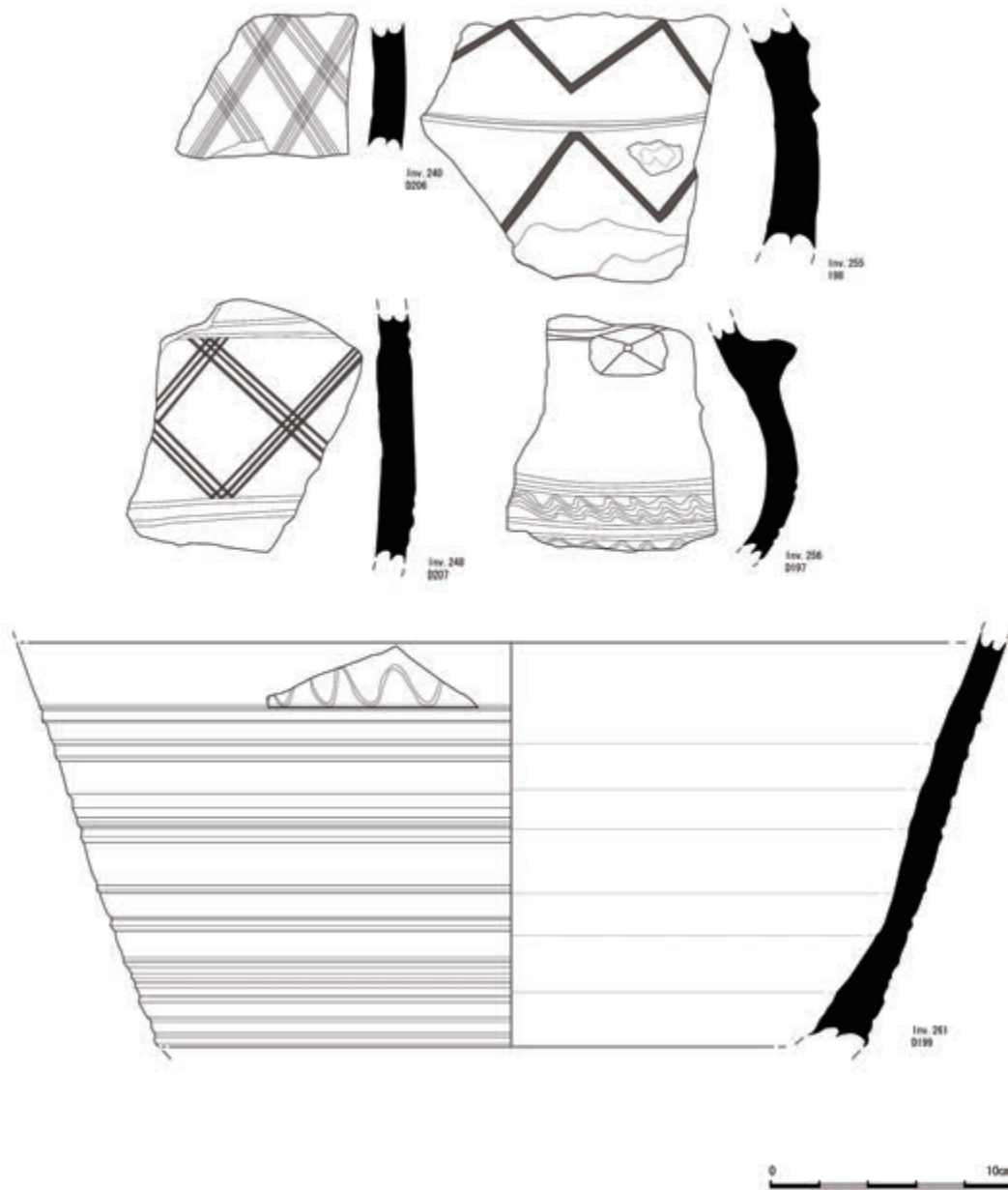


Fig. 48 Artifacts from Veal Trac Chour Kiln Site 1

Veal Trac Chour Kiln Site

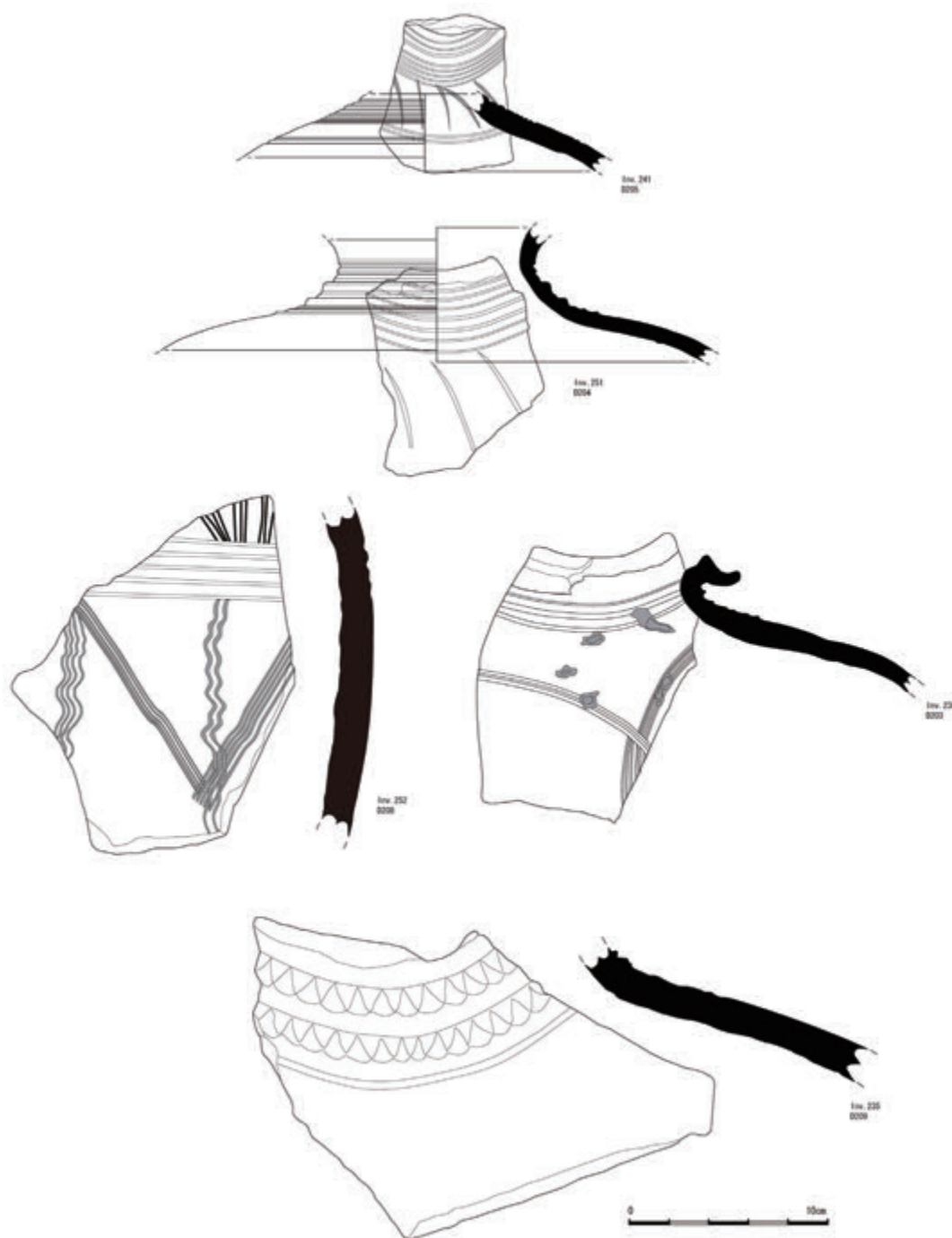


Fig. 49 Artifacts from Veal Trac Chour Kiln Site 2

