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RESEARCH REPORT

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New Insights on the Oldest Lithic Assemblages of the Tibitó and El Abra Sites (Sabana de Bogotá, Eastern Cordillera, Colombia)

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ABSTRACT

In this paper we present a review of the oldest lithic assemblages of Tibitó 1, El Abra 2, and El Abra 3 (Sabana de Bogotá, Eastern Cordillera), among the oldest and most significant sites in Colombia. The contribution of use-wear analysis on a controlled sample of materials confirms and adds new data to our previous technological review Muttillo et al. (2017. "Revisiting the Oldest Known Lithic Assemblages of Colombia: A Review of Data from El Abra and Tibitó (Cundiboyacense Plateau, Eastern Cordillera, Colombia)." *Journal of Archaeological Science: Reports* 13: 455–465). The results highlight some critical points and discrepancies with previous studies and interpretations.

KEYWORDS

Colombia; Pleistocene; hunter-gatherers; lithic technology; use-wear analysis

1. Introduction

The sites of Tibitó 1, El Abra 2, and El Abra 3, the object of our revision here, are located in the Sabana de Bogotá (on the Eastern Cordillera), a short distance from each other, at about 2600 meters above sea level (masl) (Figure 1(A)). These sites are among the most ancient and significant sites of Colombia, traditionally considered reference-sites for the entire South American continent.

Tibitò 1 (Zipaquirá, Cundinamarca Department) is an open-air site excavated in 1979–1980. In a stratigraphic sequence of several levels, two anthropic levels (named unit 3 and unit 3A) have been identified (Figure 1(B)). They yielded lithic and faunal remains, mainly American horse (*Equus* sp.) and deer (*Odocoileus virginianus*) but also extinct megafauna (*Haplomastodon* sp. and *Cuvieronius hyodon*). The only date for the site is a radiocarbon age obtained on a bone from the unit 3A, 11,740 ± 110 ^{14}C yr BP. The lithic industry, made from chert, is mostly composed of flakes, fragments of cores, and, only to a lesser extent, retouched tools (Correal 1981, 1982).

Our recent re-analysis of the lithic assemblages of Tibitó 1, however, from a technological point of view, have revealed the almost total absence of worked material: only nine possible flakes were identified among 154 pieces previously interpreted by Correal (1981) as flakes, broken cores, and retouched tools. Some doubts, though, remain depending on the incompleteness of some of these presumed flakes and the presence of deep pseudo-retouch, edge rounding, and patina. Such a small sample on a huge amount of pieces is not convincing and sufficient for statistical and interpretative purposes (Muttillo et al. 2017).

El Abra (Zipaquirá, Cundinamarca Department) was the first stratified site to be excavated in Colombia. It includes a series of rockshelters partially excavated between 1967 and 1969. Considering that the excavations of El Abra 1 and El Abra 4 were soon abandoned due to problems related to vandalism, here we consider only El Abra 2 and El Abra 3 rockshelters. The sites are located along a corridor between two parallel sandstone walls of Upper Cretaceous rocks (known as Rocas de Sevilla), part of the extinct Pleistocene lake that now corresponds to Sabana de Bogotá (Correal and van der Hammen 1977; Correal, van der Hammen, and Lerman 1969; Hurt, van der Hammen, and Correal 1972, 1977; van der Hammen 1991).

During the first year of fieldwork, in 1967, the excavation was carried out through nine artificial levels of 25 cm (top, level 1; bottom, level 9). During second year of fieldwork, in 1969, this was replaced by five major stratigraphic units (top, stratigraphic unit E; bottom, stratigraphic unit A) (Figure 1(B)). Stratigraphic units C, D, and E yielded anthropic evidence covering an age that spans from ca. 12,400 ^{14}C yr BP to historical times. Although there is no precise correspondence between

