

Investigating trapezoidal plaquettes crafted from white-tailed deer bone at Cerro Juan Díaz (LS-3), Greater Coclé Culture Area (Panama)

Estudio de las plaquetas trapezoidales manufacturadas en hueso de venado cola blanca del Cerro Juan Díaz (LS-3), Área Cultural del Gran Coclé (Panamá)

Étude des plaquettes trapézoïdales en os de cerf de Virginie du site de Cerro Juan Díaz (LS-3), région culturelle de la Grande Coclé (Panama)

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Abstract: Cerro Juan Díaz (LS-3) is an archaeological site located on the coastal plains of Central Pacific Panama, near Parita Bay. Spanning approximately 200 ha, the site was occupied from 300 BC to 1600 AD and features distinct zones, including mortuary areas, middens, residential structures, and workshops for crafting bone and marine shell artifacts. Notably, white-tailed deer (*Odocoileus virginianus*) bones and antlers were utilized as raw materials for tools and ornaments. Among the site's remarkable discoveries are 13 flat, trapezoidal bone plaquettes, measuring between 2.5 cm and 3.5 cm, often perforated and predominantly associated with burial contexts. Their presence in tombs suggests symbolic or ritual roles, possibly linked to social status, group identity, or ceremonial practices. However, some plaquettes may also have served as everyday items, such as garment fasteners, before being deposited in funerary contexts. This study investigates the characteristics of these plaquettes, including manufacturing techniques and use-wear patterns, and explores parallels at other archaeological sites in Panama, shedding light on their functions and cultural significance.

Keywords: Cerro Juan Díaz, white-tailed deer, plaquette, perforation, mortuary context, intermediate area, Late Ceramic Period.

Resumen: Cerro Juan Díaz (LS-3) es un sitio arqueológico ubicado en las llanuras costeras del Pacífico central de Panamá, junto a la bahía de Parita. Con una extensión de 200 ha, este sitio estuvo habitado entre el 300 a.C. y el 1600 d.C. Se han identificado diversas zonas, como espacios mortuorios, basureros, unidades residenciales y talleres de fabricación de herramientas y adornos elaborados en hueso de venados de cola blanca principalmente y conchas marinas. Entre los hallazgos más relevantes se encuentran 13 plaquetas planas de forma trapezoidal, de 2,5 cm a 3,5 cm, frecuentemente perforadas. Estas plaquetas se encuentran mayormente en contextos funerarios, lo que sugiere que podían tener un significado ritual relacionado con el estatus o la identidad de sus portadores. Sin embargo, no se descarta que algunas hayan sido objetos de uso cotidiano, por ejemplo, como cierres de prendas, y que posteriormente fueran depositadas en tumbas. Este trabajo tiene como objetivo profundizar en el proceso de fabricación de estas

plaquetas, analizando las huellas de uso. Además, esta investigación busca identificar elementos análogos en otros sitios arqueológicos de Panamá, con el fin de desentrañar las funciones de estos artefactos.

Palabras clave: Cerro Juan Díaz-Venado de cola blanca, Plaqueta, Perforación, Contexto funerario, Área intermedia, Periodo cerámico tardío.

Résumé : Cerro Juan Díaz (LS-3) est un site archéologique du Panama situé dans les plaines côtières du Pacifique central, près de la baie de Parita. S'étendant sur 200 ha, il a été occupé entre 300 av. J.-C. et 1600 apr. J.-C. Plusieurs zones y ont été identifiées, comprenant des espaces funéraires, des dépotoirs, des unités résidentielles et des ateliers de production d'outils et d'ornements en os et en coquillages marins. Un des aspects les plus remarquables de ce site est l'exploitation des matières dures d'origine animale, notamment l'os et le bois de cerf de Virginie (*Odocoileus virginianus*), pour la fabrication d'outils et d'ornements. Cette pratique témoigne non seulement d'une expertise dans la transformation des matières d'origine biologiques, mais aussi d'un lien étroit entre les habitants de Cerro Juan Díaz et leur environnement naturel. Parmi les découvertes les plus significatives figurent 13 plaquettes plates de contour trapézoïdal, mesurant de 2,5 cm à 3,5 cm, souvent perforées. Ces plaquettes semblent avoir joué un rôle central dans la culture matérielle du site, et leur présence dans des contextes funéraires soulève des questions quant à leur éventuelle fonction rituelle et symbolique. Ces objets pourraient avoir servi à indiquer le prestige ou un statut social particulier, à signifier l'appartenance à un groupe ou d'éléments de rites funéraires à connotation spirituelle. Il est également possible que certaines plaquettes aient eu un usage quotidien, comme attaches de vêtements ou d'ornements, avant d'avoir été déposées dans les tombes.