Veal Trac Chour Kiln Site

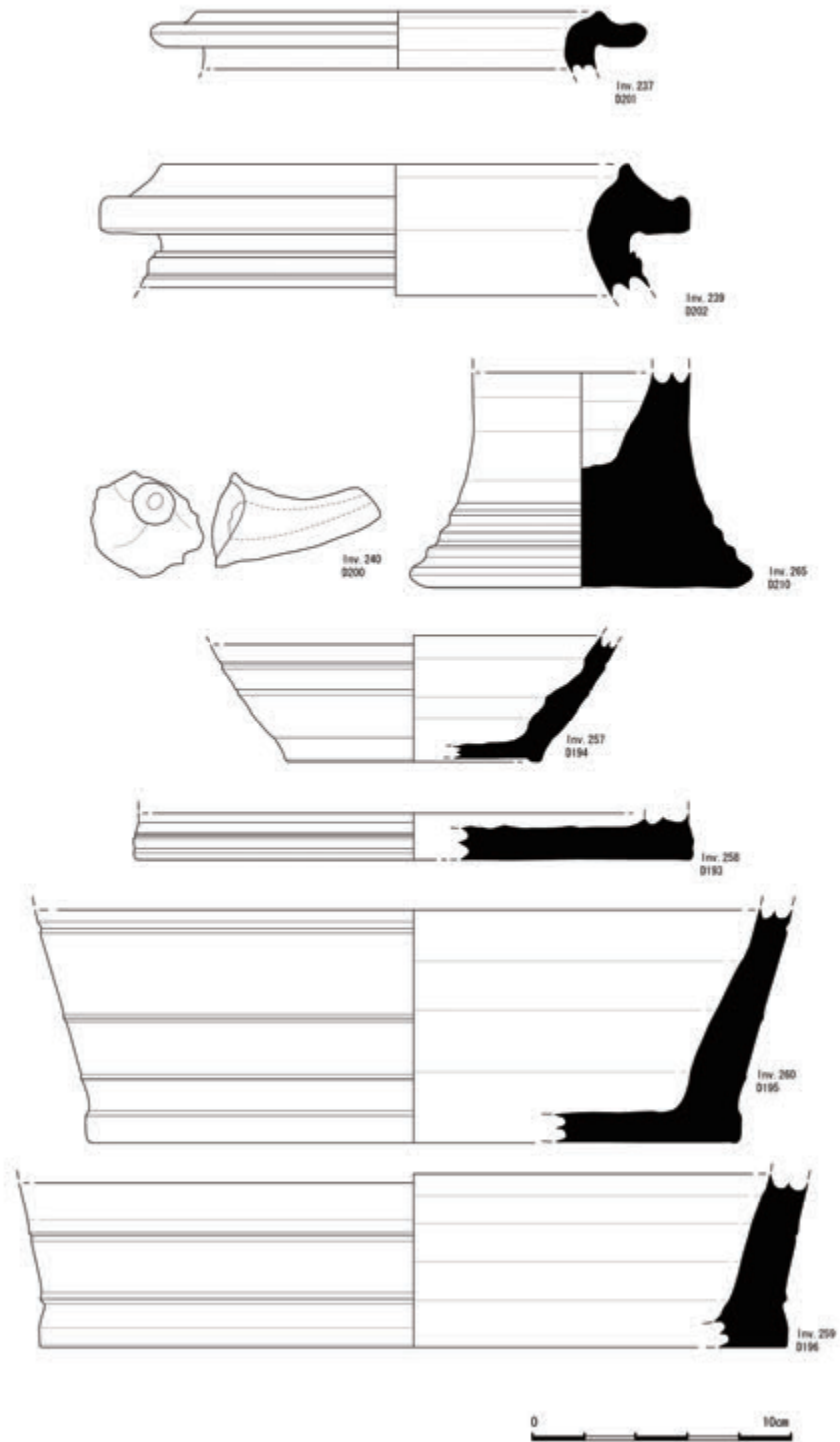


Fig. 50 Artifacts from Veal Trac Chour Kiln Site 3

Ceramic Fragments of Thlong A-Koang Site

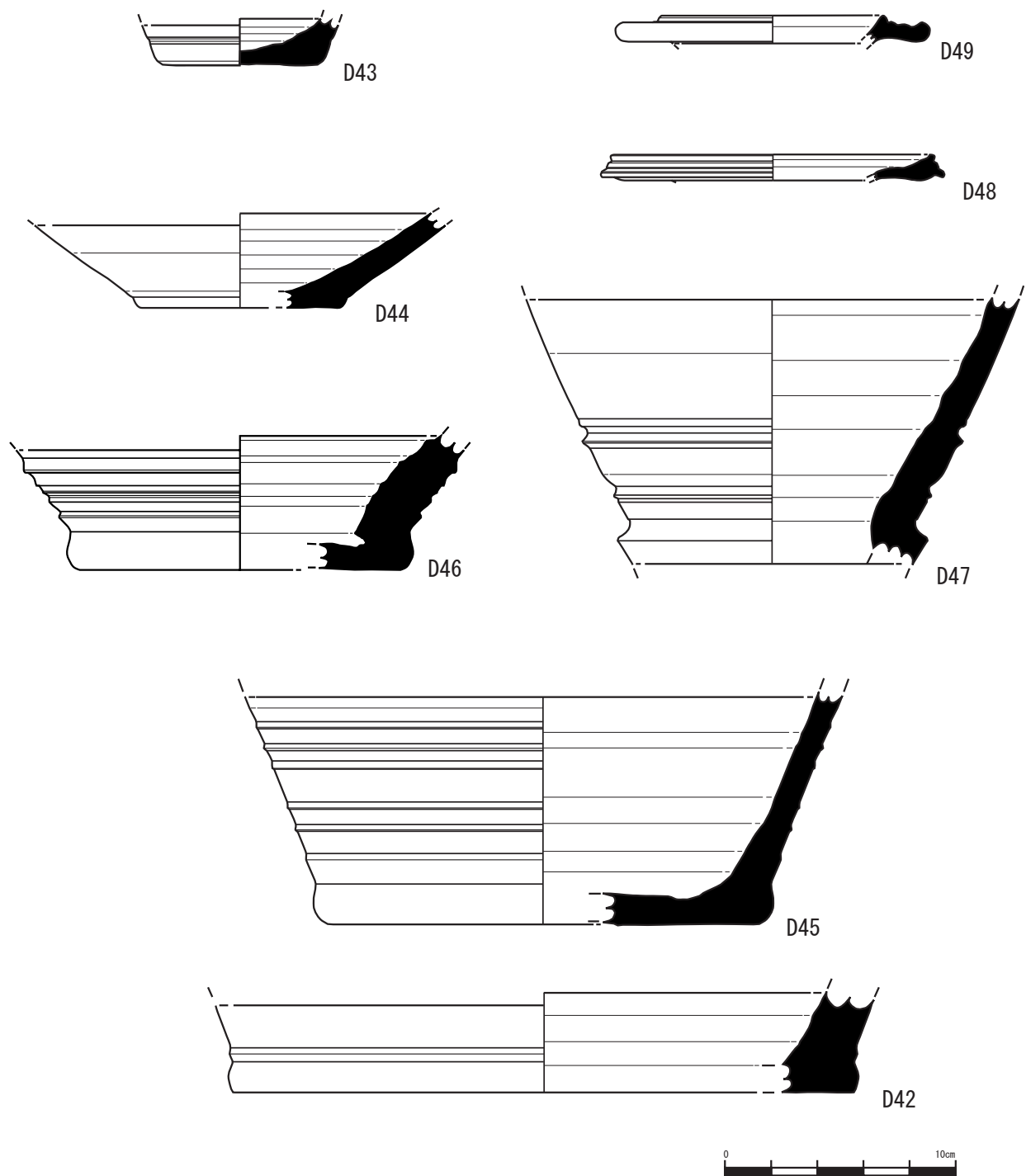


