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ABSTRACT

Insights into a First Millennium BC (800 – 400 cal BC) Social Network Excavations at Las Orquídeas in the Northern Ecuadorian Sierra

Eric Dyrdahl – Carlos Montalvo

Interregional interaction long has been a central theme in Ecuadorian archaeology. However, outside of a few studies from late prehispanic contexts, little evidence of craft production has been identified, with limited examples that relate to long-distance exchange. Excavations at Las Orquídeas, a Late Formative (800 – 400 cal BC) site located on the outskirts of the modern city of Ibarra, have recovered the most diverse array of crafting activities in prehispanic Ecuador. We present the first detailed examination of 278 m2 of excavations, documented contexts, and some important artifact classes (ceramics, obsidian, malacological remains) since our doctoral dissertations. We argue that the first millennium BC inhabitants of Las Orquídeas participated in a long-distance network that involved important social events in which exotic jewelry was exchanged. The population at Las Orquídeas obtained unworked non-local raw materials to craft distinctive jewelry and participate in the network.

KEYWORDS

Ecuador, First Millennium BC, craft production, social networks, malacology, ceramics, obsidian

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Introduction

1 The period known as the Late Formative (800 – 400 cal BC) represents an interesting moment in Ecuadorian archaeology. In a region that emphasizes the important role played by interregional interaction in its prehispanic societies (Zeidler 2008; Valdez 2008), the area that now constitutes the province of Imbabura and northern portion of Pichincha contains a unique variety of evidence of non-local goods during this period. Archaeological evidence of all of the following exotic materials has been identified: marine shell, exotic animal remains, obsidian, gold, non-local ceramics, greenstone axes, quartz crystals, and cotton (Athens 1990: 54-73; Athens 1995: 14-21; Stahl - Athens 2001: 166; Pearsall 2003: 220-221).

2 This variety of non-local evidence is all the more striking considering that it was found at a single site: La Chimba, located in the northwestern corner of the Pichincha province (Fig. 1) (Athens 1995: 6; Stahl - Athens 2001: 161). Until recently, no other site in the region had been studied in enough detail to confirm the presence of stratigraphy pertaining to the first millennium BC and serve as a point of comparison to La Chimba. This panorama changed in 2013 when, during the construction of a pair of sporting fields in neighborhood Las Orquídeas (San Antonio de Ibarra, Imbabura), a stratigraphic sequence of 4-5 m was exposed during the modification of the terrain.

3 This article serves as a general summary of the archaeological evidence from Las Orquídeas. After a brief examination of earlier relevant research, data related to stratigraphy, ceramics, obsidian, and marine shell (principally *Spondylus princeps* and *Pinctada mazatlanica*) are outlined. The discussed materials suggest that individuals living at Las Orquídeas not only acquired finished goods via exchange along both an east-west and north-south axis, but also obtained unworked raw material to craft a range of items, primarily adornments. This evidence demonstrates that La Chimba is not an isolated case of intense interaction. Instead, it appears that first millennium BC populations in the northern highlands arguably set the standard for interregional interaction throughout Ecuadorian prehistory, acquiring both finished exotic goods and non-local raw materials for crafting. Ultimately, we argue that an exchange network centered

on important social events was a key component of life in the northern Ecuadorian highlands between 800 – 400 cal BC.

Background

4 Las Orquídeas is part of the larger Los Soles area (Fig. 2) that long has been known for its rich archaeological record (Camino 1999; Echeverría 2004: 65; Valdez 2008: 873-875). Previous excavations at Los Soles documented materials pertaining to all three major ceramic periods (Formative, Regional Development, and Integration) in Ecuadorian archaeology, but no intact stratigraphy was uncovered (Camino 1999). It is

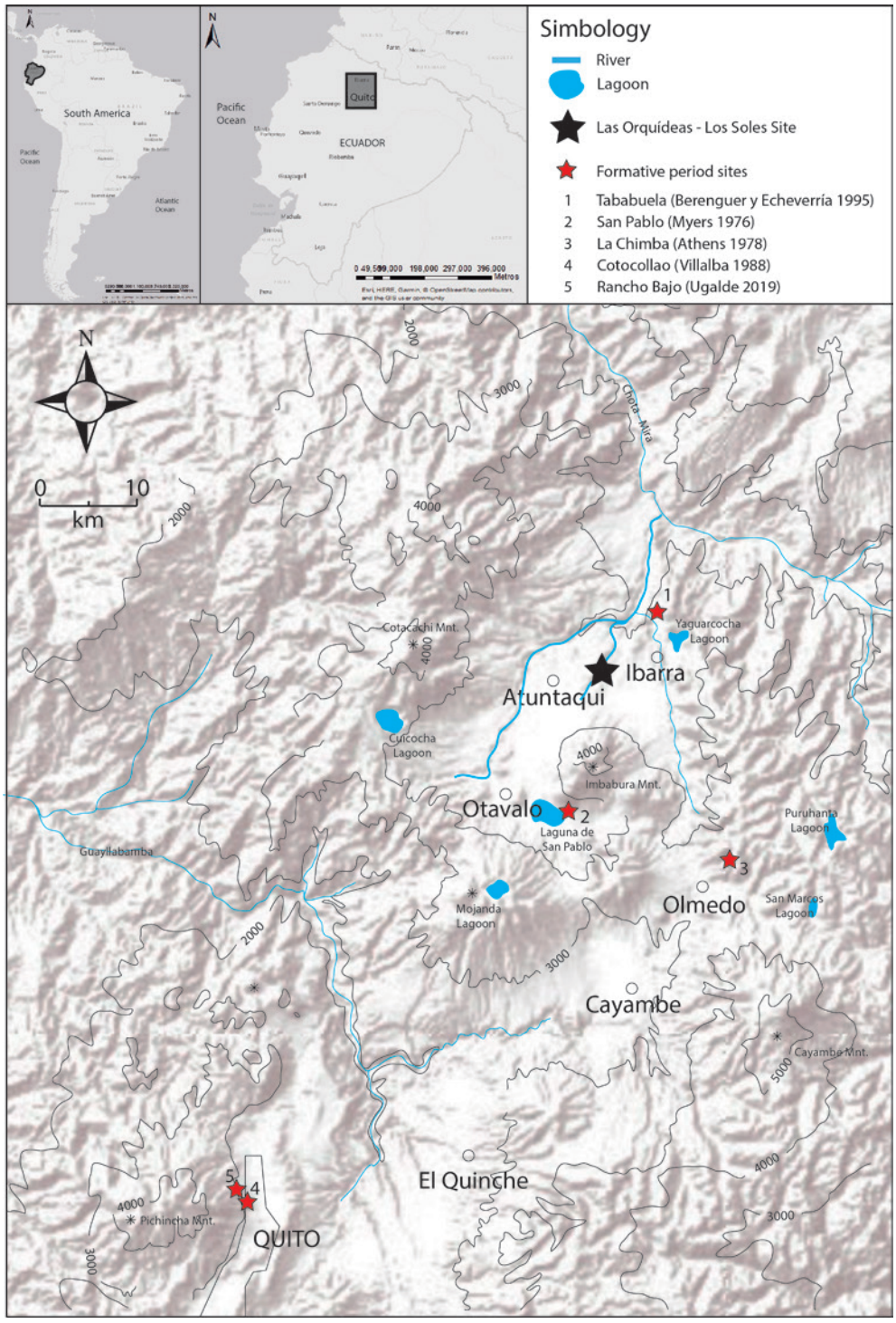


Fig. 1. Map of the northern Ecuadorian sierra with some sites mentioned in the text. (Map: Carlos Montalvo)

common knowledge that a significant number of the artifacts housed in the Museo del Banco Central in Imbabura´s capital (Ibarra) are looted materials from Los Soles. Valdez (Valdez 2008: 873) mentions a particular looted piece from the area: a ceramic *canastero*. This artifact, which depicts an individual carrying a basket on their back, likely came from northern Esmeraldas, the coastal region adjacent to the northern highlands.

5 The first documented archaeological site in the region dating to the first millennium BC also represents the only site where stratigraphic deposits previously have been radiocarbon dated. Athens (Athens 1978; Athens 1995: 6), after contact with a collector, began investigations at La Chimba, located near the modern town of Olmedo (Pichincha) in the 1970´s. Two excavation campaigns (one in the early 1970´s and another in the late 1980´s) produced important archaeological discoveries for the northern Ecuadorian highlands.

6 Excavations at La Chimba focused on documenting diachronic change. As a result, Athens proposed the first chronology for the pre-Integration Period (i.e. before AD 700) portion of the regional sequence. Fifteen radiocarbon dates from a single excavation unit (TP-7) form the basis for the reconstruction (Athens 1995: 10-11; Stahl - Athens 2001: 164). The dated samples indicate that the site was occupied from roughly 700 cal BC until cal AD 250 (Stahl - Athens 2001: 164).

7 Based on the distribution of ceramic styles, Athens (Athens 1978: 494-495) argued that the stratigraphic sequence could be divided into three relative phases. The earliest of these, Early La Chimba, covers a 260-year period from 700 to 440 BC (Stahl - Athens 2001: 165) that places it in what is broadly considered the Late Formative period

Fig. 2: Map of study area indicating area of excavations (black rectangle) and possible extension of Late Formative occupation (orange shading and black stars). (Graphic: C. Monatlvo)

in Ecuadorian archaeology. The characteristic ceramic style of the phase is a bowl that has a flat, protruding rim with punctuate designs on the exterior surface underneath the rim.

8 The two other proposed relative phases at La Chimba fall outside of the range usually identified as the Late Formative. Middle La Chimba, which runs from 440 – 44 BC, is demarcated by the presence of bowls with exterior diagonal and crosshatch incisions. Finally, the Late La Chimba phase spans roughly three centuries (44 BC – AD 250). Its diagnostic ceramic style consists of geometric designs in red paint on bowls and jars (Stahl - Athens 2001: 165).

9 These ceramic styles are distributed throughout a stratigraphic sequence with various deposits containing large quantities of artifacts. In the excavation of TP-7, a total of 19 layers of burnt organic material were identified that might represent occupational surfaces (Athens 1990: 32). Besides these concentrations of organic material, the most notable features documented were four burials, with one interment likely including utilitarian vessels as funerary goods.