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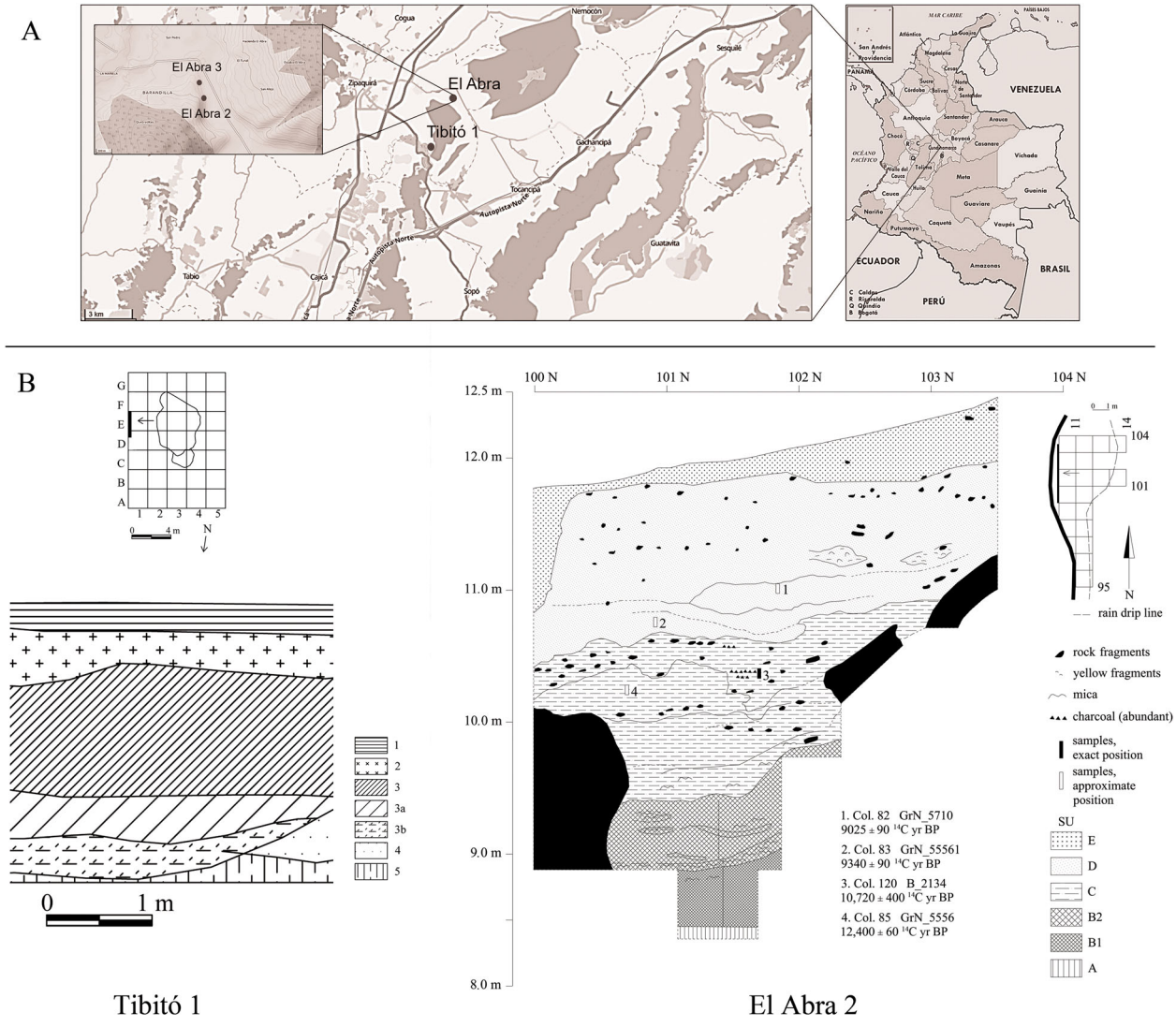

Figure 1 (A) Geographic location of the Tibitó 1, El Abra 2, and El Abra 3 sites in the Sabana de Bogotá (Colombia). (B) Stratigraphic sequence of Tibitó 1, from Correal (1981) (left), and stratigraphic sequence of El Abra 2, from Hurt, van der Hammen, and Correal (1977) (right).

the artificial levels and stratigraphic units, the oldest artificial levels 6, 7, 8, 9 should correspond approximately to stratigraphic unit C of the 1969 fieldwork.