Fig. 51 Artifacts from Thlong A-Koang Site

Ceramic Fragments of Kok Chieng Mieng Site

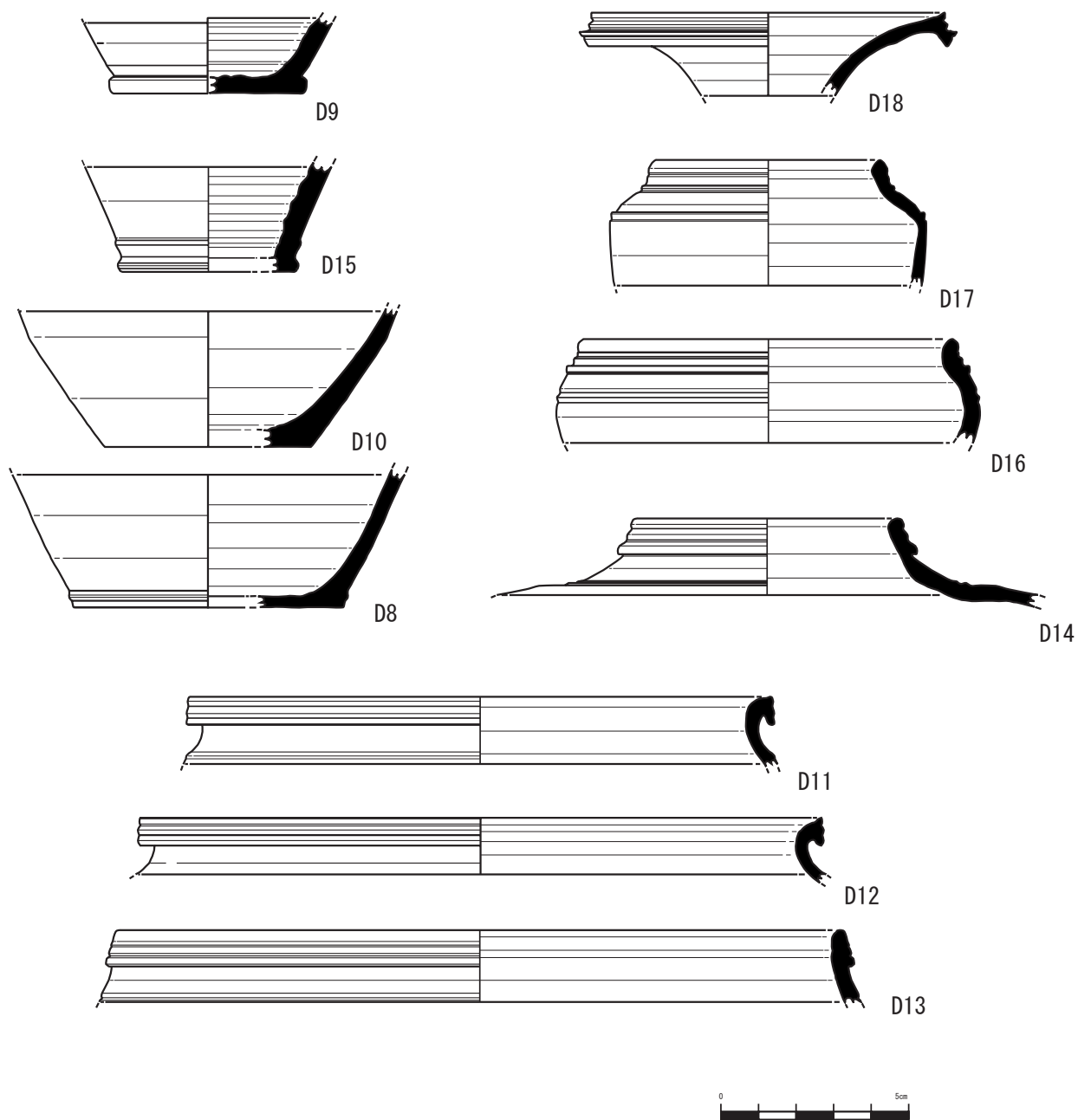


Fig. 52 Artifacts from Kok Chieng Mieng Site

Ceramic Fragments of Kok Dreal Site