L'étude présentée ici propose une description détaillée de ces plaquettes afin de mieux comprendre leur importance sociale et culturelle. La méthodologie repose sur l'analyse des traces techniques de fabrication et d'usure. Pour l'étude, des empreintes des surfaces ont été réalisées avec du silicone dentaire haute résolution (polysiloxane vinylique, Provil Novo Light), puis un tirage de moulages transparents en résine époxy. Bien que l'analyse des microstructures n'ait pas été effectuée, l'examen des traces d'usure permet d'identifier des indices d'utilisation antérieure au dépôt funéraire.

Cette recherche s'inscrit dans le cadre d'un projet plus large visant à repérer des artefacts similaires sur d'autres sites panaméens, afin de mieux comprendre certaines pratiques culturelles régionales. La comparaison des plaquettes de Cerro Juan Díaz avec celles d'autres contextes archéologiques permet d'établir des liens entre communautés et de saisir les réseaux sociaux et commerciaux ayant existé à cette époque. Les résultats enrichissent non seulement la connaissance de la culture matérielle locale, mais apportent aussi un éclairage sur les pratiques funéraires et les croyances religieuses des sociétés anciennes du Panama.

En conclusion, l'étude des plaquettes de Cerro Juan Díaz offre un aperçu précieux des pratiques culturelles de la région et de leur rôle dans les rituels funéraires. L'analyse de leur fabrication et de leur usage contribue à mieux comprendre l'identité sociale et culturelle des habitants du site ainsi que leur interaction avec l'environnement. Cette recherche fournit ainsi des éléments essentiels pour appréhender la complexité des sociétés précolombiennes du Panama et la manière dont elles intégraient leurs objets matériels dans la vie sociale et spirituelle.

Mots-clés : Cerro Juan Díaz, cerf de Virginie, plaquette, perforation, contexte funéraire, zone intermédiaire, période de céramique tardive.

INTRODUCTION

The interplay between humans and their environment has long been a focal point of archaeological research, offering insights into subsistence strategies, cultural practices, and social organization. In the Pacific region of Panama, the white-tailed deer (*Odocoileus virginianus*) exemplifies this relationship, serving as both a vital resource and a cultural symbol for ancient communities. With its wide distribution and adaptability to diverse ecosystems (Eisenberg, 1989; Emmons, 1999), including the wooded savannahs of the Holocene, this species became central to the lifeways of pre-Columbian societies in Parita Bay (Cooke and Ranere, 1992; Cooke et al., 2008). From its role in dietary practices and population management at preceramic sites like Cerro Mangote (Martínez-Polanco et al., 2020) to its integration into rituals (Martínez-Polanco and Cooke, 2019), craft production (Cooke et al., 2008; Martínez-Polanco et al., 2021), and artistic representation during the Gran Coclé Period (Cooke and Jiménez-Acosta, 2010; Cooke, 2011),

the white-tailed deer holds a unique place in Panama's archaeological record.

At Cerro Juan Díaz (LS-3), a site reflecting nearly two millennia of continuous occupation (fig. 1), the importance of deer is further illuminated through its use in tool-making, midden contexts and ceremonial contexts (Cooke and Sánchez Herrera, 1997; Cooke et al., 1998). Excavations at this ecotone settlement have revealed a rich tapestry of subsistence activities, burial traditions, and evidence of increasing social complexity (Carvajal-Contreras, 1998; Jiménez-Acosta and Cooke, 2001; Cooke et al., 2007, 2008 and 2013; Dickau, 2010). Among the notable artefacts uncovered are bone plaquettes, whose intricate manufacturing processes and use-wear patterns could provide valuable insights into the cultural and functional significance of these objects, as it offers direct evidence of how these artefacts were utilized, shedding light on their roles within daily practices, symbolic activities, or broader cultural traditions. This study examines the plaquettes of Cerro Juan Díaz in detail, situating them within a broader archaeological framework of similar artefacts found across Panama to

better understand their function and the cultural narratives they convey.

1. MATERIALS AND METHODS

1.1. Cerro Juan Díaz (LS-3): Operation 4 (OP.4)

Operation 4, conducted by Kolchi Udagawa and L. A. Sánchez between 1997 and 1998 at the Cerro Juan Díaz site, uncovered occupation spanning 650-1200 CE. Excavations in OP.4-A and OP.4-B revealed diverse mortuary practices, including primary flexed

burials, secondary burials in urns, and bundled remains in collective pits. Artifacts such as marine shell items (*Spondylus* and *Pinctada mazatlanica*) and “Initial Style” goldwork were documented, alongside layers of domestic refuse, small shell middens, ash deposits, paleosols, and burned clay floors. Despite their proximity, OP.4-A (5×7 m) and OP.4-B (7×6 m) displayed significant differences in stratigraphy and burial characteristics, with 77 features identified, including 50 burial contexts (fig. 1). Stratigraphic and ceramic analysis, supplemented by radiocarbon dating, provided insights into funerary practices of the Late Ceramic Period (700-1300 CE; Díaz, 1999).

