

Old and modern volcanic depictions as evidence of communities-volcanoes mutualism in Colombia

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ABSTRACT. Studying the different ways in which the concept of volcanism is represented is crucial in the understanding of communities' perception of the volcanic phenomena. In this contribution, 129 modern (2021-2023) depictions of volcanoes in Colombia between latitudes 0.82 and 5.96° N are described and classified into different contexts of use. Prehispanic depictions of volcanism are investigated in rock art sites (3 pictographs and 33 petroglyphs), and 15 distinct mythical narratives compiled and confirmed through interviews in the State of Nariño. We suggest that many of the rock art sites contain motifs that are reminiscent of the idea of volcanism, and that many of the folk tales include allusions to the volcanic concept. By collating the information contained in modern and older depictions, a link is established with the reality of the volcanic phenomena that shows how mutualism takes root between communities and volcanoes. The beneficial aspects derived from this relationship influence the perception of volcanic hazards in the region.

Keywords: Volcanoes of Colombia, Modern depictions, Nariño, pictographs, Petroglyphs, Myths and legends.

RESUMEN. Representaciones volcánicas viejas y modernas como evidencias de mutualismo comunidades-volcanes en Colombia. El estudio de las diferentes maneras mediante las cuales se representa el concepto de volcanismo es crucial en el entendimiento de la percepción de los fenómenos volcánicos. En este trabajo, un grupo de 129 representaciones modernas (2021-2023) de volcanes en Colombia entre las latitudes 0,82 y 5,96° N es descrito y clasificado en diferentes contextos de uso. Representaciones prehispánicas de volcanismo fueron investigadas en sitios de arte rupestre (3 pictógrafos y 33 petroglifos) y 15 diferentes narraciones míticas compiladas y confirmadas con entrevistas en el Departamento de Nariño. Muchos de los sitios de arte rupestre contienen motivos que son reminiscentes de la idea de volcanismo, y muchos de los mitos y leyendas contienen alusiones al concepto de volcán. Al agrupar la información contenida en las representaciones modernas y viejas, se establece un vínculo con los fenómenos volcánicos que muestra cómo este mutualismo se arraiga entre las comunidades y los volcanes. Aspectos benéficos derivados de esta relación es probable que influyeran la percepción de las amenazas volcánicas en la región.

Palabras clave: Volcanes de Colombia, Representaciones modernas, Nariño, Pictógrafos, Petroglifos, Mitos y leyendas.

1. Introduction

1.1. Importance and objective of the study

Graphic and narrative depictions of volcanism are a window to the cosmic vision of their authors, revealing not only individual or collective perception of the natural landscape but also psychological, social, and cultural aspects that influenced the creation of the artwork or the folklore expression. By analyzing artistic manifestations depicting volcanoes, we have access to the way of thinking of the inhabitants within the influence areas. A main objective of this work is thus to study modern (paintings, murals, advertisements) as well as old (pictographs, petroglyphs, myths) forms of volcanic depictions, to get insight into the mutualistic relationship that is established between humans and volcanoes. This, in turn, allows for a further understanding of how volcanic hazards are perceived.

1.2. Colombian volcanism

In southwestern Colombia, the Andes branch out to form three mountain ranges, named Eastern, Central, and Western Cordilleras (Fig. 1). Volcanoes between latitudes 0.82-5.96°N occur along all these three ranges, although Holocene activity has taken place only at centers located in the Central and Western Cordilleras (Servicio Geológico Colombiano, 2023). The degree of knowledge about the precise ages of eruptions varies from place to place, but 25 volcanoes have so far been determined as active during historical times (Monsalve-Bustamante, 2020). If the known older, inactive, or age-undetermined volcanic centers are also taken into consideration, the number of volcanoes in the study area exceeds a hundred (Robertson *et al.*, 2002) (Fig. 1). The spatial distribution of active volcanoes forms three arc segments limited by fault systems, termed southern, central, and northern, each with distinctive details in the numbers of volcanoes and their eruptive frequency (Monsalve-Bustamante, 2020). The southern volcanic segment only has four volcanic complexes, bounded by southerly Chiles-Cerro Negro Complex and northerly Galeras Volcanic Complex (GVC). The latter has evolved over roughly one million years, being Galeras its youngest center. Galeras volcano grew inside of the amphitheater left by the catastrophic sector collapse of its predecessor, Urcunina volcano,