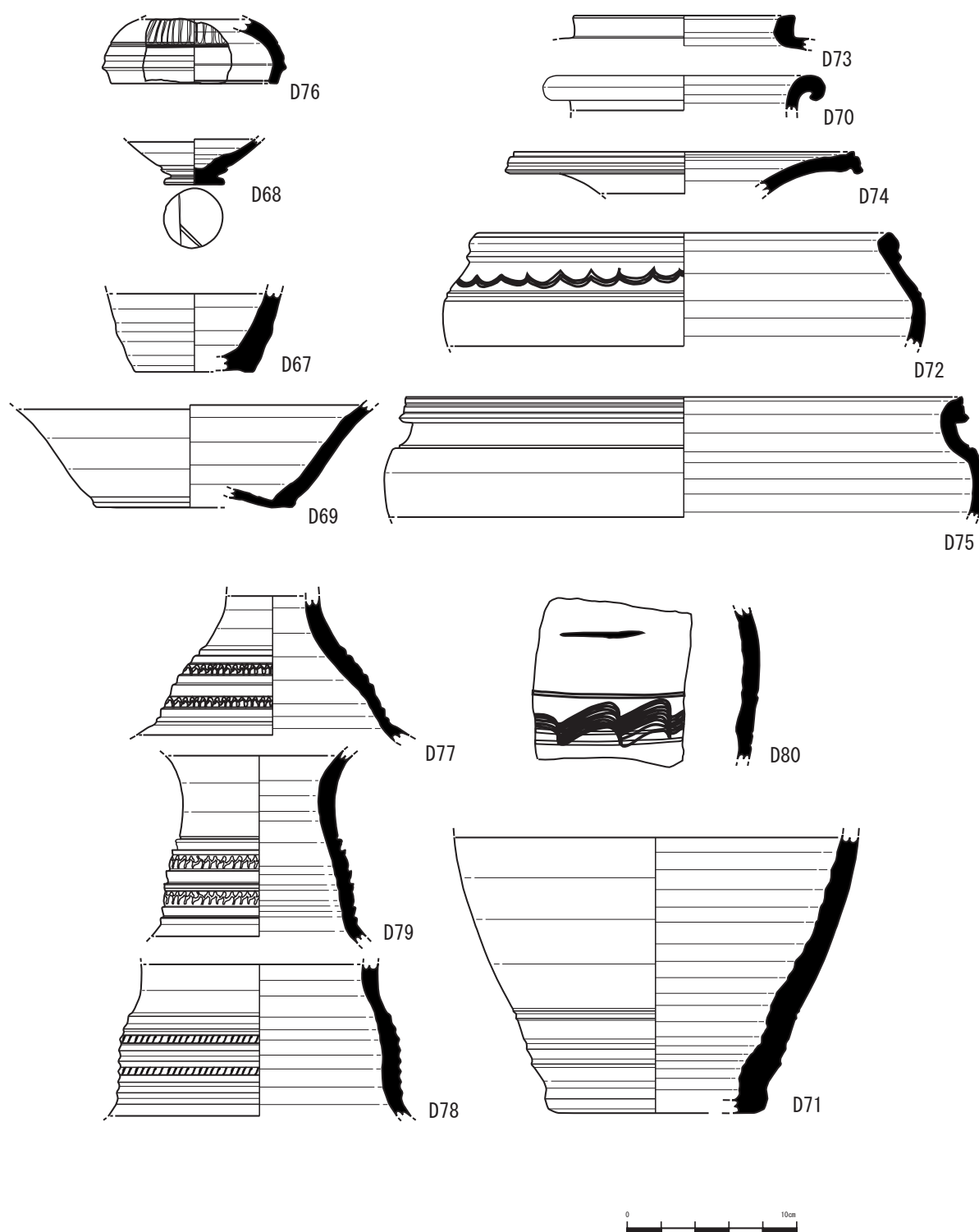


Fig. 53 Artifacts from Kok Dreal Site

Ceramic Fragments of Kok Khjeay and Kok Yay Degn Sites

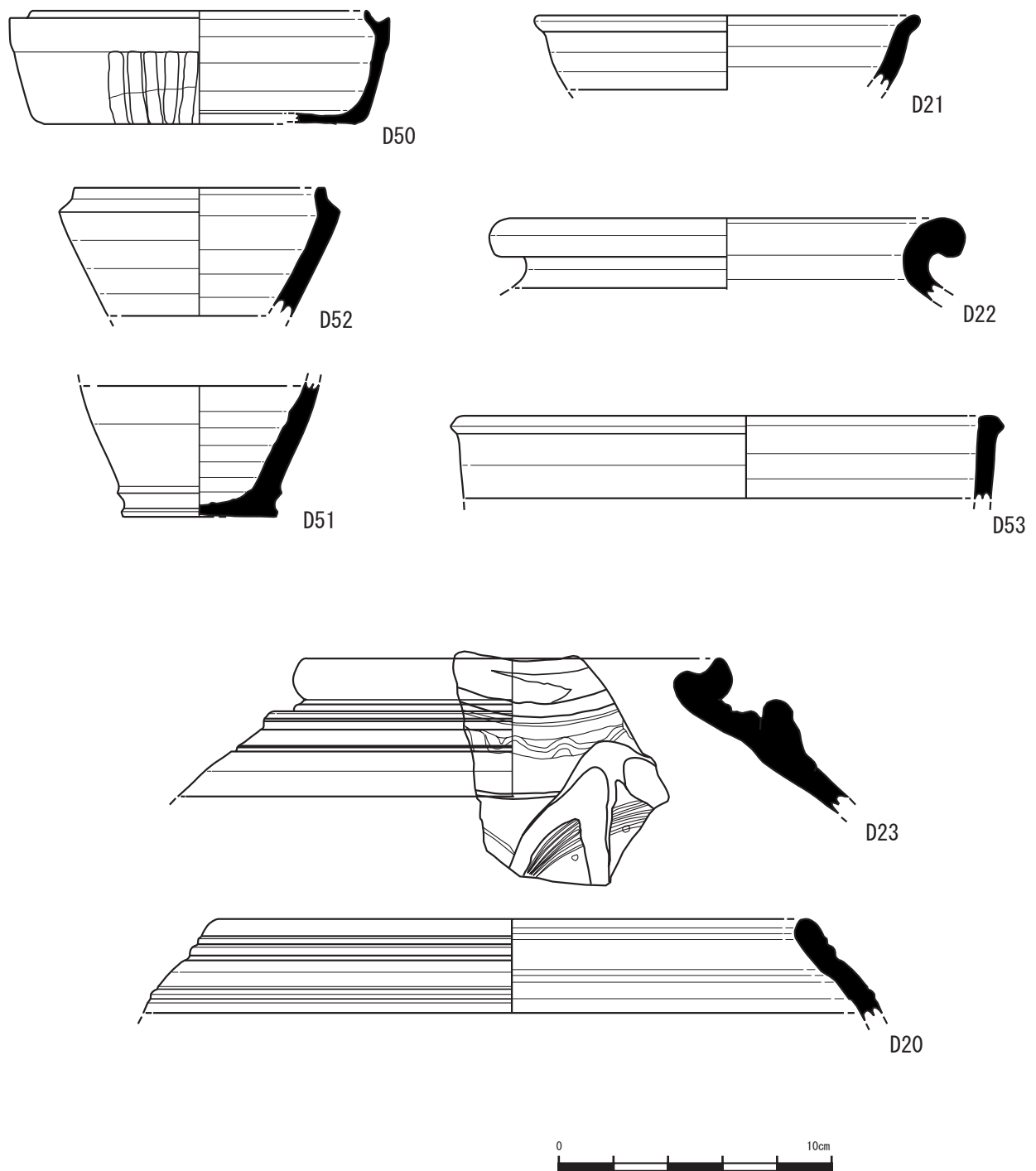


Fig. 54 Artifacts from Kok Khjeay and Kok Yay Degn Sites