According to C. Díaz (1999), the OP.4 platform was utilized for two distinct cemetery types: zones for group

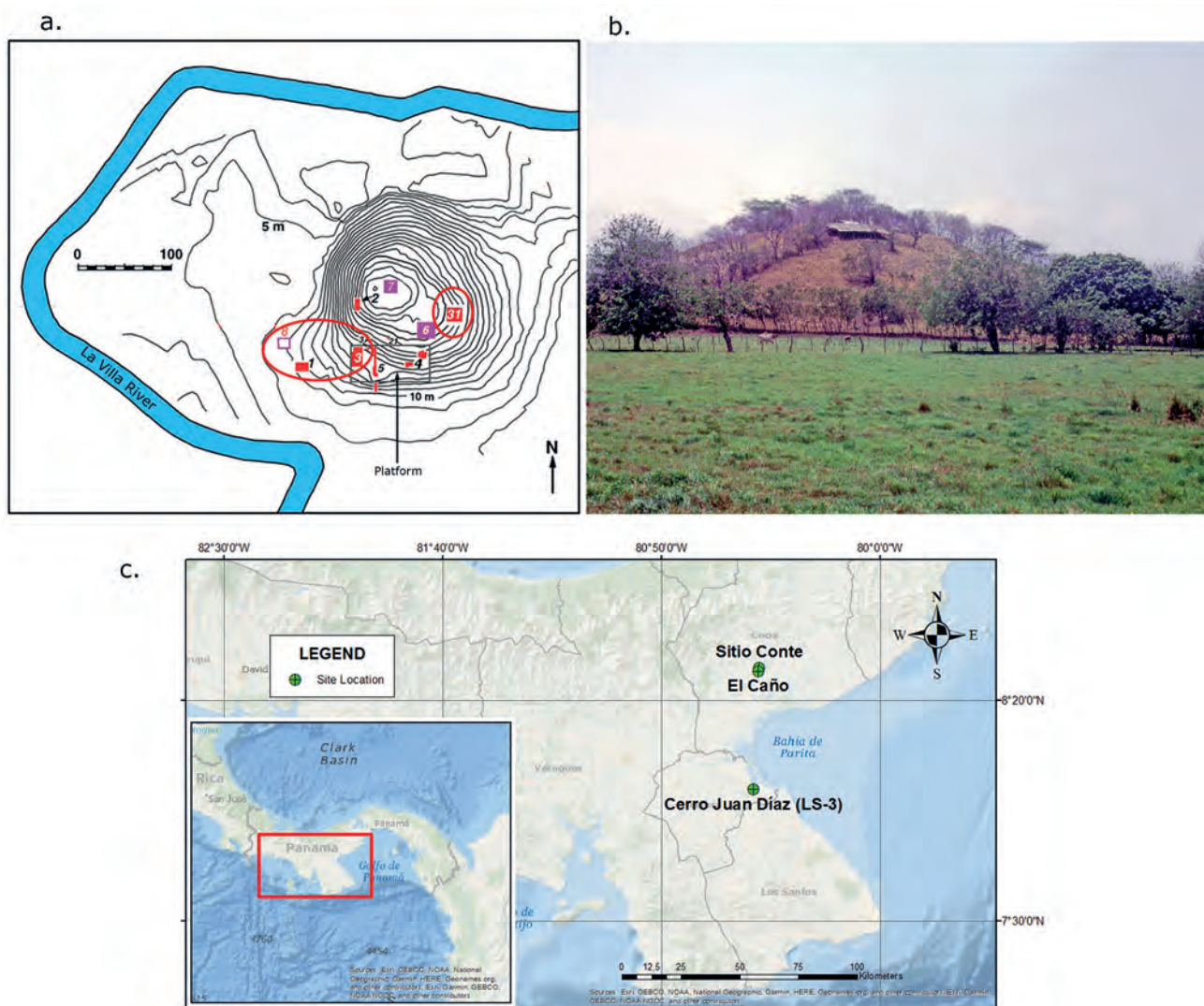


Fig. 1 – a) Operations location at Cerro Juan Díaz: Operation 1/1B is located at the southwest corner of the archaeological site near Operation 4, Operation 8, Operation 5 and Operation 3; operation 31 is located at the northeast part of the Cerro (after Cooke and Sánchez Herrera, 1997). b) View of Cerro Juan Díaz (photo R. Cooke, 1994). c) Cerro Juan Díaz (LS-3), Sitio Conte and El Caño geographical location.