10 Non-local goods are present at La Chimba from the beginning of the occupation. Athens (Athens 1995: 14) mentions that there are at least four species of marine

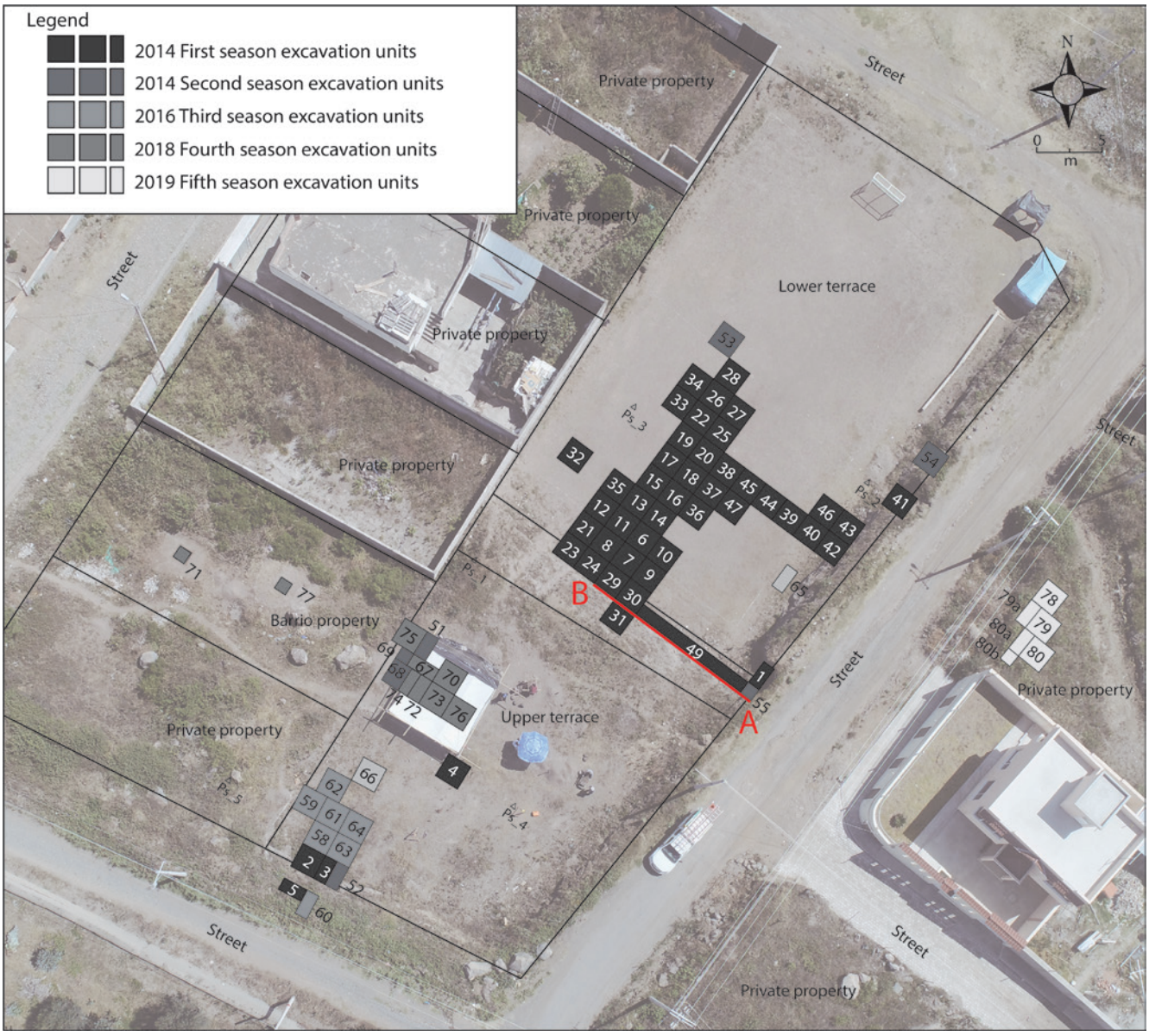


Fig. 3. Map of the excavation units at Las Orquídeas. The red line indicates the location of the profile shown in Figure 4. (Graphic: C. Montalvo)

shell in the artifact assemblage. The majority of the malacological remains appear to have been *Spondylus* sp. and *Strombus* sp., with a nacreous shell and conical gastropod identified in small quantities. Many of the recovered artifacts are small, angular pieces that led Athens (Athens 1995: 14-15) to argue that marine shell was worked on site. An analysis of diachronic change in the density of shell artifacts in TP-7 suggests that acquisition of these materials increased at some point between 400 – 300 cal BC (Athens 1995: 12, 17).

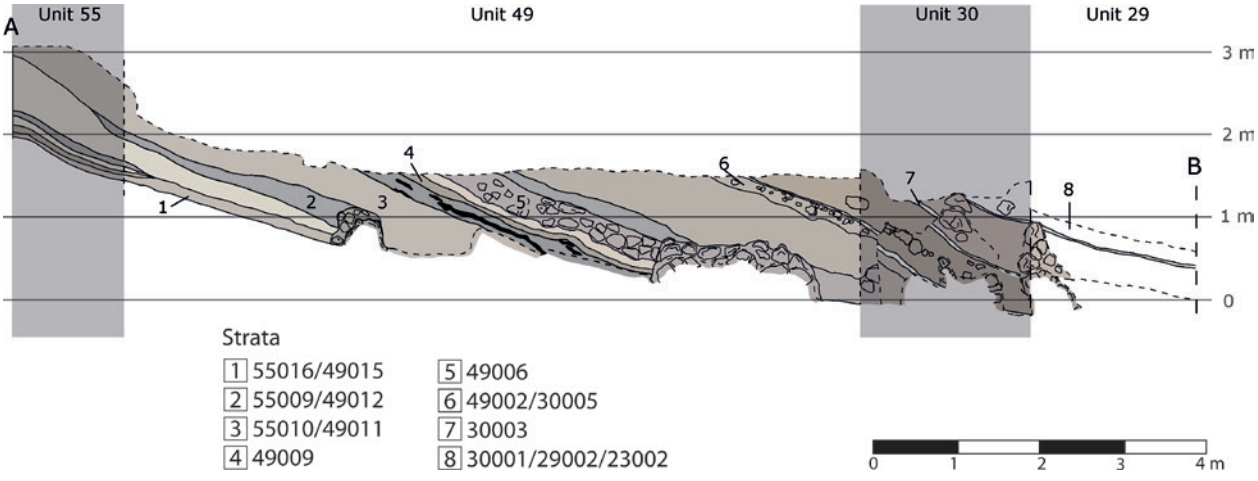
The most abundant non-local raw material is obsidian. In the two excavation units that were the primary focus of the later excavation campaign (TP-5 and TP-7), 18,943 obsidian artifacts were documented (Athens 1995: 20). Athens described the assemblage as primarily being the product of flaking, with some evidence of flake core fragments and flake tools.

11 A small collection of obsidian material (n=13) from the site has been geochemically sourced. At least one known obsidian source and two unidentified sources are included in the assemblage (Asaro et al. 1994: 271; Athens 1995: 21). The known source is Mullumica, the most utilized obsidian source in Ecuadorian prehistory. In Ecuadorian archaeology, one of the two unknown sources from La Chimba is referred to as "La Chimba type" obsidian because the first obsidian artifacts with this geochemical signature were documented at La Chimba (Asaro et al. 1994: 269).

12 The zooarchaeological assemblage from La Chimba also provides evidence of interregional interaction. While remains of white-tailed deer (*Odocoileus virginianus*) and rabbit (*Sylvilagus brasiliensis*) dominate the analyzed material, the presence of a squirrel monkey (*Saimiri scurieus*) and various species of exotic birds points to contact with low-elevation areas, likely in eastern Ecuador (Stahl - Athens 2001: 164; Tellkamp 2014). The recovery of Cosanga ceramics at La Chimba provides additional evidence for this connection with populations located farther east (Athens 1995: 18-20).

13 Prior to the recent research at Las Orquídeas presented here, no other archaeological site in the northern Ecuadorian highlands had produced such a variety of non-local goods as well as radiocarbon dates that fall within Athens´ Early La Chimba phase. In a review of previous research in the region, Athens (Athens 2003: 17) notes that early phase sherds were found at Im-11 and El Salado (Fig. 1), two sites located near Otavalo. In terms of additional evidence of early interregional interaction, excavations at Tababuela, a site located in the Chota Valley to the north of Ibarra (Fig. 1), recovered evidence of marine shell artifacts alongside Middle La Chimba phase sherds (Berenguer - Echeverría 1995: 232-234).

Fig. 4: A profile from the wall between the two modern terraces demonstrating the slope of various strata.



14 All of the outlined characteristics for La Chimba demonstrate that the northern Ecuadorian highlands is a particularly interesting case study for interregional interaction. As the second site with clear first millennium BC stratigraphy, Las Orquídeas builds on the knowledge from La Chimba and provides a point of comparison to analyze contemporaneous variability. The evidence presented here from Las Orquídeas also opens new avenues for research with detailed analyses of different artifact classes made from a range of raw materials.

Las Orquídeas

15 Excavations at Las Orquídeas began in late 2013 after the Gobierno Autónomo Descentralizado of Ibarra requested assistance with the analysis of archaeological evidence that was exposed during the creation of two terraces in the southern corner of the neighborhood Las Orquídeas. What began as a salvage project rapidly became an academic research project that has excavated 278 m2 over five field seasons (Fig. 3). While not planned, the evidence from the site also became the focus of the doctoral theses of both authors (Dyrdahl 2017; Montalvo 2016).

16 The excavation strategy at Las Orquídeas has been designed to take into account the particular characteristics of the site as well as the concerns of inhabitants of the neighborhood and different levels of local government. The Late Formative occupation of the site was situated on the slopes of an ancient hill that is not readily identifiable today because of heavy modifications to the landscape for the construction of houses. In the study area for Proyecto Arqueológico Las Orquídeas, which contains only the northern slopes of the hill, the gradient of the prehispanic slope often reaches up to 20-25° (Fig. 4).

17 The flat terraces produced by the public works project are cut into this slope, creating a situation where an excavation in the southernmost portion of each terrace begins at an early point in the stratigraphy. Excavation units placed farther and farther north on a terrace begin at progressively later sections of the stratigraphy. In the case of the northern terrace, the northernmost section had to be artificially elevated in order to create the flat surface. As a result, the entire vertical stratigraphic sequence for Las Orquídeas is exposed on the modern surface.