~12 to 5 kyr ago (Calvache, 1995). Galeras has a rich history of eruptions, with major events 4.5, 4, 2.9, 2.3, and 1.1 ka BP, and a big historical eruption in the year 1866. The central volcanic segment has six composite volcanoes, five of which have dome complexes and one is actually a dome built on the remnants of an old caldera. The southernmost volcano of the central segment is Doña Juana and the northernmost is Nevado del Huila. The Coconucos Volcanic Chain, in the center of this segment, is formed by 15 vents aligned NW-SE and includes active Puracé volcano (Samacá and Sánchez, 2018). The northern volcanic segment holds ten volcanoes along the Central Cordillera plus four monogenetic volcanoes located off the axis of the cordillera. The best-known volcano of the northern segment is Nevado del Ruiz, a large composite volcano which erupted in 1985 generating lahars that caused near 25,000 fatalities (Thouret *et al.*, 1990; Ceballos-Hernández *et al.*, 2020).

Apart from the composite volcanism summarized above, there are also many monogenetic volcanoes located preferentially east of the active front. These include at least 51 relatively small volcanoes with a diversity of structures such as domes, scoria cones, single lava flows, and maars, grouped formally into six monogenetic volcanic fields (Botero-Gómez *et al.*, 2018; Monsalve-Bustamante *et al.*, 2020). North of 5.6° N there has been no recent monogenetic volcanism, with activity likely occurring during the upper Miocene in a number of centers with mainly andesitic chemistry (Grosse, 1926; Calle and González, 1980; Velásquez *et al.*, 2021). Nonetheless, the morphologies, lithologies, and field relationships of centers like Cerro Tusa, Cerro El Sillón, or Cerro Bravo, located further north in the Antioquia State (Fig. 1), may indicate the existence of one or several yet-to-be-defined monogenetic fields.

The volcanoes mentioned in this work include, from south to north: Chiles-Cerro Negro Volcanic Complex (Perdomo *et al.*, 1986; Cortés and Calvache, 1996; Telenchana, 2017); Azufral Volcanic Complex (Williams *et al.*, 2017; Castilla *et al.*, 2019; Moreno-Alfonso *et al.*, 2021); Galeras Volcanic Complex (Calvache, 1990; Calvache *et al.*, 1997; Cepeda, 2020); Puracé Volcano (Patiño and Monsalve, 2019); Cerro Machín (Rueda, 2005; Murcia *et al.*, 2008; Laeger *et al.*, 2013; Cortés-Jiménez, 2020); Nevado del Tolima (Thouret *et al.*, 1995); Nevado Santa Isabel Dome Complex (Monsalve-Bustamante, 2020);