Fig. 1 – a) Localisation des opérations à Cerro Juan Díaz. L'opération 1/1B est située dans le coin sud-ouest du site archéologique, à proximité des opérations 4, 8, 5 et 3. L'opération 31 est située dans la partie nord-est du Cerro (d'après Cooke et Sánchez Herrera, 1997). b) Vue de Cerro Juan Díaz (cliché R. Cooke, 1994). c) Localisation géographique de Cerro Juan Díaz (LS-3), Sitio Conte et El Caño.

inhumations and dedicated mortuary spaces with reused niches. Communal graves often included at least one primary burial and multiple secondary deposits in urns or ossuaries placed on the tomb floor or walls. Evidence of repeated tomb reopening, such as articulated bones in ossuaries or incomplete primary burials, suggests that many skeletons later placed in ossuaries were the graves' initial occupants. Group A tombs consisted of shallow, simple individual graves averaging 0.6 artefacts per burial, primarily utilitarian items and non-artefactual offerings like food remains. In contrast, Group B tombs were deeper, more elaborate, and richer in artefacts, averaging 3.7 items per individual, including ceramic vessels (48%), gold beads, and stone tools, indicating higher social or ceremonial status (Díaz, 1999).

The analysis of key burials from Operation 4 highlights significant variability in mortuary practices during the Late Ceramic Period (700-1300 CE). Graves 1, 43, 48 and 54 exemplify distinct burial arrangements and offerings. Grave 1 featured a circular pit with three phases of deposition, including a funerary urn containing a neonate with a red plate, an adult flexed burial associated with stone artefacts, and an ossuary with eight rearranged individuals. Grave goods included stone tools, bone and ceramic beads, and a gold foil fragment (Díaz, 1999). Grave 43, the most extensive, reached a depth of 1.85 m and contained approximately 12 individuals in sequential layers: a large urn with a neonate, four stacked primary flexed burials, and seven secondary ossuaries. Ritual elements were evident in clay or ash "beds" beneath some burials, alongside offerings such as polychrome vessels and gold beads. In contrast, Grave 48, a simpler pit burial, contained a single urn with disarticulated bones and modest offerings, including a small polychrome plate, pendants made of bone and animal teeth, and a stone tool. Grave 54 displayed greater complexity, featuring two large ceramic vessels, a trichrome pot containing an infant, two flexed burials, and five secondary burials. Artefacts from Grave 54 included metate fragments, a tumbaga chisel, shark tooth pendants, and various stone tools, reflecting its multifaceted nature. Together, these graves underscore the interplay of ritual, status, and cultural identity in the funerary practices of the region (Díaz, 1999).

1.2. Operation 3 (OP.3), Operation 5 (OP.5) and Operation 8 (OP.8)

Operation 3 involved the excavation of a 12x20 m area on an artificial platform located on the southern slope of the Cerro Juan Díaz archaeological site. Conducted between 1992 and 1995 by L. Sánchez, I. Isaza, A. Pérez and A. Badilla, this operation primarily focused on burial features, providing critical insights into mortuary practices and regional interactions during the Middle Ceramic Period (Sánchez, 1995; Cooke et al. 1998; here fig. 1).

The earlier burial group (Middle Ceramic) from OP.3 yielded artefact assemblages rich in shell ornaments,

some typologically similar to the plaque-like objects described in this paper, including Features 1, 2, 16 and 94 (Cooke et al., 1998). Burials contemporary with the shell ornament workshop found in Operation 8 also provide evidence of bone artefacts, overlapping with the later part of the Middle Ceramic (D) and possibly the Late Ceramic A (Mayo, 2004).

Several contexts from the later part of OP.3 and OP.4, as well as those from the La Cañaza phase in the southern Azuero Peninsula (Ichon, 1980), exhibit notable similarities. Among these are flexed burials such as T.41 and T.68, which contained grave goods including shell pendants shaped as fangs and ceramic vessels of the La India Rouge type. These vessels, featuring orange slips with purple designs, closely align with artifacts from the La Cañaza phase (pre-900 CE, uncalibrated) in the southern Azuero Peninsula (Ichon, 1980). The presence of ash deposits within these tombs further underscores their typological connection to La Cañaza burial traditions, highlighting shared cultural practices across the region. Secondary urn burials also emerged as a significant feature, linking Operation 3 with patterns observed in nearby excavations (fig. 1). Additionally, Operation 5 (Tomb 3) contained secondary burials, further illustrating the mortuary complexity of the Middle and Late Ceramic Periods, as reflected in the diversity of burial practices and their continuity over time.