18 Members of the neighborhood were dismayed to learn that the only open space large enough to be a decent sized soccer pitch, the northern terrace, contained important archaeological evidence that would lead to a delay, or possibly even cancellation, of the proposed project. With this in mind, we elected to excavate the majority of the modern surface with exposed, intact archaeological evidence to a limited depth and reconstruct the diachronic sequence of the Las Orquídeas occupation via primarily horizontal excavations. This strategy permitted the recovery of the most at-risk evidence and made it possible for the neighborhood to use the space for soccer matches after the second field season. While there is still archaeological material to be recovered from deeper excavations on the northern terrace, the current utilization of this space as a soccer pitch serves to protect these artifacts from looting activity.

19 The southern terrace originally was destined to be a pair of volleyball courts. Considering the characteristics of the contexts in this sector that have been our primary investigative focus since 2015, the decision was made to relocate the courts to another location. Using knowledge of the site´s stratigraphy, in collaboration with the neighborhood an investigation was undertaken to locate a space suitable for these courts. Excavations were conducted to demonstrate that archaeological evidence was not at risk in the space that the community currently uses for volleyball courts.

20 The five excavation campaigns have utilized primarily 2 x 2 m units because of the difficulty associated with controlling the many exposed strata at the beginning of each excavation (Fig. 3). Within a single unit, each natural layer was treated as a single level of the excavation rather than employing arbitrary levels. This decision was made in large part because of the many thin strata in the site´s stratigraphy that easily could be confused and mixed if not guided by the original slope. A limited number of units have been excavated to more than 0.5 m below the modern surface or until sterile soil in order to confirm the stratigraphic sequence identified by the horizontal excavations.

Stratigraphy and Contexts

21 Four distinct spaces have been identified at Las Orquídeas (Fig. 3). These areas include a zone of secondary waste deposits (northern terrace), an intermediary space with primary trash pits and burials, a primary activity area with evidence of multi-crafting, and a small section of a domestic living surface and another crafting area. The latter three spaces represent new discoveries that have no equivalent for the first millennium BC in this section of the highlands.

22 The northernmost space has received the most attention to date because it became the neighborhood soccer pitch. This area, which more or less is equivalent with the northern terrace, would have represented the lower or middle slopes of the ancient hill. The recovered archaeological evidence suggests that this space primarily was utilized as a dumping ground for waste from other areas located farther upslope. A sequence of 28 strata has been documented, with 22 of these strata containing archaeological material (Fig. 5). Throughout this area, there are a few key strata that serve to tie together the sequence and resolve the issue that significant portions of the stratigraphy were destroyed to make the modern terraces. The earliest stratum of interest (Stratum 15) represents a burn event that was found in multiple excavation units (Fig. 3, Units 1, 40, 42, 43, 46, 49, 54, 55, and 65). Three radiocarbon dates suggest this event likely occurred between 800 – 750 cal BC (Fig. 5), with a fourth, incongruent, date potentially being the product of old material. Samples from three different strata located beneath this event support the argument that this burnt material was deposited in the proposed interval.

23 Another important stratum is a layer of irregular cangahua blocks (weathered, hardened volcanic soil (Ugalde 2017) that served as fill to modify the topography of the northernmost zone of the study area (Fig. 5, Stratum 12). The size and shape of the blocks varies greatly but generally the deposit has a depth of 50-60 cm. Notably, one of the eight burials found to date is located directly beneath this fill in Unit 41. While no organic material was found within the cangahua layer itself, a sample taken from the deposit directly above the cangahua in Unit 54 was dated to 782/642 – 567 cal BC, with a 38 percent probability that the deposit was placed within the same 50-year time span as the burn event.

24 The final key strata for the stratigraphic reconstruction are a series of four thin ash layers in the principal block of excavations on the lower terrace (Fig. 3 and Fig. 5, Units 6-38). No cultural material was found in these layers that likely are the result of cleaning pyrotechnic contexts. Each of these deposits is roughly 1-2 cm thick and serve as stratigraphic markers that separate deposits with large quantities of artifacts. These artifact-rich strata most likely date to 550 – 400 cal BC, but might potentially date to as early as 700 cal BC.

25 At the junction between the two modern terraces, to the southwest of this sequence of secondary contexts, a variety of primary contexts are found (Fig. 3, Units 51, 67-69, 70, 72-76). The most abundant of these are small trash pits that contain the densest concentrations of artifacts found on site (Fig. 6). The form of the pits is not

Stratigraphy*	Stratum Number	Radiocarbon Dates (two sigma) **
22001/26001/28001/53001 53002	1	
22002/26002/28002 22003/26003/28003	2	
22004/26004/28004/53003	-	
22005/26005/53004	3	2405 ± 20 BP = 658/542-403 cal BC
22006/53005	-	
53006	4	
22007/53007	5	2415 ± 20 BP = 723/545-404 cal BC
53008	-	
53009/53010/54001 53011/53012n	6, 7, 8	2430 ± 20 BP = 739/549-409 cal BC 2480 ± 20 BP = 767-537/519 cal BC 2470 ± 15 BP = 756/671-514/489 cal BC
54002	-	
54003	9	
54004	10	
54005	11	2530 ± 15 BP = 782/642-567 cal BC
54006	12	
54007/1005	13	
54008/1006	14	2510 ± 140 BP = 976/935-353/229 cal BC
54009/1007/55004	15	2565 ± 20 BP = 803-755/594 cal BC 2540 ± 20 BP = 793-748/567 cal BC 2550 ± 20 BP = 796-750/570 cal BC 2825 ± 20 BP = 1046/1020-914 cal BC
1008/55007	16	
1009/55008	17	
55010	18	
1010/55009 1011 1012	19	2545 ± 20 BP = 795-748/567 cal BC
1013/55012 1014/55013	20	2565 ± 20 BP = 803-755/594 cal BC
1015/55014	21	2550 ± 15 BP = 795-752/592 cal BC
1016/55015	22	
1017/55016	-	
1018	-	

Fig. 5: Stratigraphic sequence identified via excavations on the lower (northernmost) terrace at Las Orquídeas. * The first two numbers indicate the excavation unit and the last three the stratum in the unit´s sequence. ** All dates calibrated using IntCal20 (Reimer et al. 2020) and are presented following the suggestions in Rick et al. (2009) for dates affected by the Hallstatt Plateau.

consistent, as some are circular with a diameter of 40 cm, others are circular/oval with diameters around 80 cm, and the largest pit is an elongated oval that extends almost 3 m on its longer axis (northwest-southeast).

26 A total of six trash pits have been found in this area. A burnt seed from one of these features was dated to 717/543 – 404 cal BC (UGA-40215), while a burnt twig from another produced a date of 779/646 – 549 cal BC (UGA-40216). These results suggest that the pits date to a point in time between the burn event and the ash layers in the secondary fill contexts to the north.

27 These radiocarbon dates indicate that the population living on site was discarding waste downslope and also occasionally digging trash pits to the same end. It is

Fig. 6: Profile and excavation of one of the primary trash pits found in the northernmost section of the upper terrace (Photo: E. Dyrdahl)

not clear why both strategies were employed simultaneously. In this sense, the ongoing documentation of the artifacts found in the trash pits might uncover some differences that could offer ideas as to why this pattern exists.

28 The other archaeological feature with multiple examples in this sector is primary interments. These are less abundant than the trash pits, with only two examples. One of these two burials is notable because it contains the only evidence of grave goods: two ceramic vessels interred with a female who died between the ages of 18 and 25 (Fig. 7). A sample of bone from her skeleton was radiocarbon dated to 352/211 – 109 cal BC (UGA-40214), with the ranges of 352 – 287 cal BC (39.4%) and 211 – 109 cal BC (54.7%) being the most probable. Later stable isotope research reiterated the distinctiveness of this individual, as it was noted that her diet was radically different in comparison with the other documented individuals from Las Orquídeas, and likely a result of consuming greater quantities of maize (Torres Peña 2018: 159-160).

29 The final notable feature found in this intermediary area is a small offering of 10 complete ceramic vessels with residues in their interiors that was found in Unit 73 (Fig. 3. 8). The only other complete vessels recovered to date come from the previously mentioned burial and an isolated find in Unit 49. None of the 10 vessels are alike, with the majority being different forms of bowls. These vessels likely were placed as an offering related to a construction event represented by a small, localized cangahua fill found directly above the offering. Most of the vessels have small, hairline fractures that occurred after deposition and have not yet been reconstructed because of the interest in undertaking residue analyses.

30 Moving south once more, a third distinct area has been identified that likely represents a primary activity area for craft production (Fig. 3, Units 2-3, 52, 58-64, 66). Like the area of trash pits and burials to its north, this space has characteristics that have not been documented at any other site in the northern Ecuadorian highlands. Its central feature is a thick layer of volcanic ash that covers a horizontal surface of at least 20 m2. Generally, deposits of volcanic ash are used as chronological markers in Ecuadorian archaeology (e.g. Zeidler 2016), but in this case, as the excavation of the ash layer extended to the northeast, this deposit abruptly stopped (Fig. 3, Units 59 and 61).

31 Roughly 50 cm to the northeast of its termination, a large, roughly circular depression with a diameter of 1.6 – 1.7 m was discovered that has a steeper face (40 cm deep) on its southern border than its northern edge (20 cm deep) (Dyrdahl - Montalvo -

Fig. 7: The burial of a female individual who died between the ages of 18 and 25 and was interred in the intermediate area of trash pits and funerary contexts at Las Orquídeas. (Photo: E. Dyrdahl)

Fig. 8: Offering of 10 ceramic vessels found beneath layer of cangahua fill (755/595 – 460/420 cal BC (UGA-40217)). (Photo: E. Dyrdahl)

Valverde 2017: 94). The walls and sections of the cavity´s base were lined with volcanic ash and the only material found inside the feature was a layer of burnt twigs at the base. One of these twigs was radiocarbon dated to 771/711 – 541 cal BC (UGA-35761), which suggests that this cavity was utilized for pyrotechnic activities at the same type that the trash pits were in use 20 m to the north.