Ceramic Fragments of Kok Khjeay Site

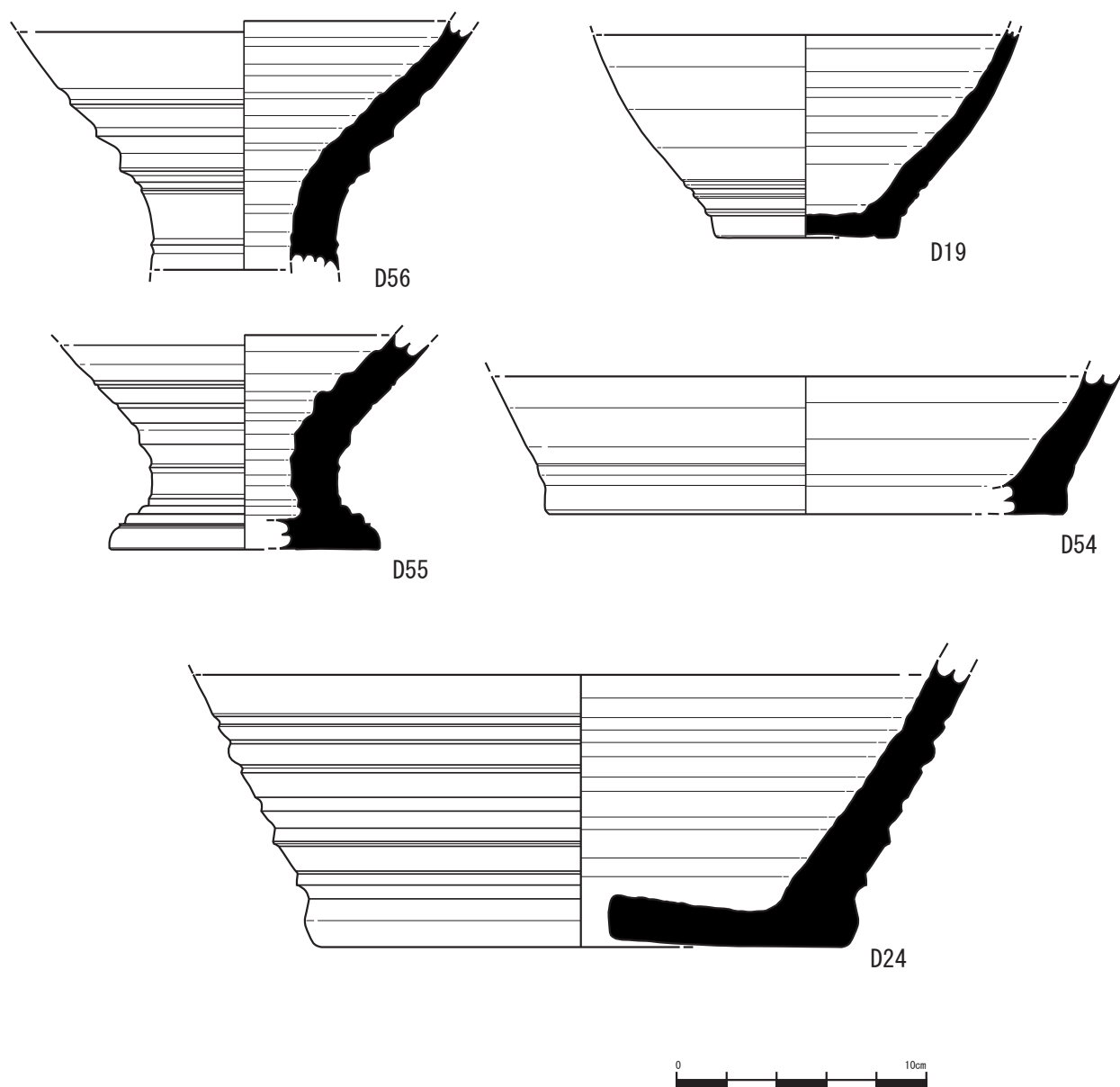


Fig. 55 Artifacts from Kok Khjeay site

Ceramic Fragments of Kok Yay Degn Site

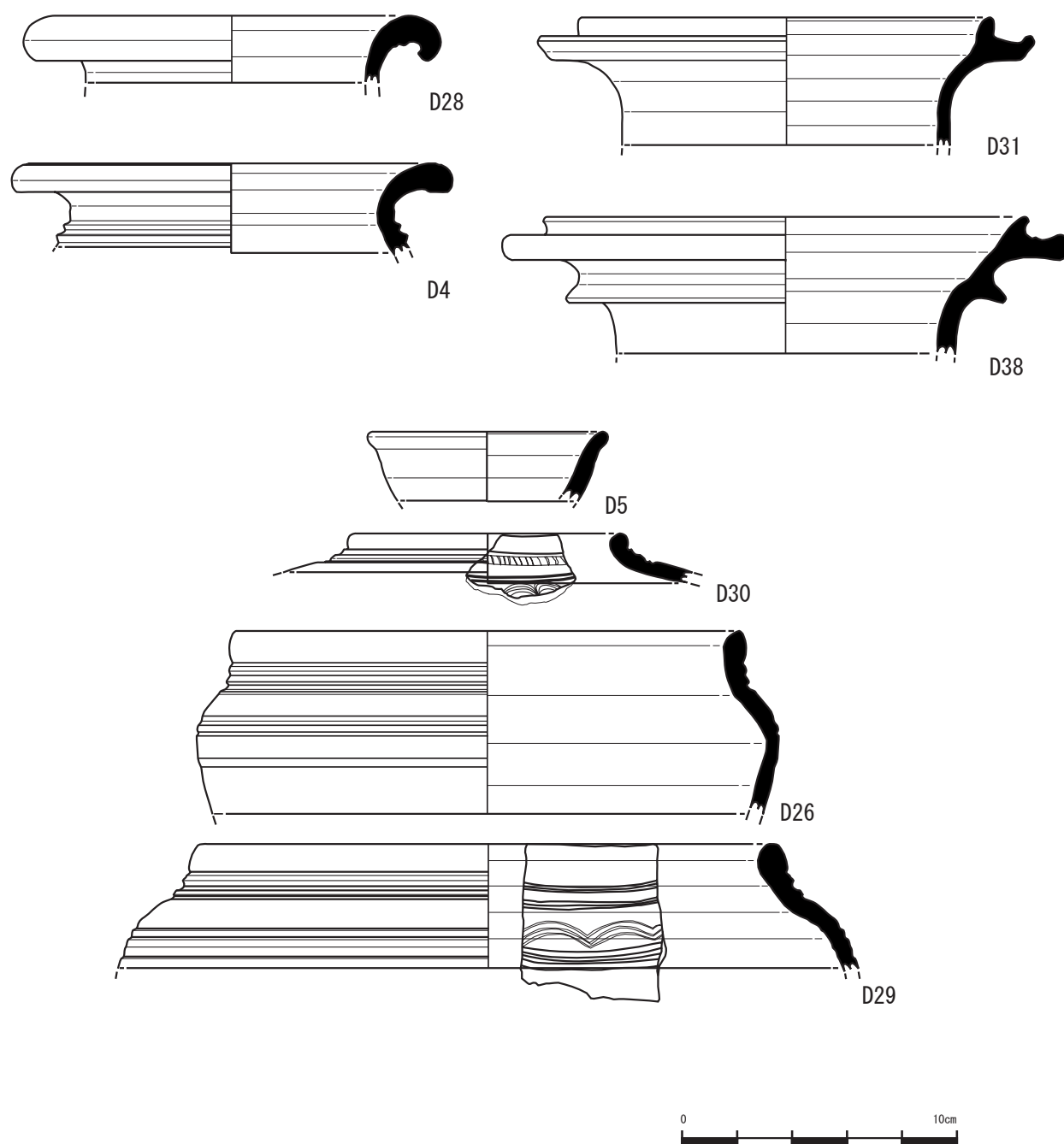