The excavations carried out at the base of the hill in 1992 and 1994 (Operations 1 and 1B) revealed evidence of domestic occupation in this sector, which was further confirmed in the 2001 season when a workshop for the production of ornaments was discovered (OP.8). This workshop is contemporary with multiple funerary features detected, primarily in OP.3. Operation 8 was initiated at the base of Cerro Juan Díaz, near Operation 1. Spanning 38 m², the excavation uncovered a thin layer, just over 35 cm thick, situated directly beneath the humic stratum (fig. 1). Chronologically, this layer corresponds to Rasgo 1 of Operation 1. The area represents a segment of an extensive midden-workshop, yielding ceramic fragments—predominantly of the Cubitá style—along with faunal remains, lithic tools, and shell debris. Some of the shells were used to produce beads, typologically similar to those found in the grave goods of certain burials at the site. Notably, the excavation revealed Rasgo L, a mortuary feature with three burial phases, all looted and associated with Conte-style ceramics. Two distinct tombs were also documented: Tumba 5, which predates the midden's deposition, and Tumba 4, a shallow intrusive burial of an infant in an extended position, resembling "late" burials identified in other operations (Mayo, 2004).

1.3. Materials

At Cerro Juan Díaz, 13 bone plaquettes have been recovered from various excavation operations (table 1; fig. 2): OP.3 (2), OP.4 (5), OP.5 (2), OP.7 (1), OP.8 (1), and OP.31 (2). Based on their size, thickness, and shape, the raw material is most likely derived from white-tailed



Fig. 2 – Bone plaquettes found at Cerro Juan Díaz (LS-3; photos M. Guillén).
Fig. 2 – Plaquettes en os découvertes à Cerro Juan Díaz (LS-3 ; clichés M. Guillén).

Code	Operation	Context information	
H-022	3		
H-024	3	T-78	
H-201	3	T 68	Ind. 19
H-105	4	T-43	
H-118	4	T-1	
H-126	4	T-48	
H-129	4	T-54	Ind. 111
H-130	4	T-43	Ind. 65
H-561	5		
H-567	5		
H-196	7		
H-824	8		
H-271	31		
H-700	31		

Table 1 – Contextual information of the bone plaquettes found at Cerro Juan Díaz (LS-3).
Tabl. 1 – Informations contextuelles des plaquettes en os découvertes à Cerro Juan Díaz (LS-3).

deer (*Odocoileus virginianus*) bone. Although ZooMS (Zooarchaeology by Mass Spectrometry) analysis has not been conducted to confirm this hypothesis, several lines of evidence support this attribution. White-tailed deer is the largest mammal inhabiting the region, and its bones are well-documented as raw material in Cerro Juan Díaz (Martínez-Polanco et al., 2021; Cooke, 2004a), making it an ideal candidate for producing relatively large and robust plaquettes. The dimensions and cortical thickness of the plaquettes are consistent with the skeletal elements of this species, and its frequent use for other bone tools and ornaments at the site further corroborates this interpretation. Morphologically, the plaquettes are generally flat, elongated, and trapezoidal. They were crafted from bone, not antler. Working antler would have been considerably more challenging and time-consuming due to the different mechanical and structural properties of the raw material. Unlike bone, which fractures predictably and can be split into flat surfaces, antler has a denser and more fibrous composition that resists controlled breakage. It must therefore be sawn, rasped, or ground rather than fractured, requiring additional labor and specialized tools. Moreover, the branched and irregular morphology of white-tailed deer antlers offers few straight sections suitable for producing elongated plaquettes. For these reasons, antler requires a distinct *chaîne opératoire* involving selection of specific segments, intensive abrasion, and prolonged polishing, whereas bone can be worked more efficiently through direct fracture and simple shaping. These technical constraints would make it unlikely for antler plaquettes to be produced systematically or in a standardised “chain” fashion, as appears to have been the case with the bone examples from Cerro Juan Díaz.

Of the 13 plaquettes, seven were recovered from burials (OP.3 and OP.4), while the remaining six were found in other contexts, including midden deposits and non-funerary features. For this study, we examined 10 specimens—those available at the Catalan Institute of Human Paleoeology and Social Evolution (IPHES) in Tarragona, Spain—originating from OP.3, OP.4, OP.5, and OP.7, and exported under permits issued by the Dirección Nacional de Patrimonio Histórico in Panama (Resolution No. 324-18 DNPH). The remaining three plaquettes could not be analyzed: three are curated at the Smithsonian Tropical Research Institute (STRI) in Panama.

1.4. Methods

To characterize these plaquettes, several measurements were taken, including maximum and minimum length, width, thickness, hole diameter, and the distance between perforations (when applicable).

First, moulds of the bone plaquettes surfaces were created with high-resolution dental silicone (vinyl polysiloxane; Provil Novo Light, regular set). Prior to moulding, the surfaces of each plaquette were cleaned using acetone, followed by 96% ethanol. Transparent casts were subsequently produced using clear epoxy resin (CTS EPO 150). The resulting casts were analysed with

a stereomicroscope (Zeiss Stemi 2000-C) under transmitted light at the Catalan Institute of Human Paleoeology and Social Evolution (IPHES) in Tarragona, Spain. This method offers a significant advantage over working directly with an opaque surface, as the transparency and the refractive properties of the casts, combined with transmitted light enables the detailed observation of microfeatures in use-wear traces, such as internal microstriations (Camarós et al., 2016; Micó et al., 2024).