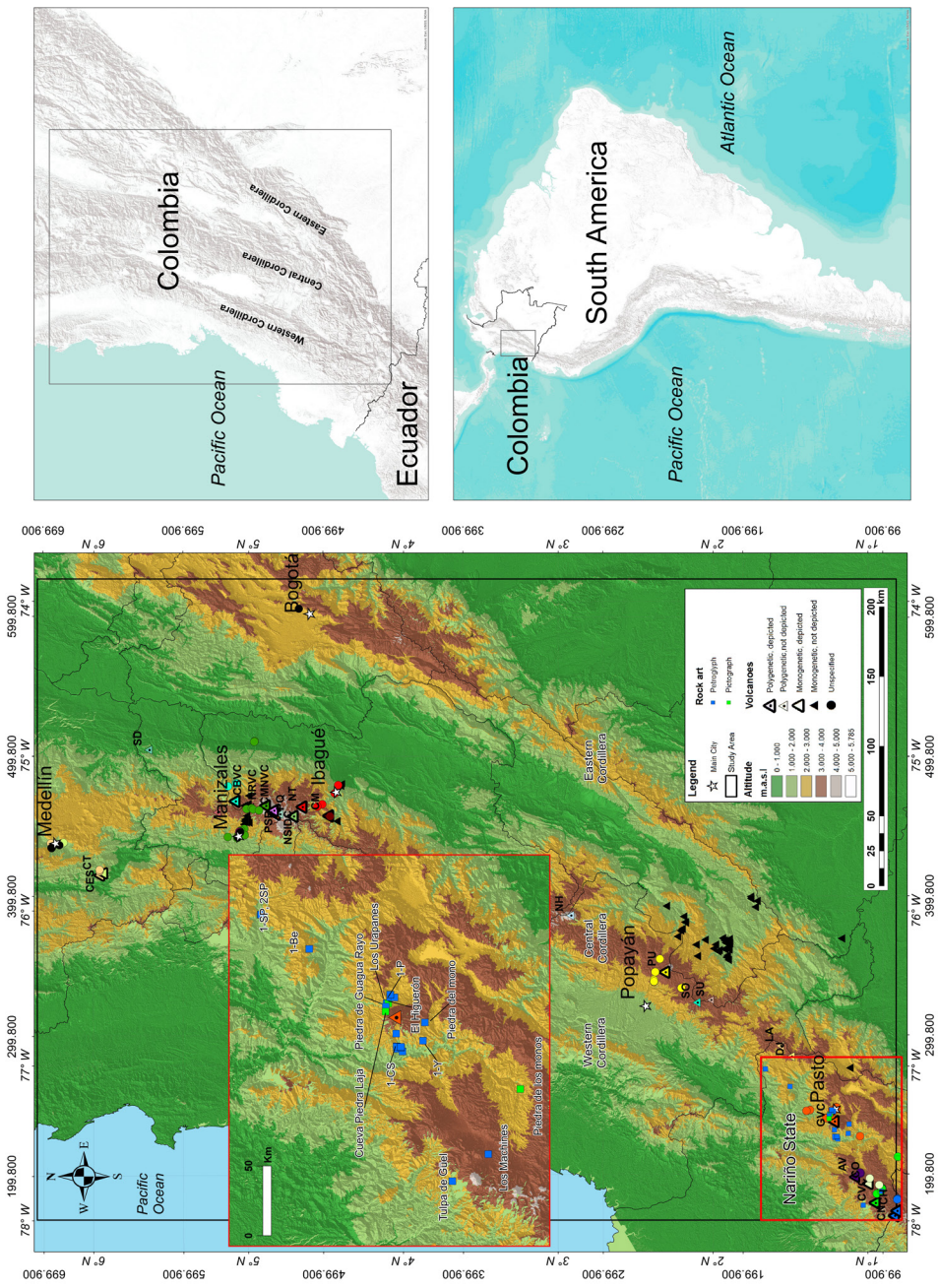


FIG. 1. Location map showing the volcanoes and sites where depictions (colored circles) have been documented. The color of a given circle matches with the color used for the volcano depicted (black circles used for depictions of unspecified volcanoes). The inset zooms into the State of Nariño where rock art (pictographs and petroglyphs) sites are located. From south to north: CN=Cerro Negro, CH=Chiles, CVC=Cumbal Volcanic Complex, CO=Colimba, AV=Azufral Volcano, GVC=Galeras Volcanic Complex, DJ=Dofia Juana, LA=Las Animas, SU=Suicubún, SO=Sotará, PU=Putacé, NH=Nevado del Huila, CM=Cerro Machín, NT=Nevado del Tolima, NSIDC=Nevado Santa Isabel/Dome Complex, PQ=Paramillo del Quindío, PSR=Paramillo de Santa Rosa, CMNV=Cisne-Morro Negro Volcanic Complex, NRV=Cerro Negro Volcanic Complex, CBVC=Cerro Bravo Volcanic Complex, SD=San Diego, CES=Cerro El Sillón, and CT=Cerro Tusa.

Nevado del Ruiz Volcanic Complex (Herd, 1974; Thouret *et al.*, 1990; Ceballos-Hernández *et al.*, 2020); and Cerro Bravo Volcanic Complex (Lescinsky, 1990; Monsalve, 1991).

1.3. Volcanic depictions

Volcanoes, whether active or not, are usually imposing terrain features that inspire awe and instill fear in the minds of the inhabitants of their surroundings. Active volcanic edifices and volcanic complexes are landmarks difficult to miss, and when magma approaches the surface and erupts, the processes that result, apart from being hazardous, are observed by onlookers near and far. In this way, representations of volcanism and volcanic landscapes appear in many forms: news spread, stories are told, songs and anthems are composed, and graphic images (depictions) of volcanoes and their activity are sculpted or drawn so the human feelings, emotions or ideas can be communicated.