Fig. 56 Artifacts from Kok Yay Degn Site 1

Ceramic Fragments of Kok Yay degn Site

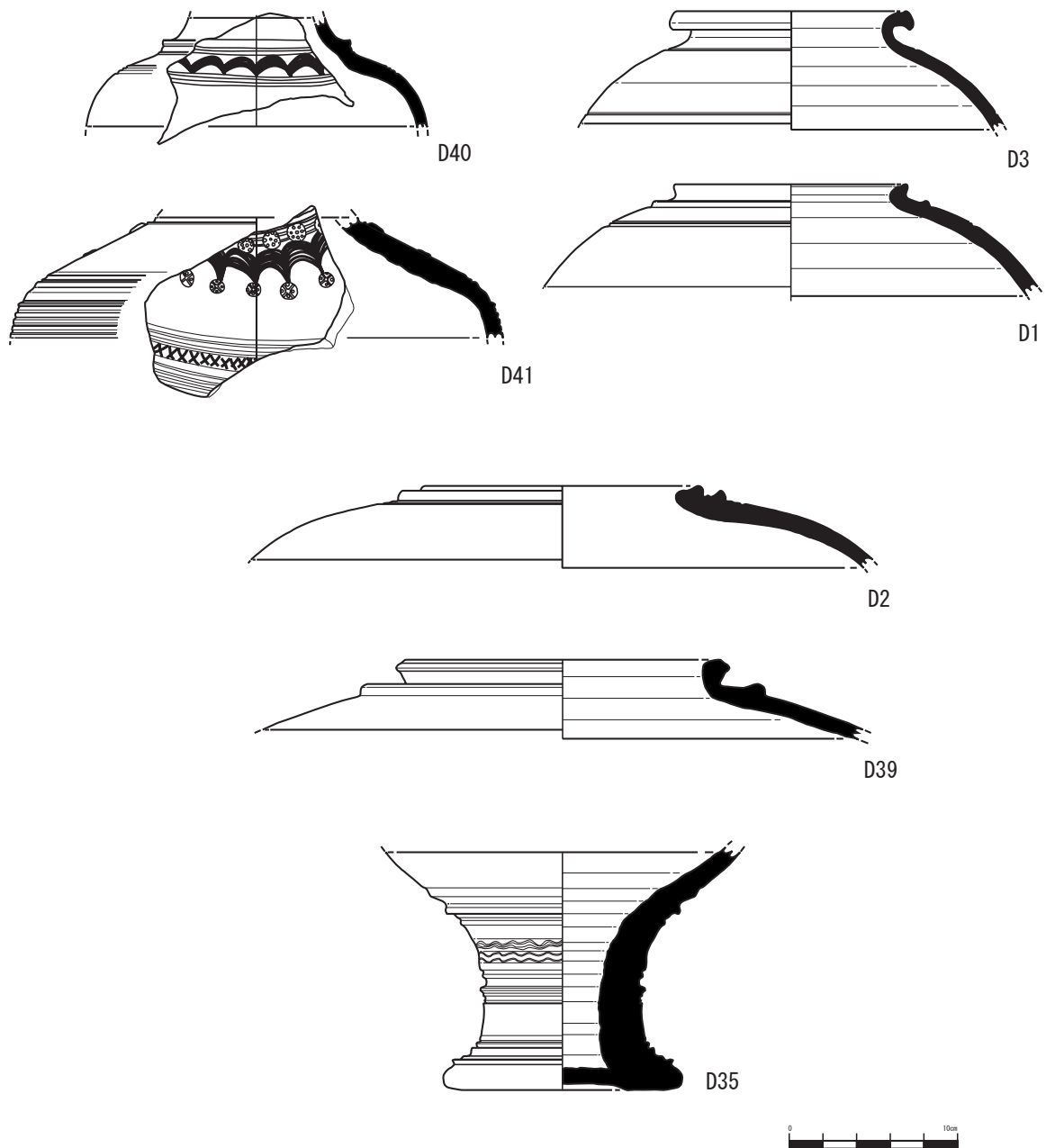


Fig. 57 Artifacts from Kok Yay Degn Site 2

Ceramic Fragments of Kok Yay Degn Site