2. RESULTS

The measurements of the trapezoidal bone plaquettes found at Cerro Juan Díaz reveal significant variability in their dimensions and features, indicating diverse functions or cultural meanings. Lengths (Length 1 and Length 2) range from 15 mm (H-022) to 37.05 mm (H-201) and widths between 9.8 mm (H-022) and 27.2 mm (H-561). Thickness is more consistent, ranging from 2.6 mm (H-105) to 3.8 mm (H-126). The variation in thickness may be related to the choice of bone and the specific part selected for manufacturing the plaquettes. The shape and size of the perforations suggest a standardized operational sequence in the crafting process. The presence of one or two perforations in most plaquettes, with perforation diameters varying from 2.0 mm (H-196) to 4.8 mm (H-201), suggests that these artefacts were designed for suspension or attachment purposes possibly as ornaments (table 2; fig. 2). Plaquettes with a single hole, such as H-022, H-024, H-105, and H-126, display a design distinct from those with multiple perforations (fig. 2). The hole diameters range from 2.1 mm to 3.1 mm, dimensions that would allow the passage of a cord or thread for suspension. While their exact function remains uncertain, the careful shaping and, in some cases, surface finishing suggest that they may have been intended for visible display, possibly serving both practical and symbolic or status-related purposes.

Plaquettes with multiple holes, such as H-118 and H-567, show distances between perforations ranging from 5.2 mm to 10.9 mm (table 2). The variability in spacing suggests that the positioning of the holes was not standardized but may have been guided by functional needs—such as accommodating specific attachment methods—or by aesthetic considerations in the object's overall appearance. In contrast, some plaquettes, like H-130 and H-561, lack perforations or additional design features, indicating alternative uses or possibly representing unfinished artefacts (fig. 2).

The plaquettes generally exhibit striations on their upper surfaces, with edges carefully rounded and polished. Their perforations are circular with a cylindrical profile, maintaining a consistent diameter along their length, and sometimes show fine concentric striations indicative of drilling with a pointed tool. Slight rounding and polish along the perforation edges suggest repeated contact with a cord or similar attachment, and cut marks occa-

Code	Length 1	Length 2	Width	Thickness	Hole 1 Length	Hole 1 Width	Hole 2 Length	Hole 2 Width	Distance Between Holes
H-022	15.70	15.00	9.80	2.90	2.20	2.20	-	-	10.90
H-024	17.20	10.70	14.60	2.90	-	-	2.40	2.30	-
H-105	22.70	14.20	12.90	2.60	2.10	2.20	-	-	-
H-118	30.30	16.60	15.50	3.00	2.20	2.10	2.30	2.30	5.20
H-126	36.60	19.70	10.30	3.80	3.10	3.00	-	-	-
H-129	24.70	16.10	13.40	3.50	2.40	2.80	-	-	-
H-130	26.30	13.10	13.50	2.90	-	-	-	-	-
H-201	37.05	19.70	14.20	3.50	4.00	4.80	-	-	-
H-196	36.40	18.00	10.50	2.90	2.00	2.00	1.90	2.00	10.20
H-561	30.80	27.20	13.50	3.10	2.30	2.20	-	-	-
H-567	31.10	22.20	12.60	3.10	2.30	2.20	2.30	-	9.70
Mean	28.08	17.50	12.80	3.11	2.51	2.61	2.23	2.20	9.00
SD	7.48	4.60	1.86	0.35	1.17	1.32	1.13	1.03	4.76
Min	15.70	10.70	9.80	2.60	2.00	2.00	1.90	2.00	5.20
Max	37.05	27.20	15.50	3.80	4.00	4.80	2.40	2.30	10.90

Table 2—Measurements and morphological characteristics of bone plaquettes from Cerro Juan Díaz.

Tabl. 2 – Mesures et caractéristiques morphologiques des plaquettes en os de Cerro Juan Díaz.

sionally appear near the holes (fig. 2). Plaquette H-201 exemplifies these traits, combining precise manufacture with wear traces that, while not conclusive evidence of symbolic or decorative use, gain significance from their presence in burial contexts—supporting the idea that such objects may have formed part of ornaments, such as necklaces, and carried symbolic meaning within the cultural practices of Cerro Juan Díaz.

Plaquette H-561 features a single, well-crafted hole positioned at the centre of the piece. Notably, the lower right portion of the plaquette is broken. One of its distinguishing characteristics is the presence of two deep incisions extending from the broken corner towards the hole in a transverse direction. Additionally, parallel incisions along the distal edge of the plaquette are clearly visible. Another notable feature is the rounded edge at the upper part of the artefact, further emphasizing its careful preparation and craftsmanship (fig. 3).