Around the world there are many instances of ancient depictions of volcanoes, especially those that have been observed during eruptions, some examples include the 30,000-40,000 years-old painting found in the Chauvet-Pont d'Arc cave in southeastern France, showing explosive volcanic activity likely occurring in the Bas-Vivarais area, some 35 km to the northwest (Nomade *et al.*, 2016); the >7,000 years-old petroglyph showing the eruption of Porak Volcano in the Syunik region of Armenia, found ~9 km southeast of the volcano (Karakhanian *et al.*, 2002); the >8,000 years-old painting found in Çatalhöyük, Turkey, likely representing active Mt. Hasan, located roughly 120 km away (Mellaart, 1964a, b; Mellaart, 1967; Harris, 2000; Meece, 2006; Rochberg, 2014; Schmitt *et al.*, 2014); and, more recently, the ~4,700 years-old Kanlıtaş pictograph in western Turkey, interpreted as representing erupting Çakallar volcano, some 2 km to the northeast (Akal *et al.*, 2009; Akdeniz, 2011; Ulusoy *et al.*, 2019).

In South America, particularly in Colombia, many modern depictions of volcanoes appear in multiple contexts (*e.g.*, used and shown in many daily-life aspects), from history and government to economy and commerce (Sánchez and Calvache, 2018; Calvache and Sánchez, 2022). Pre-Hispanic depictions of volcanoes, at least those that are figurative, are, however, scarcer. Here we 1) study the modern figurative depictions of volcanoes to

understand the way communities relate to these potentially hazardous landforms, and 2) study the oldest known figurative volcanic depiction, and 3) make inferences about alternative ways (not figurative) in which volcanoes could have been represented in Colombia.

1.4. Background on figurative volcanic depictions in Colombia

Modern graphic representations of volcanoes in Colombia vary in type, spatial character (local, regional), temporal nature (short-lived, long-lasting), amount of representations, and also in the way they are used (context, purpose). A recent survey by Sánchez and Calvache (2018) reported that 19 volcanoes (including both dormant and active centers) were depicted in 71 localities, mostly in neighboring zones. This survey has been updated and new data are shown in the present work (Fig. 1). More recently, Calvache and Sánchez (2022) focused on seven volcanoes in the State of Nariño (southwestern Colombia) and found that more than half of the depictions related to art, culture, and music themes. For the span of time that these recent datasets cover (~1,558-2020 CE), and considering that just the two aforementioned studies together reported on nearly 500 observations, modern depictions of volcanoes in Colombia abound.

Older depictions, however, are more elusive. The “El Higuérón” pictograph, reported near the locality of Genoy (Nariño) includes a sketch of what purportedly shows Galeras volcano in activity (*e.g.*, see Cabrera, 1966; Granda, 1983; Quijano, 2007). This drawing was made on the surface of a columnar-jointed lava on the eastern flank of the Galeras Volcanic Complex, and here we present some ideas about the age of the El Higuérón pictograph as well as some implications regarding the relationships that arise between volcanoes and their surrounding communities.

The scarcity of old figurative depictions of volcanism in a territory with that many volcanic centers is in sharp contrast with the abundance of pictograms and petroglyphs. We speculate that the symbols and sketches contained therein could be abstract representations of landscapes features, including volcanoes. Likewise, there is a wealth of legends and myths that could arguably include allusions to volcanoes and eruptions. We explore

this tantalizing possibility by presenting data from literature search and field surveys.

2. Data and methods

Recent (2021-2023) depictions of volcanism were investigated in this study within northern latitudes 0.8-6.4° (Fig. 1). The southernmost volcano within the study area is the Chiles-Cerro Negro Volcanic Complex, part of the international limit between Colombia and Ecuador, and the northernmost is Cerro Tusa, near the municipalities of Venecia and Fredonia. These recent depictions were located by means of (1) scheduled itineraries through rural and urban localities around volcanoes; and (2) systematic online inquiries in authoritative sources (mainly the official internet pages of institutions), search engines queries, and electronic mail communications to crosscheck specific or detailed information. For every graphic image of a volcano found, a set of high-resolution photographs was taken and, whenever possible, the following basic data were recorded: date for when the depiction was found, location, preliminary classification (*i.e.*, stating whether it was a mural, or a canvass painting, etc.), identification of the volcano depicted, date of creation, and authorship. The best photos were selected considering their resolution, illumination, completeness, and perspective, and were archived for reference. A total of 129 depictions showing a total of 20 volcanoes were documented and classified into a variety of contexts following Sánchez and Calvache (2018) and Calvache and Sánchez (2022) (see Supplementary material 1 for details). The joint data set, which considers the newly documented cases shown in this work plus those of the aforementioned authors (which cover the period ~1558-2020), totals 623 modern depictions of the concept of volcanism in Colombia.