32 The initial hypothesis was that this cavity was for firing ceramic vessels and the feature was compared to likely firing contexts in Oaxaca (Balkansky - Feinman - Nicholas 1997) and on the northern coast of Peru (Russell - Leonard - Briceño Rosario 1994) in a publication shortly after its discovery (Dyrdahl - Montalvo - Valverde 2017). However, it is not clear why it would be necessary to line this cavity with volcanic ash in order to fire ceramic vessels. More analyses are required, but we now believe it is more likely that this context is related to the metallurgical tradition that developed at Las Orquídeas.

33 Excavations outside of the two terraces have been limited, but during the same field season, it was determined that the ash deposit does not extend far beyond the wall that currently defines the southern border of the upper, or southernmost, terrace. The discovery of well-defined boundaries is not the only evidence that this ash from the Cuicocha Volcano (22 km to the southwest of Las Orquídeas) was intentionally deposited. A radiocarbon date from beneath the deposit was dated to 771/650 – 545 cal BC (UCI-154693), while the current estimate is that Cuicocha erupted for the last time between 1800 – 1500 BC (Athens 1998: 178-179; Dyrdahl - Montalvo - Valverde 2017: 89). Ceramic artifacts were recovered beneath the ash layer that should not be present if the ash was deposited naturally.

34 This feature is not the only evidence of primary activities found in this area. Another pyrotechnic feature was identified roughly 4 m to the south of the previously mentioned context. The characteristics of the second feature are different, with a thick layer of burnt material (including twigs and seeds) found underneath a discrete layer of irregular cangahua and stone chunks (Dyrdahl - Montalvo - Valverde 2017: 94-95). One of the twigs from this concentration produced a radiocarbon date of 776/650 – 545 cal BC (UGA-35760), suggesting that the two pyrotechnic features were used contemporaneously.

35 Two notable concentrations of artifacts also were found in this area. Of the 301 *Olivella* sp. beads recovered at Las Orquídeas, 247 come from a single cache found at the southern edge of the investigated area (Fig. 9). While the motivation is unclear, it is important to mention that all of these finished beads are burnt. Another discovery related to personal adornments in this sector was a collection of feline fangs that likely represents a single necklace (Fig. 10). These artifact caches, combined with the pyrotechnic features, indicate that the ash surface likely was a primary activity area utilized for multicrafting, a theme that will be considered in greater detail in another publication.

36 Finally, the fourth space of interest is the result of a small excavation in 2019 on the opposite side of the road that defines the eastern boundary of the modern terraces (Fig. 3). As part of the construction activities in the zone, new light posts were installed. A small amount of loose soil was removed in this process, exposing another ash surface comparable to the one discussed earlier. After receiving permission from the landowner, we undertook an excavation to salvage what was left in this heavily eroded zone.

37 Besides the ash surface, only small sections of two archaeological features could be recovered. The first was one wall of a cavity that likely was similar to the one described previously. The other, a small strip of a hardened floor located in association with the stratum above the ash floor/cavity, represents the only evidence of a possible house floor that has been identified so far at Las Orquídeas.

Fig. 9: A sample of the burnt Olivella sp. adornments found in the southwest corner of the upper terrace. (Photo: E. Dyrdahl)

38 Ultimately, despite the modern landscape modification that has taken place, it has been possible to document a variety of distinct spaces and begin to piece together a general idea of a site layout. The current hypothesis is that excavations have not yet found evidence of domestic structures because they were located farther upslope. If accurate, the work surfaces of ash would be located between the houses and the section with the primary refuse pits and burials. Farther downslope from the pits and burials, on the lower slopes of the hill, are the fills that consist primarily of secondary refuse thrown downslope. Considering the increased artifact density in the uppermost refuse deposits, it appears probable that the inhabited area of the site grew over time, which would explain the compacted floor found above the second ash surface.

39 It is possible that domestic structures might never be found at Las Orquídeas because of modern activity. Most of the upslope area is covered by recently constructed houses, but prior to this, there is evidence of other landscape modification events that would have caused a great deal of destruction. The possibility of finding domestic structures is limited mainly to a eucalyptus forest located on the other side of the road

Fig. 10: Collection of feline fangs found in association with the ash surface in the southwestern corner of the upper terrace. (Photo: E. Dyrdahl)

that marks the southern boundary of the study area (Fig. 2). However, the topographical characteristics of this space suggest that perhaps only the northernmost domestic structures in the habited area of the site are still intact.

Ceramics

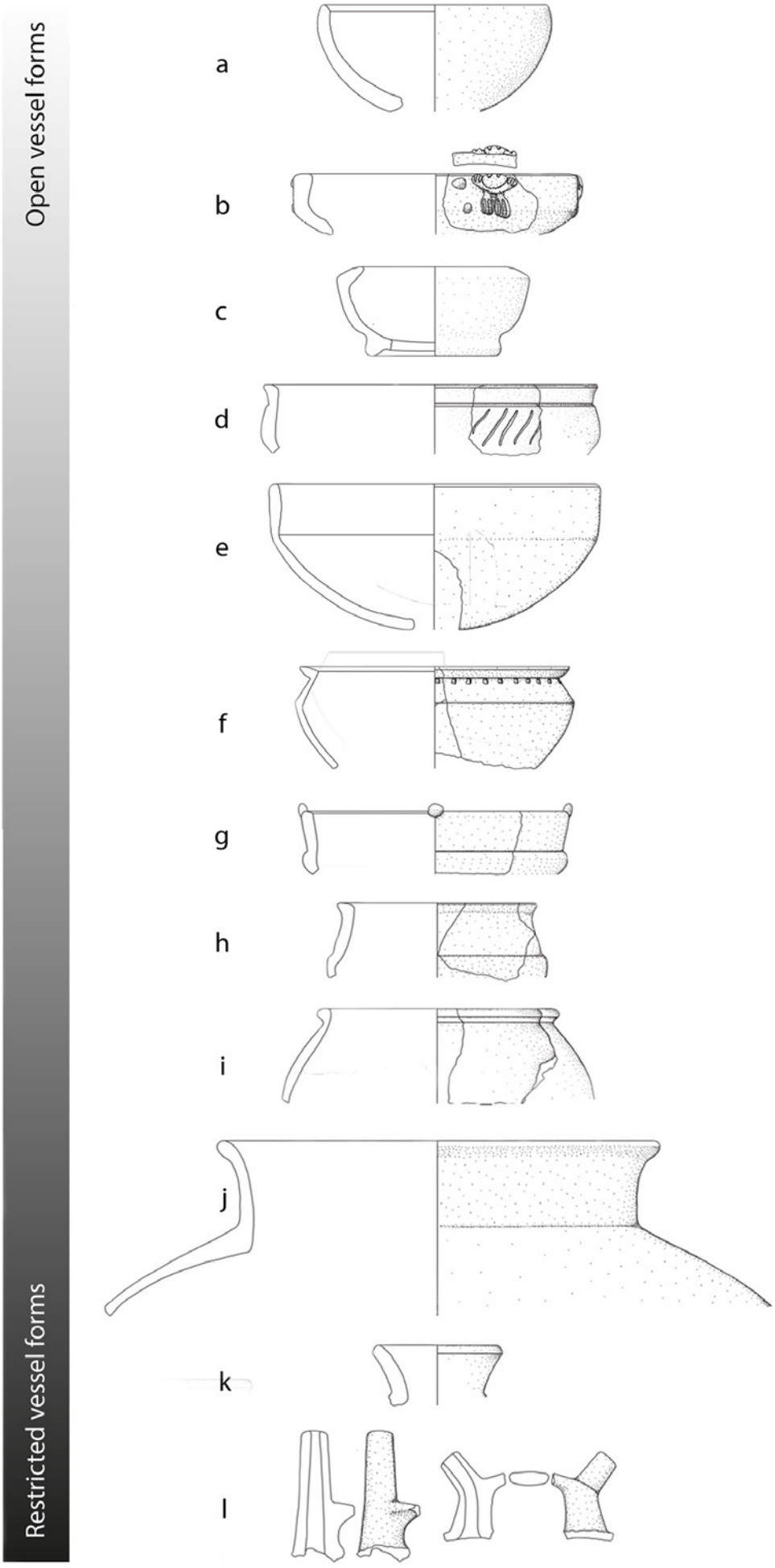
40 One of the authors of this paper (Montalvo) selected a representative sample of ceramic artifacts from the sequence of secondary fill deposits on the lower slopes with the goal of developing a seriation with finer-grained data for a 400-year period (800 – 400 cal BC) that is roughly equivalent to the Early La Chimba phase proposed by Athens (Athens 1978: 494). The sample consisted of 2,518 sherds identified as suitable for form reconstruction from a population of 19,007 diagnostic sherds. In this paper, only a general discussion of the results of this analysis is outlined because of space constraints and the established objective of this article being the discussion of a wide variety of evidence. A more detailed overview of the ceramic assemblage from Las Orquídeas will be presented in another article.

41 The collection was examined from various perspectives, beginning with a division between open and closed forms (Fig. 11). A total of 211 types and 53 unique fragments can be divided into 12 formal classes. Some general trends were noted in the distribution of these classes throughout the stratigraphic sequence. Eight of the classes are present from the beginning of the sequence, but there are four classes that only appear in the second half of the sequence: bowls with rounded bodies (Fig. 11d), bowls with marked necks and unmarked rims (Fig. 11g), bowls with marked necks and rims (Fig. 11h), and ollas/jars with marked necks (Fig. 11j). These classes all appear at a key moment in the site´s occupation at which many changes occur, some of which will be discussed later in this article.

42 The distribution of the 211 types throughout the 22 strata with archaeological materials also was analyzed in order to examine whether relative phases could be created based on a ceramic seriation by type. This analysis by Montalvo resulted in the identification of four phases. Phase one covers Strata 17 – 22 and likely dates from 800 – 750 cal BC. A few examples of diagnostic types for this phase are found in Figure 12 (Fig. 12: types a-f). Phase two starts in Stratum 16. It includes both the burn event and layer of cangahua fill mentioned earlier, and ends in Stratum 9, before the thin layers of ash. Based on the radiocarbon dates, the absolute dates proposed for this range are 750 – 650 cal BC. Five examples of diagnostic types for this phase can be found in Figure 12 (Fig. 12: types h-l). Phase three begins with the earliest thin ash layer and ends with the most recent of these layers. It includes Strata 3 – 8 and the estimate for its absolute date range is 650 – 500 cal BC. Examples of diagnostic types for this phase can be found in Figure 13 (Fig. 13: types a-b). Finally, phase four consists of two thick layers of secondary fill (Strata 1-2) that combined represent roughly 1 m of stratigraphy. No radiocarbon samples that can be directly associated with these strata have been dated because of a preference for analyzing samples from primary features. One of the primary trash pits found in these layers has been dated to 727/541 – 404 cal BC (UGA-40215), with 541 – 404 cal BC as the most probable range (92.8%). Since a carbon sample from the uppermost stratum of phase three returned a similar result (Fig. 5, Stratum 3), it is possible to propose that phase four might run from 500 – 400 cal BC. Examples of diagnostic types for this phase are presented in Figure 13 (Fig. 13: types d-m).