DISCUSSION AND CONCLUSIONS

The variability in dimensions and design underscores the potential for the plaquettes to serve diverse roles, ranging from utilitarian tools to symbolic or ritual items. The consistent use of bone as raw materials highlights the community's skill in crafting and suggests a cultural emphasis on these materials in both daily and ceremonial practices. This is evident at OP.1B, where deer were not only consumed but also utilized as raw materials in a workshop dedicated to crafting bone and antler items (Martínez-Polanco et al. 2021; Martínez-Polanco, 2025). While

deer bone ornaments were commonly found as offerings in selected graves at Sitio Conte and Playa Venado, they were less prevalent at Cerro Juan Díaz (Briggs, 1989; Cooke, 2004a; Cooke and Jiménez-Acosta, 2010).

It appears that the plaquettes were produced by artisans at Cerro Juan Díaz and, in some cases, placed in burial sites both within and outside the settlement. At Cerro Juan Díaz, plaquettes have been recovered from funerary contexts in OP.3 and OP.4 (Cooke, 2004b). These contexts span a range of burial types, indicating that their deposition was not limited to a single funerary tradition. Although worked bone debris has been documented in the OP.1B workshop area, no manufacturing waste can be directly linked to plaquette production. The workshop deposits and the burials containing plaquettes are broadly contemporary within the Middle Ceramic Period, supporting the interpretation that local production was possible even if direct manufacturing evidence remains absent. An alternative possibility is that some plaquettes functioned as everyday objects—particularly as clothing fasteners or ornaments—that were not restricted to funerary contexts, with certain examples later incorporated into burial assemblages. The variability in their archaeological contexts suggests that plaquettes may have been adapted to different functions and practices, though their exact role in each case remains uncertain.

It is notable that the plaquettes appear individually, and not all of them have holes. This excludes the possibility that they were used for the same purpose, despite their similarities. For example, their use as necklace beads can be ruled out in cases where no hole is present. Perhaps their shape itself is key to understanding their use. One hypothesis is that they could have functioned as toggles