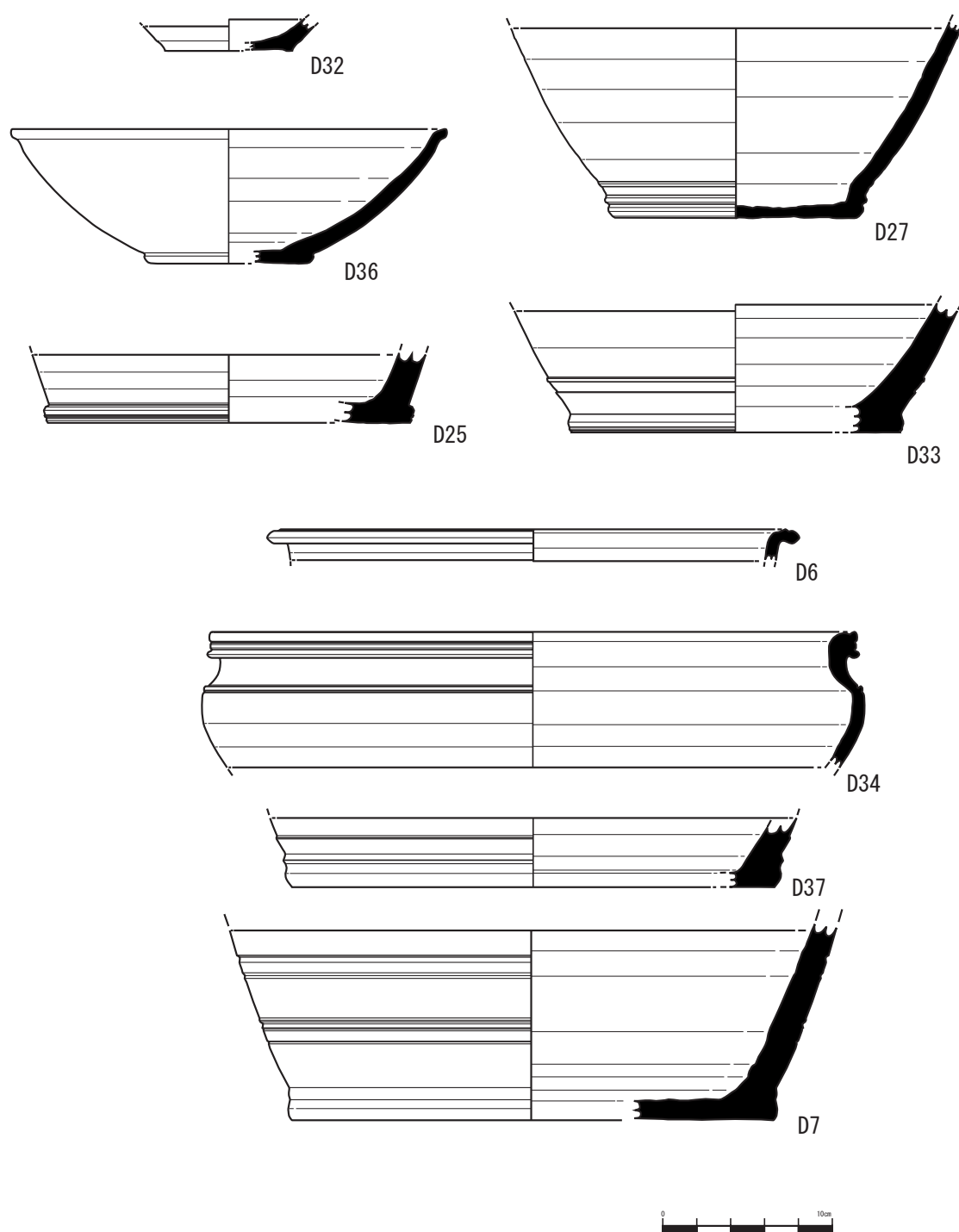


Fig. 58 Artifacts from Kok Yay Degn Site 3

Ceramic Fragments of Thlok Khtom Site

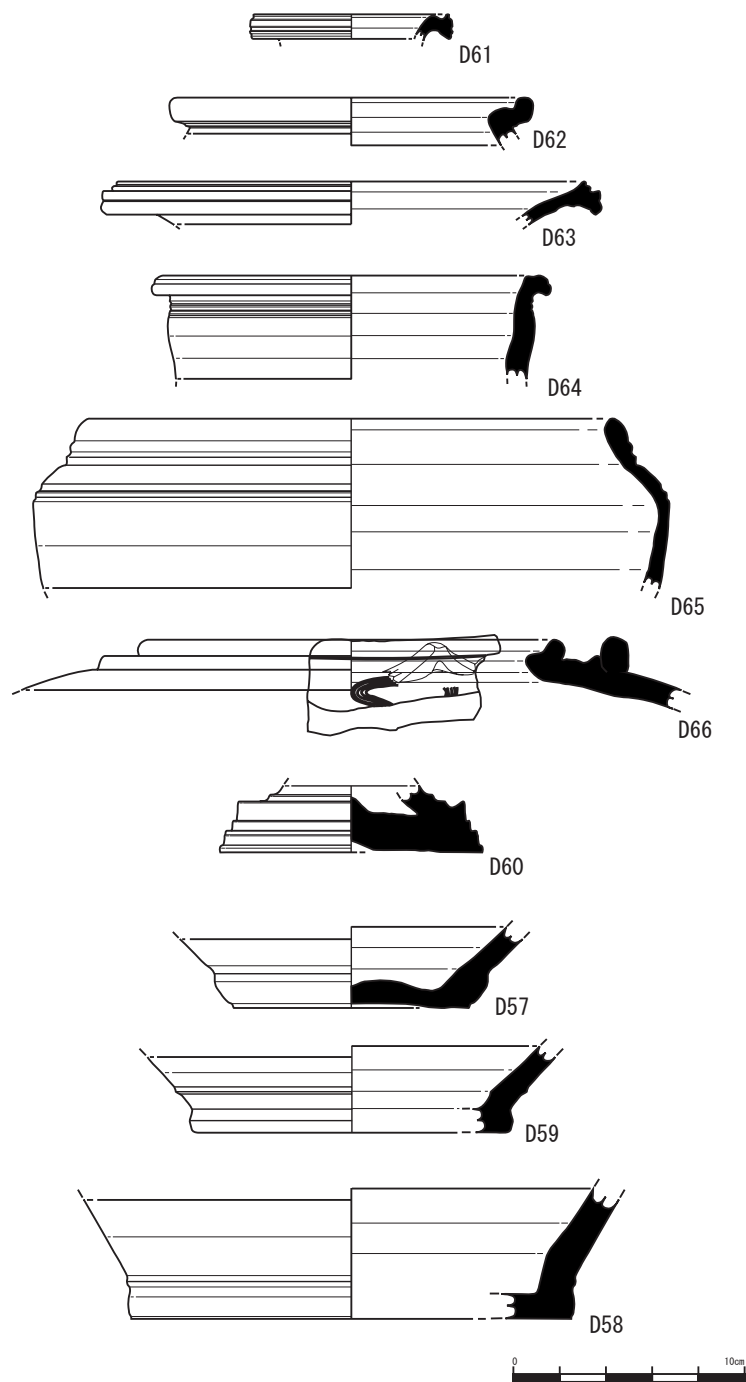


Fig. 59 Artifacts from Thlok Khtom Site 1

Ceramic Fragments of Thlok Khtom Site