43 On a regional scale, the ceramic assemblage at Las Orquídeas is part of the same tradition discovered at La Chimba (Athens 1978; Stahl - Athens 2001). The collection from Las Orquídeas suggests that some modifications might be required to the chronology presented by Athens (Athens 1978), as ceramic vessels decorated with incisions, which have been considered indicative of Middle La Chimba, are found as early

Fig. 11: Organization of the ceramic classification by morphological group. (Drawings: C. Tavolini, D. Deidda, and C. Montalvo)



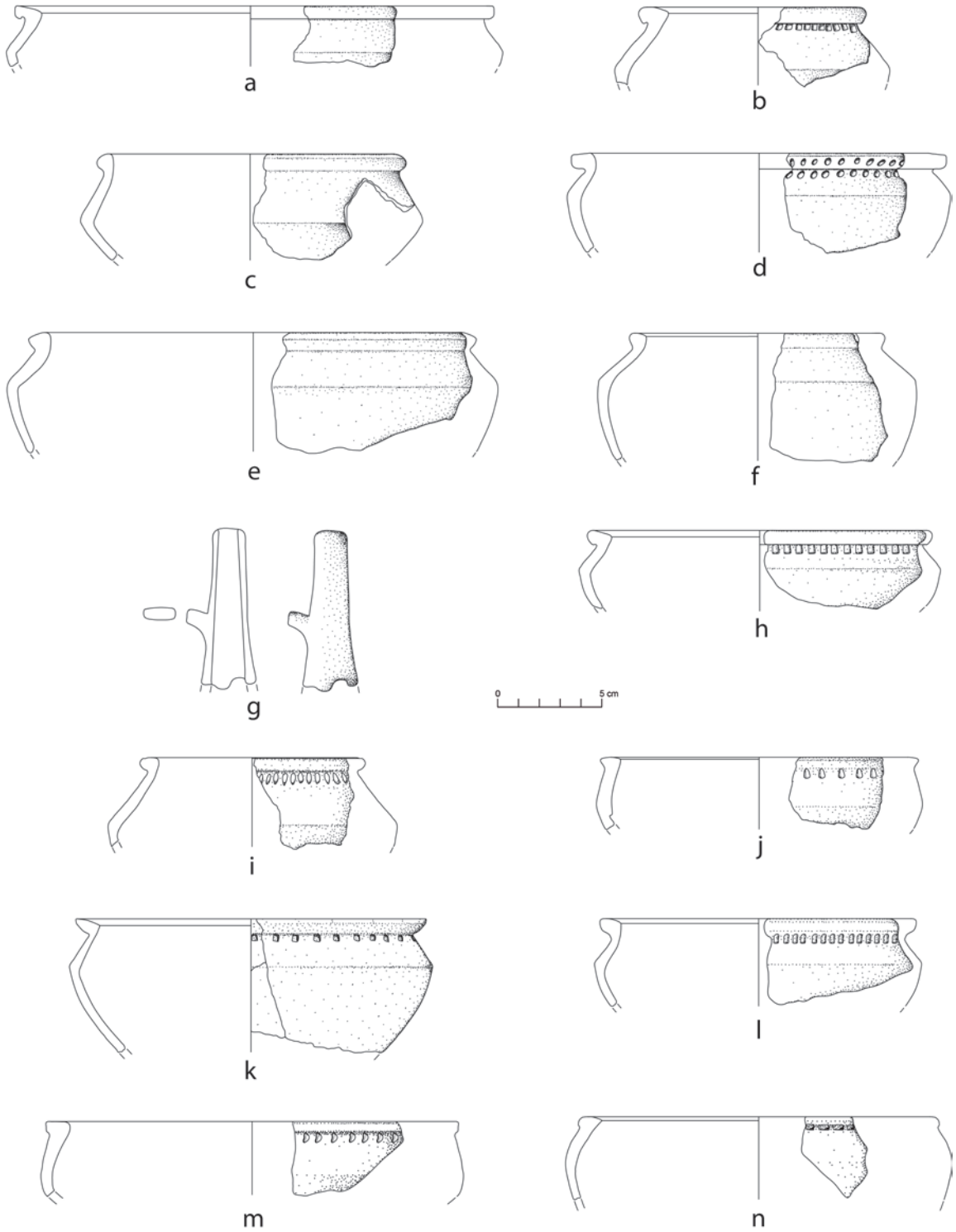


Fig. 12: Diagnostic ceramic forms at Las Orquídeas (Scale 1:3). Phase I diagnostic ceramic forms: a-f; Phase I-II diagnostic ceramic forms: g; Phase II diagnostic ceramic forms: h-l; Phase II-III diagnostic ceramic forms: m-n. (Drawings: C. Tavolini, D. Deidda, and C. Montalvo)

as the second phase (750 – 650 cal BC) at Las Orquídeas. It also is possible that there is some degree of variation between Late Formative sites in the appearance and history of decorative types. More research and evidence from additional sites is needed to analyze the context, timing, and significance of different shifts throughout the region.

44 Some components of the Las Orquídeas ceramic assemblage also can be compared to published material from the site of Tababuela (Berenguer - Echeverría 1995). The Tababuela ceramic assemblage consists of types that are found in the phase four assemblage at Las Orquídeas. This finding supports Athens´ (Athens 1990: 38) estimation that this site likely dates to Middle La Chimba.

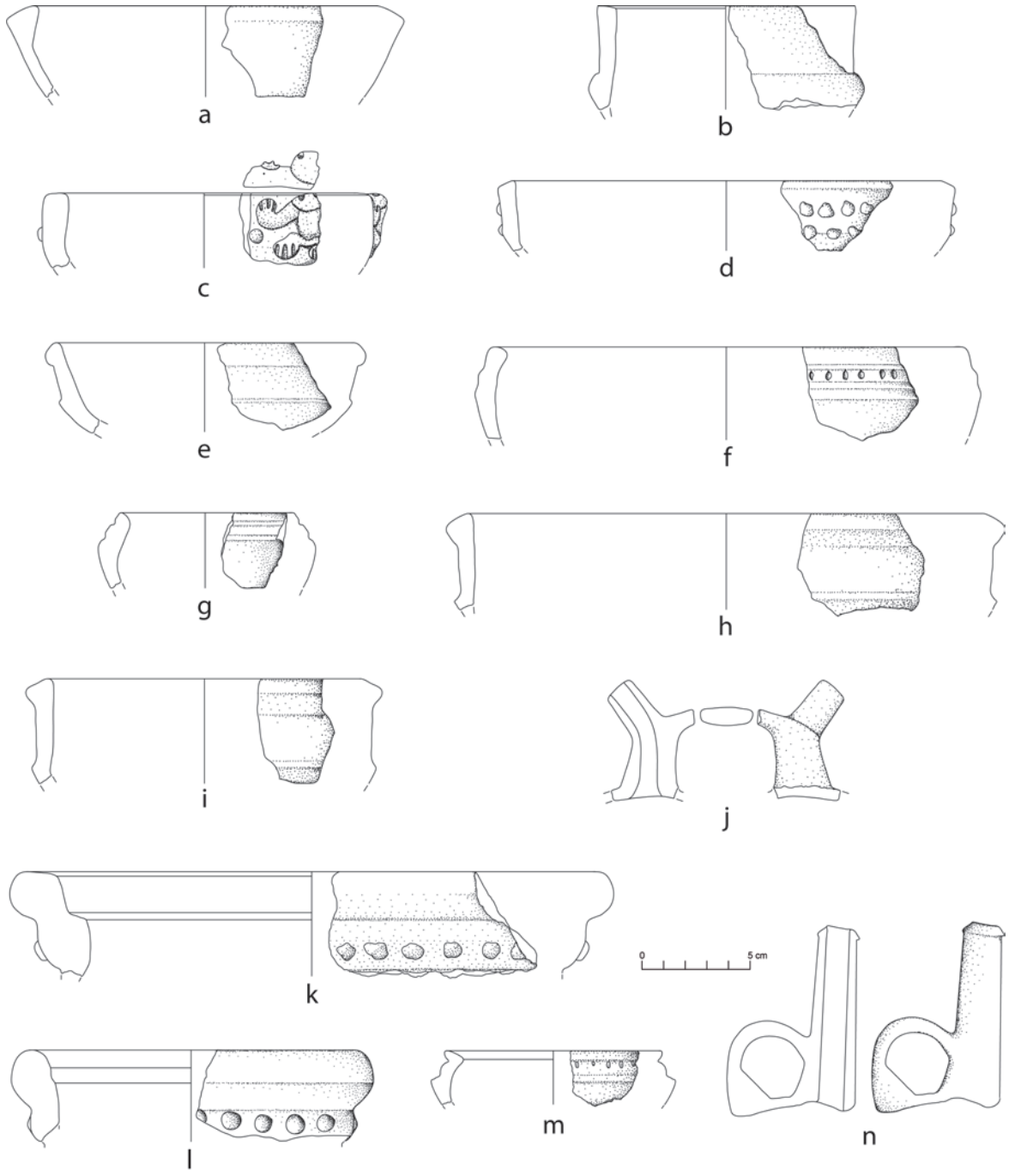


Fig. 13: Diagnostic ceramic forms at Las Orquídeas. Phase III diagnostic ceramic forms: a-b; Phase III-IV diagnostic ceramic forms: c; Phase IV diagnostic ceramic forms: d-m. Phases I-IV diagnostic ceramic forms: n. (Drawings: C. Tavolini, D. Deidda, and C. Montalvo)

45 Farther south, the Cotocollao ceramic tradition is predominant in the Quito region during the period of interest (Villalba 1988). Cotocollao style whistling bottles have been found at Las Orquídeas, suggesting contact between the two regions. The possible influences of Machalilla and Chorrera in the Cotocollao tradition also are important (Villalba 1988: 119-125, 181-185) and similar influences can be seen in the Las Orquídeas assemblage.