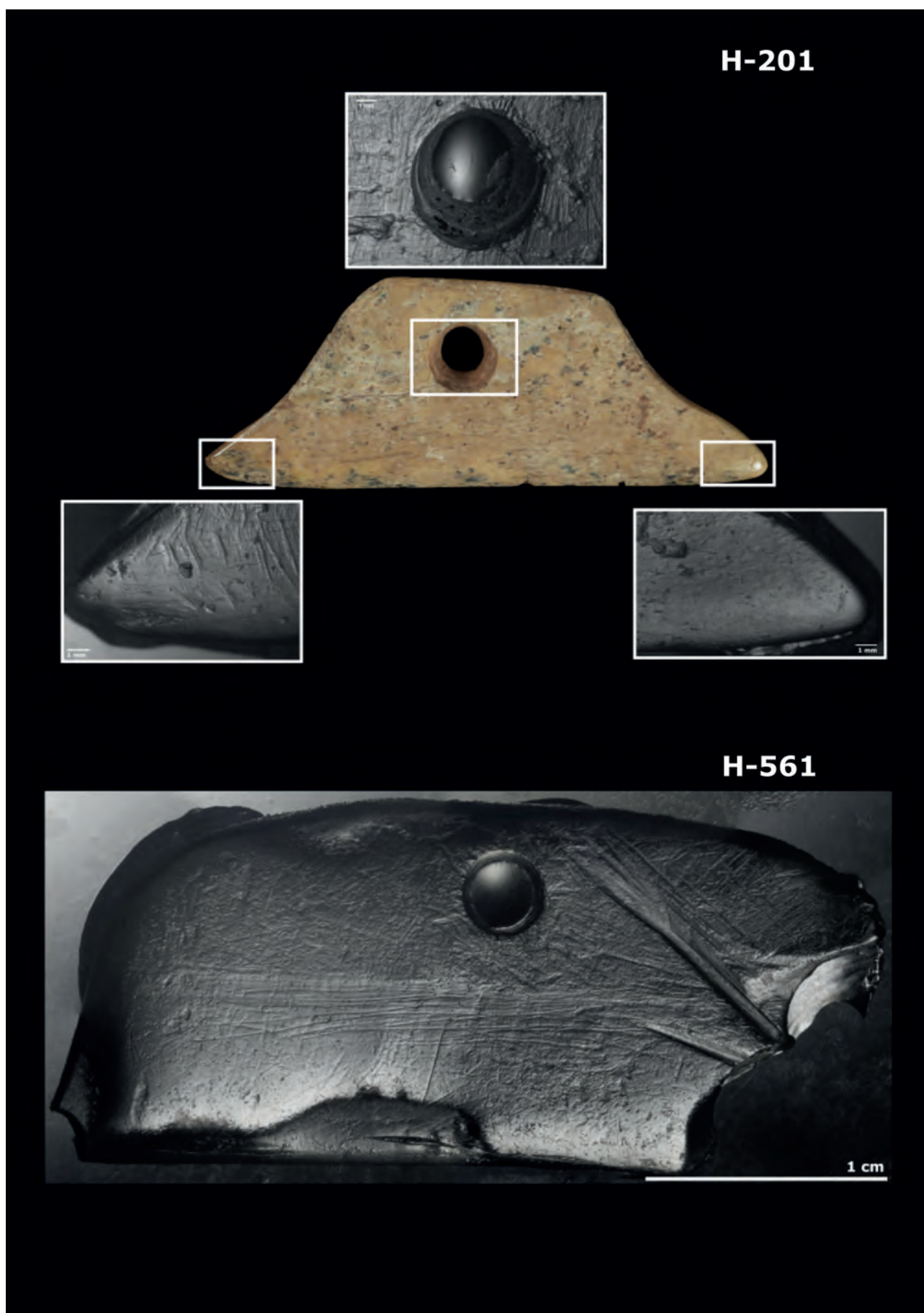


Fig. 3 – a. Plaque H-201, OP.3 (photos by M. Guillén and C. Micó). b. Plaque H-561, OP.5 (photo C. Micó).
Fig. 3 – a. *Plaquette H-201, OP.3* clichés M. Guillén et C. Micó). b. *Plaquette H-561, OP.5* (cliché C. Micó).

for fastening garments. However, the exact position of the pieces within each context is unknown, so this remains a hypothesis.

These plaquettes are not exclusive to Cerro Juan Díaz; similar artifacts have been found at other archaeological sites, such as La Cañaza (500–900 AD; Ichon, 1980), Playa Venado (825–1024 cal CE; 1227–926 cal BP; Smith-Guzmán et al., 2021), El Caño (900–1020 cal CE; 1050–930 cal BP; Mayo and Mayo, 2013), and Sitio Conte (750–950 cal CE; Lothrop, 1937). The first two sites are associated with egalitarian funerary contexts, while El Caño and Sitio Conte are characterized as high-ranking burial sites. At Playa Venado, small mammal bone plaques were crafted into trapezoidal and sub rectangular shapes. Some had drilled perforations, suggesting they were used as toggles for fastening garments, while unperforated versions may have been used as inlays (Smith-Guzmán et al., 2021, fig. 111). Similar artefacts were recorded at La Cañaza (Ichon, 1980, fig. 87:1 and fig. 90:b), made from both bone and shell, with examples featuring nacreous finishes or matte white surfaces. At Sitio Conte, comparable items were classified as miscellaneous objects (Lothrop, 1937, fig. 197:b.). At El Caño, three trapezoidal bone beads with two perforations each were discovered in a burial as part of an individual's trousseau (UE:134; Subunit: I7), dated to 900–1020 cal AD (cal BP 1050–930). The excavators identified the material as fish teeth, specifically large-tooth sawfish (*Pristis perotteti*). They proposed that these beads served both ritual and ornamental purposes, likely functioning as components of necklaces and used as row separators. In Burial 4, additional sawfish denticle artefacts were discovered, dated to the Late Ceramic Period Phase B (cal AD 885–1015; cal BP 1065–935). Both artefacts are classified as ritual or ornamental objects. In Burial 2, another plaquette was found, described as a button made from a sawfish tooth. It features two perforations, likely used for threading fibres to attach it to garments. These artefacts further highlight the cultural and symbolic significance of sawfish teeth in ceremonial and functional contexts during the Late Ceramic Period.

In conclusion, the plaquettes from Cerro Juan Díaz and similar artifacts from other sites underscore their cultural significance and the diverse roles they may have served. While their presence across varied funerary and non-funerary contexts at Cerro Juan Díaz may suggest different uses, this variability does not necessarily imply distinct functions; the same type of object could have been employed in similar ways across settings. However, differences in features such as the presence or absence of perforations and variation in hole number and spacing raise the possibility that some plaquettes served distinct purposes—for instance, as clothing fasteners, ornamental elements, or other utilitarian items—before their eventual deposition in burials. The careful craftsmanship and variability in design suggest a deliberate adaptation for both symbolic and utilitarian purposes. Comparisons with artifacts from La Cañaza, Playa Venado, El Caño, and Sitio Conte reveal shared traditions and regional exchanges

during the last part of the Middle Ceramic and a good part of the Late Ceramic. These findings emphasize the interconnectedness of these communities and the importance of bone as materials in crafting objects for daily use, ornamentation, and ceremonial practices. The presence of these plaquettes within distinct social and funerary settings suggests that they were meaningful not only as functional items but also as markers of cultural identity and social structure.

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