Older forms of depictions were studied in the State of Nariño in southwestern Colombia (Fig. 1). Some of these represent, arguably, abstract constructs of the idea of volcanism camouflaged within pictographs, petroglyphs, and folkloric genres such as myths and cosmogonic beliefs. To collect these data, appropriate literature was reviewed with a two-fold purpose: to gather authoritative information on rock art around volcanic areas in Nariño, and to find cases of autochthonous folk tales, myths and legends. Whenever a rock art site or a myth was identified, key information was stored depending on the type of

representation. For rock art sites, 15 characteristics were sought to provide the most complete, yet concise description of the artwork (Supplementary material 2). For each myth, nine descriptive characteristics were used to build a reasonably succinct report (Supplementary material 3). When the literature search was nearing completion, we contacted several communities' leaders (elders, indigenous governors, landowners, local guides) to socialize the intention of traveling to their territories and secure permissions and guidance to document several sites. Also, it was possible to arrange interviews with locals, to collect their personal accounts on aspects related to the rock art sites, and get a sense of the local knowledge about myths and legends in the areas of interest.

Once the literature searches were finished, field campaigns were conducted to locate the depictions, verify the information, compile additional or missing details, document the occurrences (graphically or textually), and realize interviews in various localities. The field campaigns were conducted in October 2018 and December 2021 to visit eight selected sites that could be accessed and documented in as much detail as possible. To describe the sites, a two-page field survey (Fig. 2) was developed including all the attributes specified above (see Supplementary material 4 for results).

The literature searches and field campaigns resulted in a compilation of base information on 36 rock art sites (Supplementary material 2) and 15 distinct myths (Supplementary material 3).

3. Results

3.1. Modern depictions of volcanism

The updated data set on occurrences of modern graphic depictions is provided in the Supplementary material 1, with the information geographically organized and classified according to the context or the use of the volcanic images. The volcanoes depicted have outlines that can be approximated by either a triangle (56 depictions), a broken or zigzag line (47), or an arched line (15). Typically, the depictions for any given volcano were found within a ~20 km radius of its center, but for Cumbal, Nevado del Tolima, Nevado Santa Isabel, and Nevado del Ruiz volcanoes we found some representations at distances exceeding 650 km. The spatial extent

A

PREHISPANIC REPRESENTATIONS OF VOLCANOES IN NARIÑO
FIELD SURVEY FORM

Page 1

Name of site: Piedra de los monos pictograph. **Latitude:** 0.80560. **Longitude:** -77.59491. **Elevation:** 2611.
Municipality: Potosí. **Locality:** Frontales. **Farm:** **Proprietor:**
Geoform: Guaítara River canyon, vertical rocky cliff, mid-flank.
Conservation: Evidences of vandalism.
Access: From the Pasto-Genoy highway, follow a steep stone paved road on private property. Last 40 m to site there is no visible by-path, lots of brushwood, near-vertical slope.
Time of record: 12:51 **Weather:** Foggy, ocasionaly sunlit.

Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Basaltic andesites, fine-grained groundmass, columnar jointing.	50-m-wide, 20- m-high outcrop.	Red. Orange. Black.	NW-SE.	None.	Does not apply.	Does not apply.	Only from some sectors of the neighboring rural settlement.	Steep slopes of Guaítara River left bank.

Observations: Restricted Access and visibility. Evidences of a poorly-preserved second pictograph, site has been vandalized.