46 With regard to these coastal influences, the morphological similarity between the earliest carinated bowls at Las Orquídeas and Machalilla carinated bowls is notable. These bowls, with their profoundly rounded lower body, a short, closed, upper body, a marked and thickened rim and rounded or triangular lip, are a regular component of Machalilla assemblages (Fig. 14a,b) (Meggers - Evans - Estrada 1965: 117-140; Bischof 1975: 47; Lippi 1983: 243-250; Prümers - Ugalde 2018: 34-36). The differences between

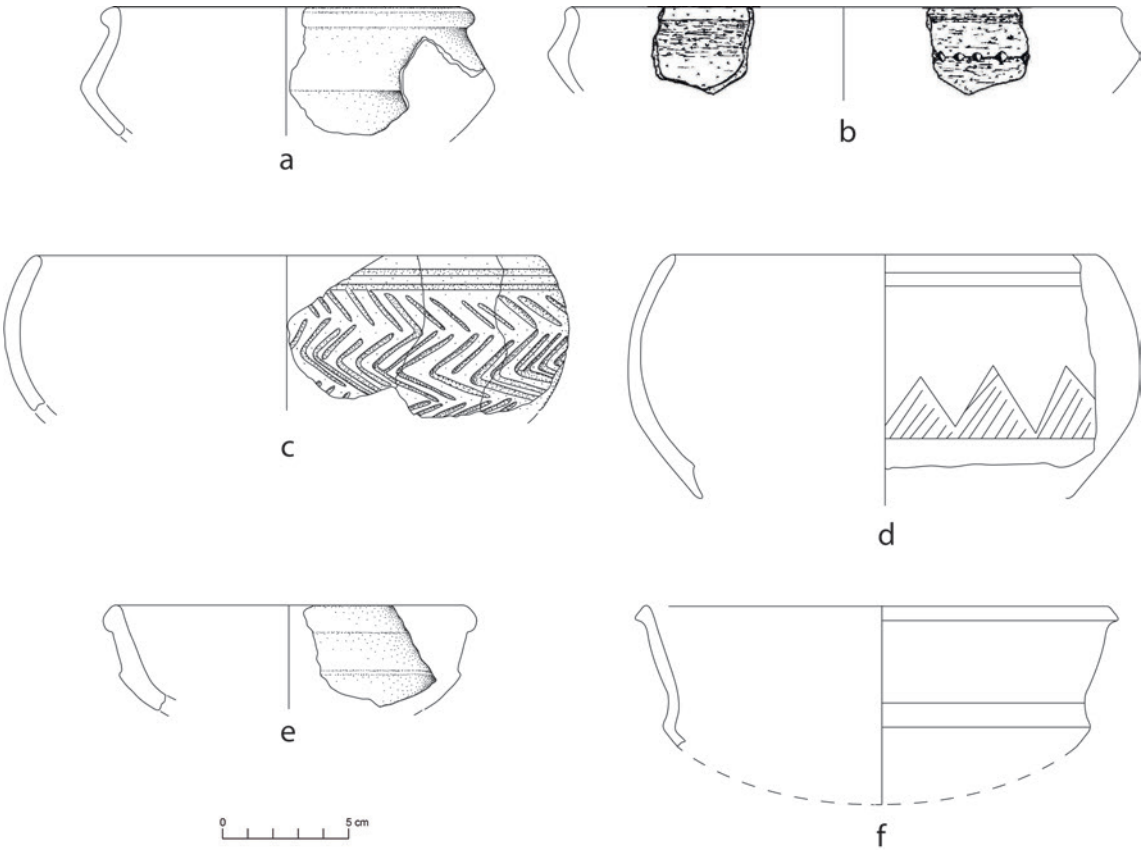


Fig. 14: Non-local ceramic fragments found at Las Orquídeas. (Drawings: C. Tavolini, D. Deidda, and C. Montalvo)

the two carinated bowl traditions lie in temporality and decoration. The Machalilla bowls generally are decorated with notches on the carination or incised motives on the upper body, while at Las Orquídeas and La Chimba the punctuate decoration beneath the rim is typical (Athens 1978: 494; Montalvo 2016). With regard to temporality, most Machalilla sites date to slightly earlier than the beginning of the Las Orquídeas occupation (Zeidler 2008: 460) proposes that Machalilla existed from 1430 – 830 cal BC), which makes it possible to imagine that these forms and the introduction of ceramics in the northern Ecuadorian sierra around 800 cal BC might relate to migrations from the coast.

47 The whistling bottles found at Las Orquídeas up until the third relative phase are from the Chorrera tradition (Villalba 1988: 176-180). It also appears possible that some of the open forms from the Chorrera tradition, which originated in Machalilla, might have influenced the forms of various ceramic classes (Fig. 11a,b,e) at Las Orquídeas. Beyond influences in locally produced ceramics, there also are hundreds of fragments that appear to have been imported based on the clay, surface treatments, and other characteristics (e.g. bottles with zoomorphic or anthropomorphic elements) (Cummins 1992: 65-74; Cummins 2003).

48 Remnants of Bahía ceramics have been found at Las Orquídeas in the form of both fragments of ceramic vessels and anthropomorphic figurines (Fig. 14c,d). The excavations undertaken have recovered deep, finely burnished bowls with red and white slips and excised decorations in the phase four stratigraphy at Las Orquídeas. These artifacts are comparable to the Pajonal ceramic complex identified in Sector A at the site of Chirije (Mejía 2005). More information regarding the evidence for anthropomorphic figurines from coastal societies at Las Orquídeas will be presented in another publication.

Fig. 15: Ceramic fragment from a La Tolita figurine. (Photo: E. Dyrdahl)

49 Contact with the northern Ecuadorian coast is evidenced by the appearance of the double spout bottle in the phase three assemblage (Patiño Castaño 2000: 124), as well as open carinated bowls and bowls with marked shoulders, forms that are associated with late Chorrera occupations in the area of La Tolita (Fig. 14e,f) (Bouchard - Usselmann 2003: 59-62). Another artifact that can be connected to this region is a fragment of a representation of a hybrid being associated with La Tolita (Fig. 15) (Ugalde, personal communication, 2021). The importance of contacts with various coastal groups is clear based on the ceramic assemblage, and later in this article we will present malacological evidence from Las Orquídeas that reinforces the significance of coastal-highland connections during the first millennium BC.

Obsidian

50 Obsidian is the most abundant non-local raw material at Las Orquídeas. The obsidian assemblage from La Chimba has not been studied in detail, making the Las Orquídeas collection an important window into obsidian economics for the first millennium BC in this region. More than 150,000 artifacts have been recovered and constitute one of the largest obsidian collections in Ecuador. As part of his doctoral dissertation, Dyrdahl (Dyrdahl 2017: 255-311) analyzed 46,440 of these artifacts from a technological perspective. This technological study represented the first application in Ecuador of a classficatory framework for obsidian technology developed in Mesoamerica (e.g. De León 2008). Prior to this investigation, the majority of Ecuadorian obsidian studies emphasized the analysis of formal tools. Additionally, 1,142 artifacts were selected as a sample to assess obsdian acquisition practices via geochemical characterization using X-Ray Fluorscence (XRF). The characteristics of the instrumentation utilized and the methodology employed can be found in another publication (Ugalde - Dyrdahl 2021).

51 In terms of technology, the obsidian reduction strategy at Las Orquídeas is best characterized as an expedient flake technology that required little preparation of the acquired raw material. The most abundant technological categories are undiagnostic percussion flakes (i.e. flakes without ridges on their dorsal surface that begin at the platform and run to the distal section) and fragments of these flakes without a platform. Exhuasted cores support this general interpretation, with their irregular flake removal scars demonstrating a strategy best described as electing how to remove the next flake only after the last one has been removed. While this strategy could be construed as little expertise in obsidian flaking, the discovery of the occasional more elaborate piece (such as triangular blades removed via direct percussion) is suggestive of a situation where the primary uses of obsidian on site did not require a more elaborate reduction strategy.

52 While this general technology predominates in the occupational sequence and there is no clear evidence for notable changes between the proposed relative phases, there are a few diachronic trends that do merit mention. Over time, there is a reduction in artifact size, with more than 60 percent of the phase four assemblage having its greatest dimension measure less than 2 cm, while artifacts with these dimensions represent only 34.1 percent of the analyzed phase one materials. Alongside this reduction in artifact size, there also is an increase in the amount of shattered material

in each relative phase. The most drastic shifts in these trends occur between phase two and phase three of the proposed relative sequence.

53 This reduction in artifact size and increase in shattered material potentially are caused by a shift in obsidian raw material acquisition discovered in the chemical composition study. The results of this study, which beyond analyzing exhausted cores selected its sample based on artifact size and cortex in order to reduce the probablility of analyzing multiple artifacts removed from the same nodule, indicate that while Low Fe Mullumica is the predominant raw material source, it begins to decline in importance in phase three of the relative sequence. In its place, more material is acquired with chemical signatures pertaining to Low Fe Callejones (first identified by Bellot-Gurlet et al. (Bellot-Gurlet - Dorighel - Popeau 2008: 279)) and the previously mentioned "La Chimba type" (Asaro et al. 1994: 269). One possible interpretation is that the utilization of these two raw material sources resulted in the acquisition of smaller nodules and lower quality material in the second half of the Late Formative occupation.

54 There is no evidence that obsidian artifacts made at Las Orquídeas changed hands in exchange. The distribution of artifacts with evidence of use wear by technological category closely mimics the overall category percentages, suggesting that no particular artifact type was preferred for utilization and that there is no technological category underrepresented that might be indicative of exchange.