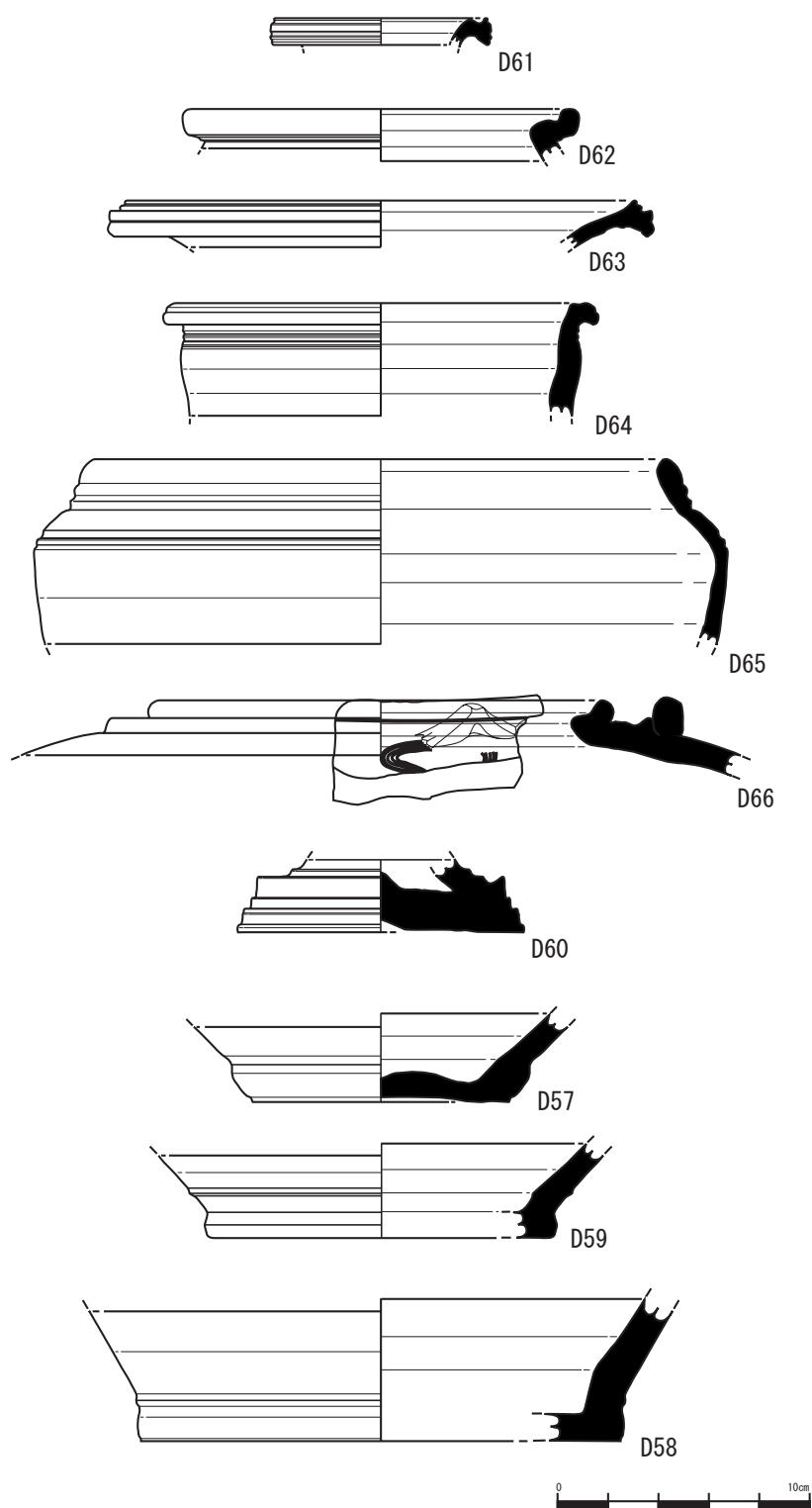


Fig. 60 Artifacts from Thlok Khtom Site 2

Ceramics of Angkor Borei Museum

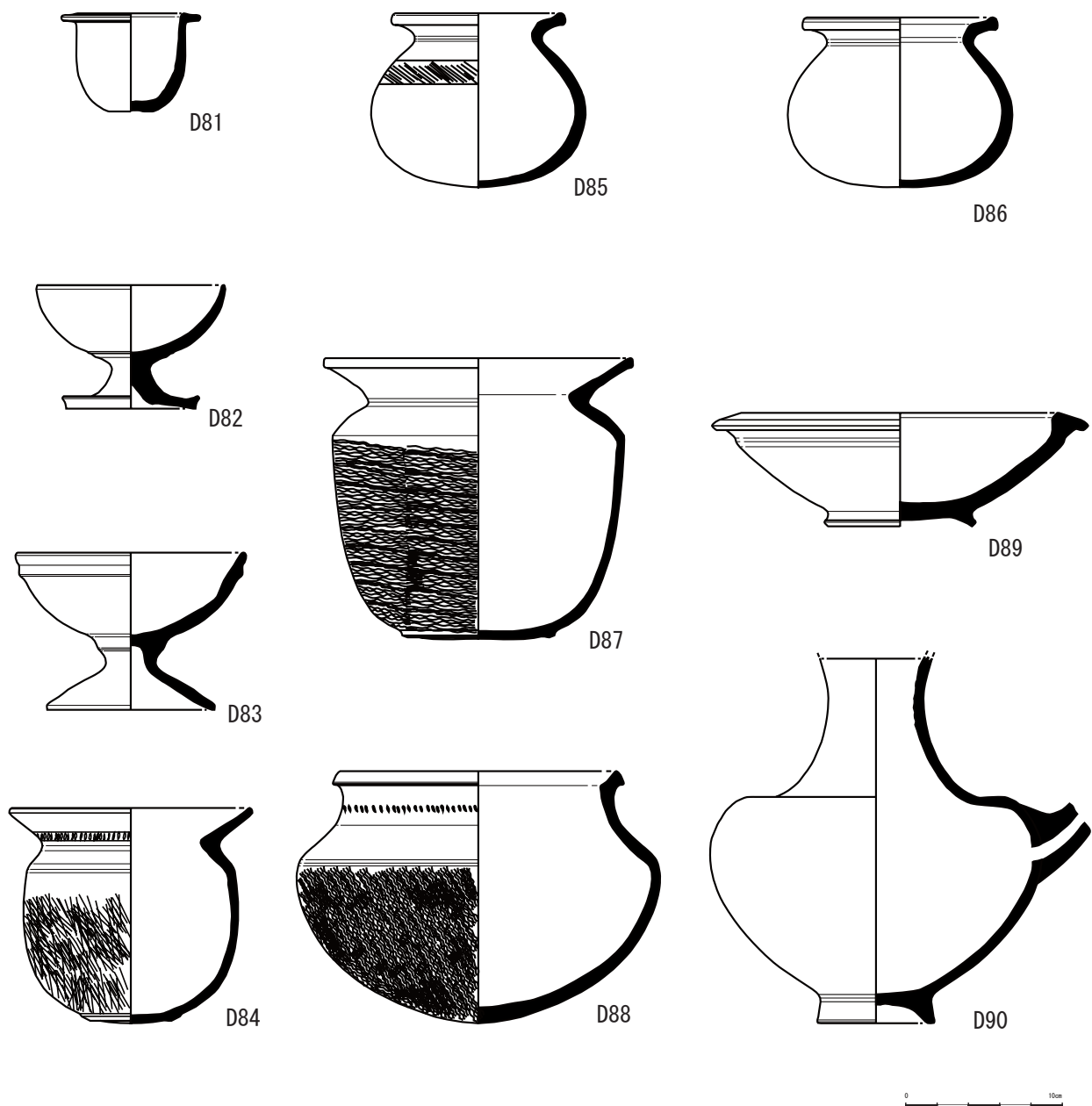


Fig. 61 Artifacts from Angkor Borei Museum