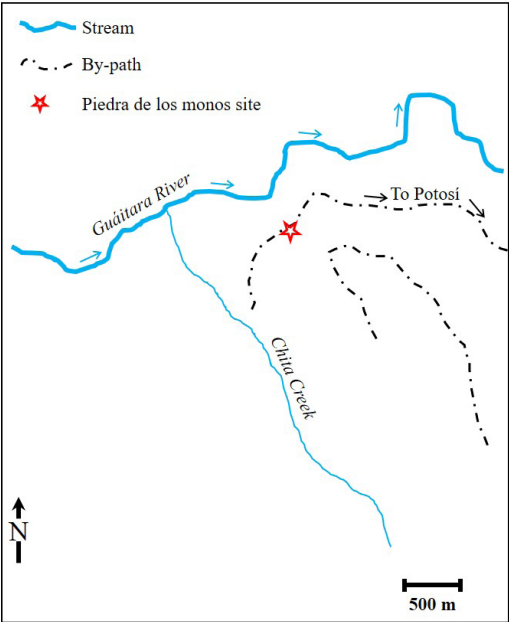
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B

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MAP



ROCK ART REPRESENTATION

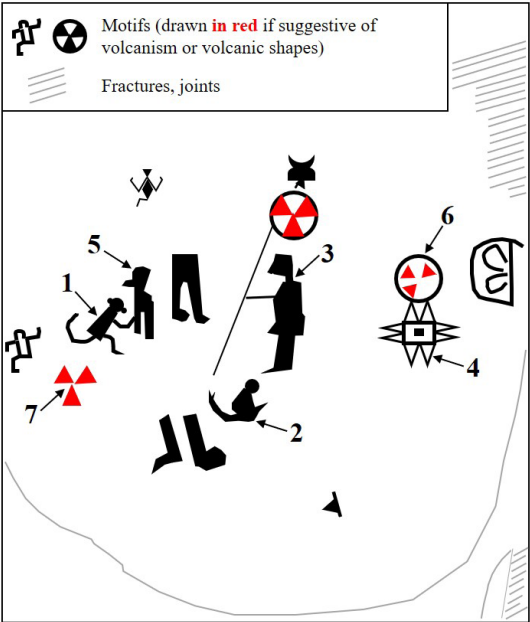




FIG. 2. Example of the format used to record information of rock art sites in the field. **A.** Information sheet for the *Piedra de los Monos* pictograph (Potosí municipality, southern Nariño). **B.** Basic location map and sketch with the motifs identified on the site. In this example: 1: Monkey looking at the observer; 2: Monkey in sitting position; 3: Anthropomorphic figure holding a spear or a cane; 4: The *Sol de los Pastos* symbol; 5: Anthropomorphic figure in profile; 6: Circle enclosing opposing triangles joined by apex; 7: Opposing triangles joined by apex. **C.** Photograph of the site. Numbers as in B.

of occurrences of depictions is much larger than previously documented and now includes cases as far north as 6.27°N in the city of Medellín, and near latitude 5.96°N (Fig. 1), where several inactive volcanic centers possibly formed a monogenetic field, although they have been traditionally conceived as shallow intrusive bodies (Grosse, 1926; González, 2001; López *et al.*, 2006; Jaramillo *et al.*, 2019). Of these, Cerro Tusa, a hill with a characteristic pyramid-like shape (likely a volcanic neck) is an iconic feature of the region, so important for the communities that it has been included in the flag and coat of arms of the municipality of Venecia (State of Antioquia) (Gobierno Municipal de Venecia, 2023)¹. Table 1 shows a summary of data on volcanic centers and volcanic complexes recently depicted in Colombia.

Out of the 129 modern depictions, we found 6 that did not show an image of the volcano but were mainly textual forms (5 explicitly mentioned the name of a volcano and 1 directly referenced the concept of volcano). For the 123 remaining images,

118 were figurative or naturalistic (~96%) and only 5 were abstract (~4%). Modern volcanic depictions are being used in 31 different contexts with strong emphasis in art, commerce, culture, decoration, heraldry, history, and tourism, and noticeably also in areas such as education, government, mythology, music, and philately (Fig. 3).