55 As will be presented shortly with regard to *Spondylus* (particularly *Spondylus princeps*) and mother-of-pearl (primarily *Pinctada mazatlanica*), it appears that obsidian likely moved through the exchange network mainly as a raw material rather than a finished good. XRF analysis of the entire assemblage of obsidian artifacts (n=56) from the site of La Brea on the northern coast of Esmeraldas (Valdez 2006: 196) indicates that almost all of the raw material came from the Mullumica source and has a low Fe signature. This material comes from a context dated to 918 – 780 cal BC (Valdez 2006: 198), a range that best aligns with phase one of the relative sequence at Las Orquídeas. During this phase, more than 90 percent of the obsidian at Las Orquídeas comes from this source, with the only other geochemical signature present at La Brea, Low Fe Callejones, being the second most common signature in this phase (Ugalde - Dyrdahl 2021). These data, in combination with the technological analysis of the La Brea obsidian demonstrating that obsidian probably was worked on site (Dyrdahl 2017: 299), point to a likely scenario being that La Brea and Las Orquídeas were part of the same exchange network in which only slightly worked (to remove the cortex) obsidian raw material was moved.

Malacolgical remains

56 The discovery of malacological remains at a Late Formative site in the Ecuadorian highlands is not surprising. In the southern highlands, a variety of *Spondylus* artifacts have been found at Cerro Narrío (Blower 1995: 89; Carter 2011: 69; Collier - Murra 1982: 94-95; Bruhns 2003: 153) and a smaller amount of evidence at Catamayo (Guffroy 1987; Guffroy 2004; Guffroy 2008: 893-894), Putushio (Carter 2008: 126; Temme 1999), Chinhuilanchi (Uhle 1922; Guffroy 2008: 893) and Pirincay (Bruhns 2003: 161; Hammond - Bruhns 1987: 52). Meanwhile, as previously mentioned, in the northern highlands the artifact assemblage from La Chimba contains four different species, including *Spondylus* sp. and what likely is *Strombus* sp. (Athens 1995: 14-18).

57 Athens argues that the small, angular fragments of marine shell found at La Chimba suggest that these materials were worked in the northern highlands during the Late Formative. Las Orquídeas provides unequivocal evidence that this was the case. Additionally, the diverse assemblage of jewelry made from malacological materials offers data related to the exchange networks of the period that leads to a more

refined understanding of the nature of the interregional contacts that were important to populations in the northern highlands.

58 In this paper, our primary foci are the *Spondylus* and mother-of-pearl assemblages, but these are not the only malacologcial materials utilized by the population at Las Orquídeas. While more limited in number, all of the following species have been identified: *Trivia solandri*, *Jenneria postulata*, *Columbella* sp., *Conus* sp., members of the Olividae family (*Oliva* sp. or *Agaronia* sp.), and the previously mentioned *Olivella* sp. These gastropods are almost completely absent (save one example of *Olivella* sp.) in the phase one assemblage, begin to become more common during phase two and three (all present minus *Columbella* sp.), and every mentioned species of gastropod is part of the phase four collection.

59 These gastropods were transformed into beads or pendants via slight modifications that involved at least one of the following activities: removal of the apex, the creation of a perforation on the dorsal surface (opposite the aperture), and polishing. The nature of these processes leaves less evidence of where they were crafted in comparison with other non-local goods. The presence of two apexes of *Conus* sp. and a pair of complete *Olivella* sp. specimens indicates that at least these gastropods probably were worked on site.

60 The *Spondylus* and mother-of-pearl finished artifact assemblages roughly mimic the chronological pattern noted for the gastropods. Beyond a trio of *Spondylus princeps* artifacts that likely were pendants, all of the *Spondylus* jewelry on site is found in the form of two types of beads: discoidal and cylindrical (Fig. 16a). Within a broader bead assemblage (n=1802) that includes many other types of raw materials, roughly half of the beads (n=964) might be *Spondylus*.

61 The preservation of beads at Las Orquídeas is excellent (Fig. 18). Once cleaned in an electrosonic bath, the color of most beads is comparable to when they were in use. The use of the word “might” in the previous paragraph relates to problematic white beads that might have been made from a section of the interior of a *Spondylus* valve. The 506 white shell beads also could have been fabricated using a number of other marine shells, and therefore they cannot be confidently attributed to *Spondylus*.

62 There are 458 complete or fragmented beads that have the texture and color (red, purple, or orange) indicative of *Spondylus*. 16 of these beads cannot be included in a diachronic analysis because they cannot be attributed to a particular phase with confidence. After only a pair of examples in phase one, there is a slight jump to 15 beads in phase two. The dramatic shift in the presence of *Spondylus* beads occurs in phase three (n=207) and thereafter plateaus in phase four (n=216).

63 Beyond the clear increase in the latter-half of the stratigraphy, there are a couple of additional discoveries that merit mention. The first has to do with the division of beads by color and form (Fig. 17). A limited number (n=4) of bead fragments cannot be confidently attributed to a particular form and therefore are excluded from the data in Fig. 17. Within the purple bead assemblage, cylindrical beads represent two-thirds of the 80 beads recovered, while the red and orange bead collections are dominated by discoid beads. These patterns suggest that a particular bead form was preferred for each color.

64 The second discovery also relates to color and as a result, possibly species. A total of 374 *Spondylus* artifacts attest to the crafting of this raw material on site. Only one of these artifacts is from the first two relative phases, with most of the recovered material pertaining to phases three and four. The *chaîne opératoire* utilized to work *Spondylus* will be the focus of another paper. What is important for this article is that none of these remains related to production waste is purple in color, suggesting that only red and orange raw material was worked on site. The color of the different *Spondylus* species

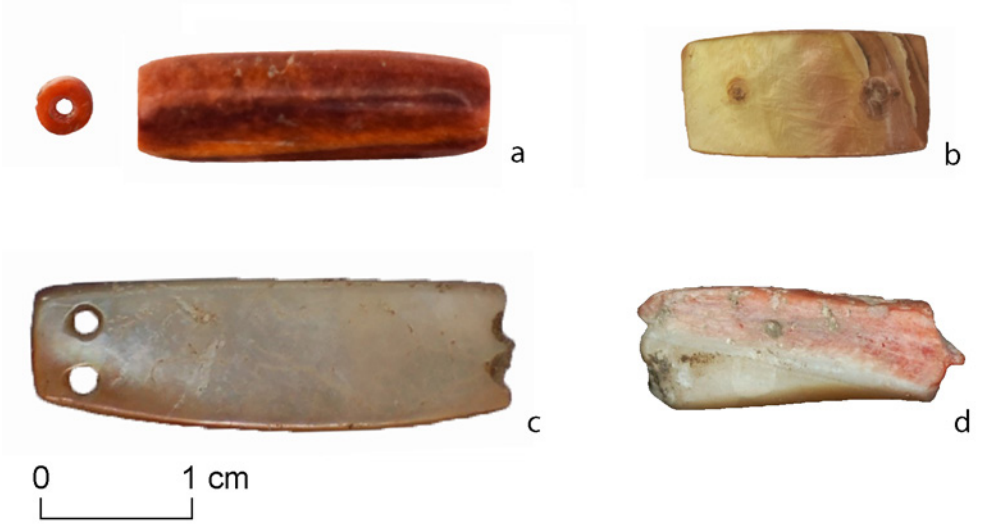


Fig. 16: a. Examples of discoid (left) and cylindrical (right) Spondylus beads found at Las Orquídeas. b. An unfinished mother-of-pearl rectangular plaque preform found at Las Orquídeas. The left perforation is unfinished. c. An example of an irregular mother-of-pearl plaque from Las Orquídeas. d. Cross-section of a rectangular disk made from Spondylus princeps that was documented at Las Orquídeas. (Photos: E. Dyrdahl)

can vary, but this assemblage could indicate that only *Spondylus princeps* raw material was crafted at Las Orquídeas.

65 There are a few types of *Spondylus* adornments that might have been made at Las Orquídeas, including thick discoid beads (two preforms, one broken during perforation) and rectangular plaques with one red/orange surface and an opposing white surface (Fig. 16d), similar to the *Spondylus* artifacts Guffroy (Guffroy 2004: 75) found in the Catamayo region, but without the central perforation. Another notable find are various red cylindrical bead preforms that splintered during the perforation process (Ugalde - Dyrdahl 2021). In relation to the previously presented *Spondylus* bead data, it is worth highlighting that Las Orquídeas artisans were making red cylindrical beads while red discoid beads dominate the finished artifact assemblage.

66 Turning to mother-of-pearl (*Pinctada mazatlanica* and *Pteria sterna*), both finished adornments (n=505) and raw material waste (n=627) from crafting activities have been found at Las Orquídeas (Fig. 16b,c. 18). The *chaîne opératoire* employed to work mother-of-pearl is the focus of a separate paper. The predominant adornment type in the collection is plaques (disks with two or more perforations) comparable to those found by Mester (Mester 1985: 109; Mester 1990: 177-183) in a Manteño occupation (AD 800 – 1100) at Los Frailes, Manabí. A division of the plaque assemblage (n=475) primarily by form (rectangular, circular, oval) as well as number (two or three) and location of perforations identified 11 different categories or types at Las Orquídeas (Dyrdahl 2017: 351) with one particular type dominating each shape.

67 Mother-of-pearl plaques are present from the beginning of the occupation (n=7 in phase one), but as noted for other adornment types, the biggest shifts generally occur in phase two or three. In the case of mother-of-pearl, the first major increase occurs in phase two (n=84), and after plateauing in phase three, another increase occurs in phase four (n=195). The quantity of plaque types present also rises over time, with only two types found in phase one and all 11 present in phase four.

68 Briefly returning to the evidence for mother-of-pearl crafting, while the physical characteristics of mother-of-pearl result in more factured material that complicates the *chaîne opératoire* analysis, there are possible preforms for rectangular (n=7) and circular/oval (n=11) plaques in the assemblage. The most definitive evidence for plaque crafting is a rectangular preform with one perforation completed and another started but unfinished (Fig. 16b). Waste artifacts from mother-of-pearl crafting with clear evidence of worked edges first appear in phase two and are more abundant in phases three and four.

Fig. 17: Spondylus beads by color and form.

Color	Discoidal	Cylindrical	Total
Red	222	14	236
Orange	129	9	138
Purple	27	53	80
Total	378	76	454

Discussion

69 On its own, the evidence presented for interregional interaction and craft production in this article arguably would put Las Orquídeas on par with any other archaeological site in Ecuador. However, what has been presented here is only a sample. There is evidence for the development of a metalurgical tradition on site (processing ore to finished products) (Fig. 19a), spoons made from *Megalobulimis* sp. (Fig. 19b), as well as artifacts that attest to crafting all of the following objects: bone tools (Fig. 20 a-c), bone adornments, slate tools (Fig. 20d), stone bowls (Fig. 20e), groundstone tools (manos, metates, hammerstones, polishers, etc.), beads and pendants made from many other raw materials, and ceramic vessels. We also have documented an ivory pendant made from a *Phyester catodon* tooth (Ugalde - Dyrdahl 2021) as well as non-local ceramic vessels and figurines that hint at connections with multiple coastal societies (e.g. Chorrera, La Tolita, Jama-Coaque, and Bahía).