In the oldest levels of the sites a small lithic assemblage was recovered, composed of simple flakes without any diagnostic tools, and there was some doubt of intrusion from the upper levels (Hurt, van der Hammen, and Correal 1977). Moreover, in the oldest levels, no faunal remains were recovered.

The oldest available date for El Abra 2 is 12,400 ± 160 ^{14}C yr BP, from charcoal mixed with soil assigned to level 7 of the first year's scheme, which should correspond to subunit C3. The oldest date for El Abra 3 is 8810 ± 430 ^{14}C yr BP, from charcoal mixed with soil assigned to subunit D1; however, there was some uncertainty pointed out by the original excavators (Hurt, van der Hammen, and Correal 1977, 8), due to the absence of an accurate stratigraphic control during the excavations and a confident interpretation of the stratigraphic sequence.

2. Lithic technological analysis

Our re-analysis of the lithic assemblages of El Abra 2 and El Abra 3 has revealed a prevalence of unworked material in the oldest levels, mostly sandstone geofacts plausibly resulting from natural detachment from the wall of the rockshelter. The worked material is extremely scarce (El Abra 2 = six artifacts; El Abra 3 = 16 artifacts), and these come from the most recent levels, i.e., from level 6 of El Abra 2 and from level 7 of El Abra 3 (Table 1). No worked material has been identified in level 7 of El Abra 2, dated to 12,400 ^{14}C yr BP, leading to a critical reconsideration of the oldest available date for this site (Muttillo et al. 2017).

Table 1 Material from the oldest levels of Tibitó 1, El Abra 2, and El Abra 3, used in the technological (from Muttillo et al. 2017) and use-wear analyses.

Sites	Tibitó 1			El Abra 2					El Abra 3				
Unit/level	3	3A	Total	6	7	8	9	Total	6	7	8	9	Total
Flakes	3	6	9	5	–	–	–	5	7	5	–	–	12
Cores	–	–	–	–	–	–	–	–	1	–	–	–	1
Retouched tools	–	–	–	1	–	–	–	1	–	3	–	–	3
Indeterminable fragments	1	1	2	2	–	–	–	2	4	2	–	–	7
Geofacts	11	128	139	11	8	5	4	28	10	17	18	–	44
Natural blocks	2	2	4	–	–	–	–	–	–	–	–	–	–
Total	17	137	154	19	8	5	4	36	22	27	18	–	67
Number for use-wear analysis	6	25	31	6	3	2	3	14	4	6	1	–	11

*Considering gaps in documentation and generalized absence of labeled pieces, the review was conducted exclusively on pieces clearly identified and ascribable to the stratigraphic sequence. For El Abra 2 and El Abra 3 we refer exclusively to the first year of fieldwork.

3. Lithic use-wear analysis

Based on the results of our previous technological revision of the oldest lithic assemblages of Tibitó 1, El Abra 2, and El Abra 3 (Muttillo et al. 2017), we decided to deepen the study and to add more data for interpretation. A controlled sample of pieces was selected for use-wear analysis (Table 1), worked (i.e., possibly human produced) and unworked (i.e., naturally produced) materials which presented morphologies suitable for grip and use, to verify if modifications present on the edges of the pieces were compatible with use or with post-depositional alterations, especially trampling (e.g., Flenniken and Haggart 1979; McBrearty et al. 1998; Shea and Klenck 1993) and edge rounding (e.g., Asryan, Ollé, and Moloney 2014; Levi Sala 1986; van Gijn 1990; Venditti, Tirillò, and Garceac 2016).

The study was conducted using the low-power approach (Odell 1981; Semenov 1964; Tringham et al. 1974), through the use of a digital Dinolight Am413 T (5-230×) microscope. The low-magnification approach is the most useful in this case as it deals with the distribution and shape of edge-scarring, allowing us to determine what the trace present on a lithic instrument can be attributed to (Asryan, Ollé, and Moloney 2014; Bird, Minichillo, and Marean 2007; Lemorini et al. 2014; Mazzucco et al. 2013; McPherron et al. 2014; Tringham et al. 1974).