3.2. Older depictions of volcanism

The 36 rock art sites documented here include only pictographs (3 cases, ~8%) and petroglyphs (33 cases, ~92%), and no cases of petroforms or geoglyphs. Thirteen sites include motifs reminiscent of volcanism or of the volcano shape (*e.g.*, triangles, opposing triangles, or anthropomorphic features that personify the spirit of mountains according with oral traditions; see sites 1, 4, 5, 9, 13, 15, 21, 24, 26-28, 30, and 32 in Supplementary material 2), being typically located within ~17 km of the nearest volcano. Among the myths, legends and other stories, we found that

¹ Gobierno Municipal de Venecia. 2023. Venecia, tierra de la montaña sagrada. URL: <http://www.venecia-antioquia.gov.co/> (last accessed: July 26, 2023).

TABLE 1. SUMMARY OF DATA ON VOLCANOES AND VOLCANIC COMPLEXES* THAT ARE REPRESENTED RECENTLY (2018-2023) IN COLOMBIA, ORGANIZED BY LATITUDE, FROM SOUTH TO NORTH. SEE SUPPLEMENTARY MATERIAL 1 FOR PHOTOS AND ADDITIONAL INFORMATION ON ALL RECENT DEPICTIONS.

Name*	Latitude (°)	Longitude (°)	Elevation (m a.s.l.)	Type	State	Number of historical eruptions	Date of last eruption	Number of depictions and mentions (total of modern and older forms)**	References
Chiles	0.816	-77.936	4,748	Polygenetic	Active	Unknown	Possibly during 1860-1869.	7	Monsalve and Laverde (2016); Monsalve-Bustamante (2020).
Cerro Negro	0.831	-77.967	4,470	Polygenetic	Active	Unknown	Early XX century.	1	Monsalve and Laverde (2016); Monsalve-Bustamante (2020).
Cumbal	0.956	-77.885	4,764	Polygenetic	Active	Unknown	Possible dates: Early XIX century; December 1877; 20-21 December 1926.	21	von Humboldt (1800); Hantke and Parodi (1966); Monsalve-Bustamante (2020).
Colimba	0.999	-77.760	3,607	Monogenetic	Inactive	Unknown	-	3	von Humboldt (1800); André (1884);
Azufra	1.085	-77.717	4,070	Polygenetic	Active	-	~1740; XIX century; July 2009.	3	Boussingault, 1985; Gómez and Ponce (2009); Monsalve-Bustamante (2020).
Galeras	1.221	-77.359	4,276	Polygenetic	Active	Historical reports include at least 71 eruptive cycles, with hundreds of eruptive events.	2012	26	Monsalve-Bustamante (2020); Cepeda (2020); Smithsonian Institution, National Museum of Natural History (2023).
Puracé	2.313	-76.395	4,650	Polygenetic	Active	At least 34 eruptive cycles with more than 50 eruptive events.	2023	10	Monsalve-Bustamante (2020).

table 1 continued.

Name*	Latitude (°)	Longitude (°)	Elevation (m a.s.l.)	Type	State	Number of Historical Eruptions	Date of last eruption	Number of depictions and mentions (total of modern and older forms)**	References
Cerro Machín	4.487	-75.386	2,750	Polygenetic	Active	-	-	1	
Nevado del Tolima	4.659	-75.329	5,215	Polygenetic	Active	Possibly 6	1943?	12	Hantke and Parodi (1966); Thouret <i>et al.</i> (1985); Monsalve- Bustamante (2020).
Paramillo del Quindío	4.715	-75.389	4,700	Polygenetic	Active	-	-	1	-
Nevado de Santa Isabel	4.830	-75.375	4,965	Polygenetic	Active	-	-	2	-
Paramillo del Cisne	4.843	-75.352	4,700	Polygenetic	Active	-	-	1	-
Nevado del Ruiz	4.895	-75.321	5,321	Polygenetic	Active	At least 6 eruptive cycles with roughly 13 confirmed eruptions and many eruptive episodes.	2023	39	Espinosa (2012); Smithsonian Institution, National Museum of Natural History (2023).
Cerro Bravo	5.091	-75.292	4,000	Polygenetic	Active	1?	1805?	3	Lescinsky (1990); Espinosa (2012); Monsalve- Bustamante (2020).
Cerro El Sillón	5.945	-75.756	1,827	Monogenetic	Inactive	-	-	1	-
Cerro Tusa	5.964	-75.771	1,497	Monogenetic	Inactive	-	-	10	-

* Chiles and Cerro Negro volcanoes form the Chiles-Cerro Negro Volcanic Complex; Cumbal Volcanic Complex includes La Plazuela and Mundo Nuevo volcanoes; Galeras Volcanic Complex includes Urcunina and Galeras volcanoes; Nevado del Ruiz Volcanic Complex includes Nevado del Ruiz and La Olleta volcanoes.
** Based on Supplementary materials 1, 2, and 3.