70 The investigation at Las Orquídeas will improve our understanding of first millenium BC lifeways in many senses, but arguably the most signficant with regard to the evidence presented here is the nature of the interactions undertaken as part of the interregional networks that the population at Las Orquídeas participated in. While it generally has been assumed that long-distance exchange in prehispanic Ecuador involved only finished objects in a pattern similar to that seen in the southern Ecuadorian highlands during the same time period (Bruhns 2010), the artifact assemblage from Las Orquídeas provides unequivocal evidence that at least some portion of exchanges involved unworked raw materials. As previously mentioned, the evidence from the only other Late Formative site in the region, La Chimba, is more fragmentary (i.e. primarily small, angular pieces of malacological waste) yet supports this conclusion (Athens 1995).

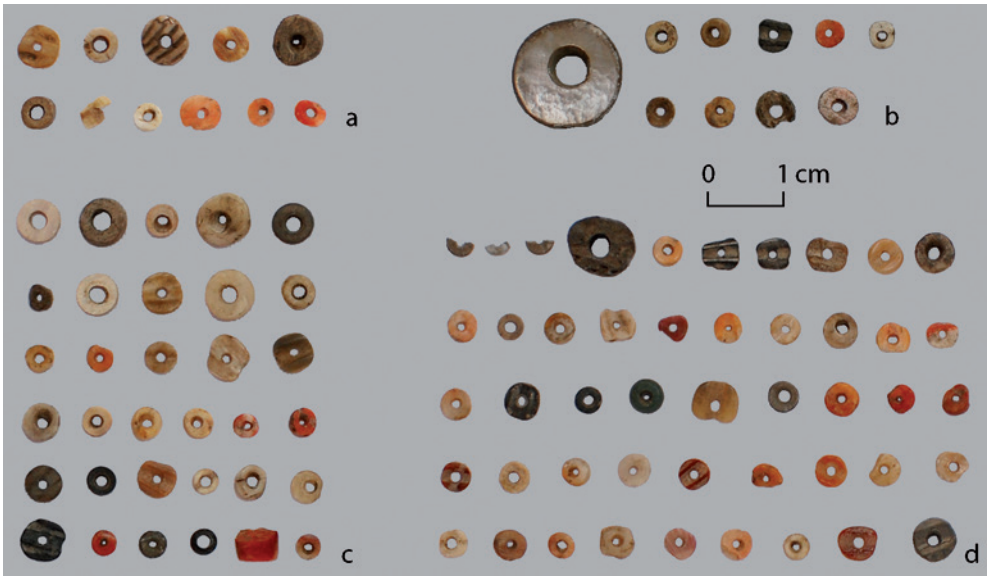


Fig. 18: The diversity of discoid beads from phase four contexts. a: Unit 25 Level 2. b: Unit 22 Level 1. c: Unit 22 Level 3. d: Unit 22 Level 2. (Photo: E. Dyrdahl)

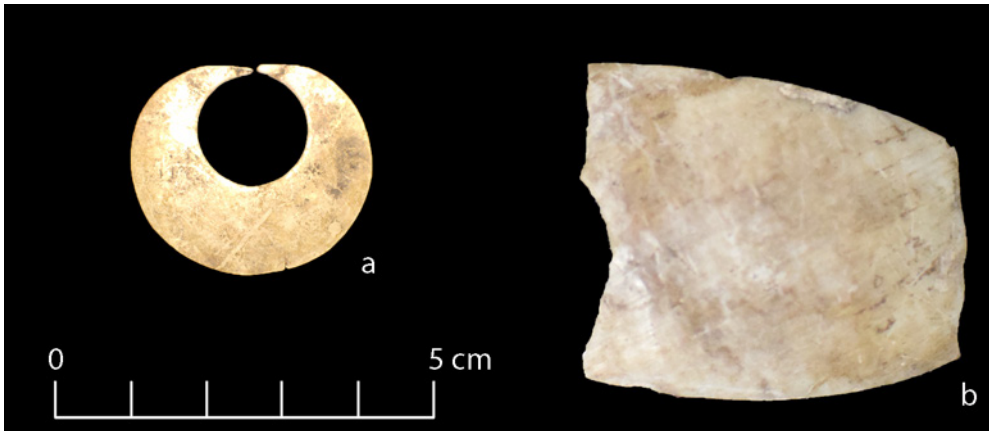


Fig. 19: a: A nariguera made from a gold-copper alloy found at Las Orquídeas. b. Fragment of a Megalobulimis sp. spoon recovered during excavations at Las Orquídeas. (Photos: E. Dyrdahl)

Las Orquídeas offers additional details and indicates that most first millenium BC artifact assemblages in the region likely include abundant evidence of non-local contacts. Unfortunately, for many reasons, including the lengthy history of volcanic eruptions in the region (Cordero Ramos 2017), archaeologists have not yet found other sites.

71 In his doctoral dissertation, Dyrdahl (Dyrdahl 2017) argued that rather than something akin to the ethnohistorically documented *mindala* traders (Salomon 1986; Salomon 1987) that might be represented on Late Formative ceramic vessels known as *canasteros* that have been found in the northern highlands (Valdez 2008: 873-874), the evidence from Las Orquídeas is more suggestive of a gift economy somewhat comparable to the system Rappaport (Rappaport 1967; Rappaport 2015) identified when studying the Tsembaga in New Guinea. Models developed based on our knowledge of this

Fig. 20: a: Bone instrument with broken handle. b: Wichuña bone tool (see Stahl – Athens 2001: 172). c: Bone awl. d: Slate tool with handle. e: Fragment of an andesite bowl. (Photos: E. Dyrdahl)

system, as well as many others, could help us understand why these objects continued in circulation and were exchanged in important social events rather than being interred as grave goods. People also would have moved between sites and regions in this system, and the distinct diet of the young female individual found at Las Orquídeas potentially is evidence of this (Torres Peña 2018).

72 However, the gift economy model does not entirely explain the craft production component of the Late Formative network and its evidence for raw material exchange. Crafting for participation in gift economies can take many forms and does not necessarily include acquistion of non-local raw materials. With this in mind, the most recently acquired data acquired from Las Orquídeas are key. Based on the evidence of *Spondylus* crafting primarily in the form of red cylindrical beads that are a very minor

component of the finished adornment assemblage, it appears that the finished adornments found on site (mainly purple cylindrical beads and red/orange discoid beads) probably were made elsewhere.

73 If accurate, this pattern would be indicative of a craft production and gift exchange system in which there is consensus that certain raw materials are valuable and acceptable for jewelry production. The variation between the jewelry produced on site (identified via *chaîne opératoire*) and the finished jewelry artifacts suggest that it is possible that the inhabitants of each site in the network produced a particular form of jewelry with each raw material that differed from the forms produced at other sites. In this case, it is possible each participant in the network could identify each form of jewelry for a specific raw material with a particular group. Value and meaning therefore would have been embedded in this jewelry in part because of where and by whom it was produced, inextricably linking production activities and social life (Costin 2016: 5). In this system, the jewelry that you wore to important events would indicate to everyone else who your allies were. In other words, you would be wearing your allegiances.

74 More evidence is needed to assess this idea. The lack of detailed studies of craft production and interregional interaction for first millennium BC Ecuador limits the ability to refine or modify the argument. Late Formative Chorrera ceramics from the Ecuadorian coast often are considered the pinnacle of artistry in prehispanic Ecuadorian ceramics (Cummins 2003), yet little is known about Chorrera and its variants (particularly Engoroy) beyond a few sites, with one important example being the ceremonial site at Salango (Lunniss 2008; 2021). Many of the offerings from Salango are made from raw materials that also are found at Las Orquídeas (e.g. *Spondylus*, mother-of-pearl, armadillo scutes, greenstone) and/or have a form (especially a tusk or fang-like shape) comparable to objects found at Las Orquídeas. Beyond Salango, one important data point that might provide supporting evidence is the documentation of *Spondylus calcifer* valves at the contemporaneous (900 – 300 cal BC) site of Ma-Lan in Machalilla, Manabí, by Prümers and Ugalde (Prümers - Ugalde 2018), that might represent the initial stages of a *chaîne opératoire* for the fabrication of purple cylindrical beads from *Spondylus calcifer*. Alongside this *Spondylus calcifer* waste, there is little to no evidence for crafting *Spondylus princeps*. Ultimately, much more work remains to be done in many regions to better understand the unique social network of the first millenium BC in Ecuador.

Conclusion

75 The first millennium BC occupation at Las Orquídeas and the long-distance network its inhabitants participated in arguably represent the most distinct evidence of interregional interaction in a region famous for it in prehispanic times. In total, more than 30 distinct raw materials have been identified, and for a great number of these, there is evidence for crafting on site. It is clear that craft production, of which at least some was undertaken with the objective of participating in the discussed social network, was an important component of life between 800 – 400 cal BC in the northern Ecuadorian sierra.

76 Unfortunately, while this is clear from the described refuse deposits and probable crafting area, the lack of domestic structures makes it difficult to analyze how crafting activities were structured within the community. Much of the site has been destroyed by recent housing developments, but the protection of a few key spaces (including the eucalyptus forest mentioned earlier) is critical to possibly finding the types of contexts that will lead to a greater understanding of how crafting and long-distance interactions articulated with other components of life during the first millennium BC in the northern Ecuadorian sierra.

77 Beyond further excavations in search of domestic contexts, future research at Las Orquídeas will analyze every component of the craft production assemblage. Studies will be presented on other raw materials including metals, animal bone, paleobotanical remains, stone bowls, the land snail *Megalobulimis* sp., and slate. These studies have the objective of characterizing the crafting technologies employed to work different raw materials and analyzing how they overlap, complement, and influence one another (Shimada 2020). Ultimately, the development of detailed information regarding these artifacts is necessary to promote greater consideration of Ecuadorian examples in debates on long-distance interaction and craft production, especially considering that Las Orquídeas likely will be a primary case study for these themes in Ecuadorian archaeology.

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