Thirty-one pieces from Tibitó 1 were analyzed from a functional perspective (Table 1), of which 25 were unworked pieces and six were presumed worked pieces (i.e., possibly human produced) (including five flakes, one of which was fractured and two were incomplete). All the pieces, made of chert, came from level 3A ($n = 25$) and level 3 ($n = 6$). Twenty-nine showed evident signs of post-depositional alterations along their edges (deep pseudo-retouching features due to intense trampling) (Figure 2(B–C)) and intense rounding of the edges (Figure 2(A–C)). Traces due to post-depositional phenomena were easily recognizable because they were randomly distributed on the surfaces of the artifacts (even in the areas distant from the edges) (Lemorini et al. 2014; Shea and Klenck 1993).

Only one piece did not show any evidence of alterations along the edges. Another supposed worked piece, although it bore a crack with a punctiform base (typical of post-depositional processes), had two traces with characteristics suggestive of longitudinal use on hard material. This piece also had a "snap" fracture in the distal area (tip) (Figure 2(C)). Unfortunately this type of fracture can be associated with both use and post-depositional processes (Fischer, Hansen, and Rasmussen 1984; Lombard, Parsons, and Van Der Ryst 2004). Thirty of 31 pieces did not show evidence of use, including finds identified as flakes (Figure 2(A)). It is interesting to note that not even the presumed flakes showed breakages along the edges ascribable to their use as artifacts. This puts in doubt the effective anthropic nature of these finds, considering that most of them are incomplete or broken. In eight cases, a second "phase" of post-depositional alteration was recognized, superimposed over the first phase and with characteristics similar to the previous one.

Fourteen finds from El Abra 2 were analyzed through use-wear analysis (Table 1), the majority of which are geofacts of sandstone ($n = 12$), plus a fractured flake and a retouched blank of chert. None of these were found to have traces due to use, not even the two possible artifacts. However, most of the finds had slight traces of trampling, and half of them had slight edge rounding (Figure 2(D–E)).

Eleven finds from El Abra 3 (of sandstone, siltstone, and chert) were analyzed (Table 1). On none of the selected finds was it possible to identify traces resulting from intentional use. Instead only traces related to trampling (in most of the cases) (Figure 2(F–G)) and edge rounding were noted. Not even the worked pieces showed traces of use, but they did bear slight features from trampling (Figure 2(G)).

Figure 2 Microscopic study of some pieces from Tibitó 1, unit 3A (A–C); El Abra 2, level 6 (D–E); El Abra 3, level 7 (F–G). Magnification 50×. No find presented traces of use, but post-depositional alterations, such as trampling (B–G) and edge rounding (A–E) were noted. C and G present a "snap" fracture in the distal area (tip).

4. Discussion and conclusions

To summarize, use-wear analysis conducted on the sample from Tibitó 1 has detected traces exclusively referable to abundant and evident post-depositional alterations, especially trampling and edge rounding. No finds show traces of retouching; and they do not even show traces attributable to use. Not even the possible anthropic products were used, which leads us to reconsider the anthropic nature of the site. Use-wear analysis conducted on the samples from El Abra 2 and El Abra 3 did not detect any traces attributable to intentional use, either on the worked or unworked material. The only traces identified are related to slight post-

depositional alterations, such as trampling and, to a lesser extent, edge rounding.

Considering our review of the lithic industries, the human presence in the El Abra rockshelters could be more recent than assumed since the 1970s; while the human presence in Tibitó 1 should now be based solely on the presence of intentionally fractured bones, a bone with incisions, and a fragment of a scapula with a rupture caused by a lithic tool (Correal 1981), which we have not yet analyzed. In conclusion, considering the importance of these sites for understanding the early human settlement of Colombia, it will be necessary to return and more extensively re-excavate them and to re-date them using the most current and accurate methodologies and techniques.

Disclosure statement

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