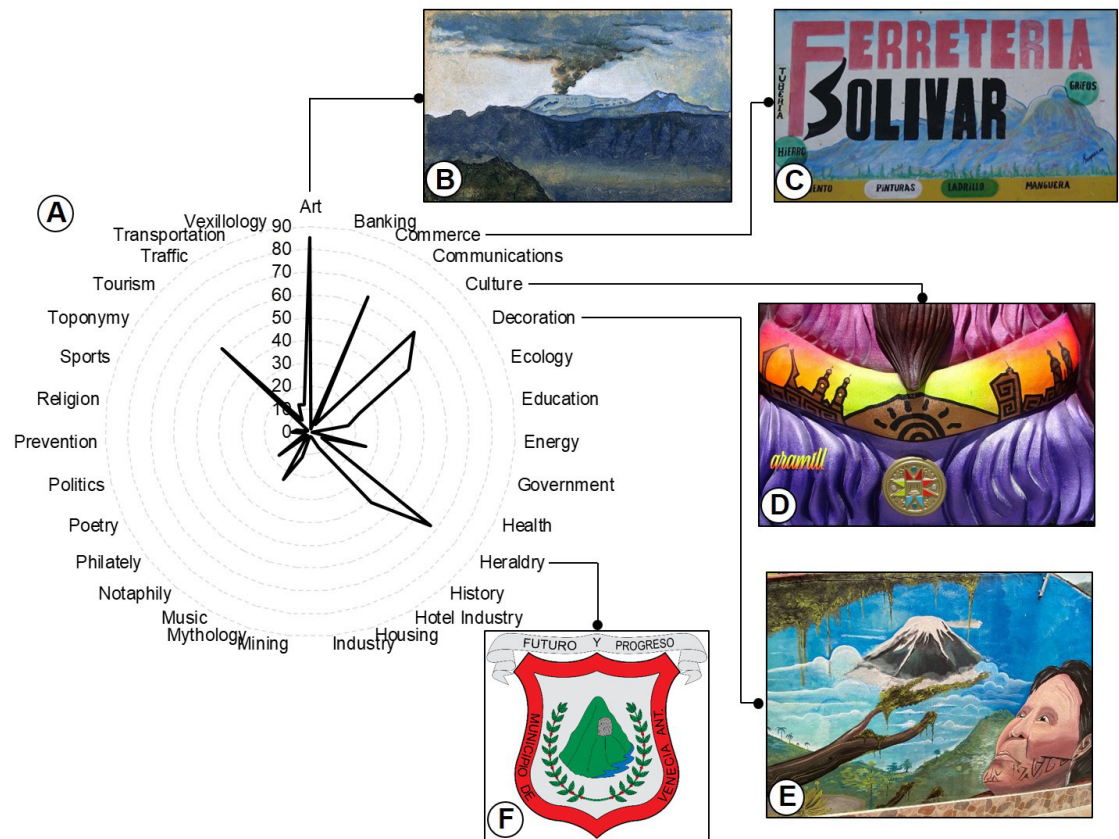


FIG. 3. A. Circular line-graph showing the number of observed occurrences of modern volcanic depictions (2018-2023) in Colombia, classified according to their context (Sánchez and Calvache, 2018; Calvache and Sánchez, 2022), with some examples. B. Art (watercolor on paper of the Nevado del Ruiz Volcanic Complex). C. Commerce (advertisement for a hardware store with the Cumbal Volcanic Complex in the background). D. Culture (fragment of a float built for the 2020 *Negros y Blancos* carnival in Pasto, Nariño, with Galeras volcano in eruption). E. Decoration (mural with snow-capped Nevado del Tolima volcano). F. Heraldry (coat of arms of the Venecia municipality, Antioquia, with monogenetic volcano Cerro Tusa). See Supplementary material 1 for details on all depictions reported.

12 out of 15 contain allusions to volcanism, volcanic mountains, volcanic products, or that explicitly mention names of volcanoes, mainly Galeras or Urcunina, but also Gualcalá Mount, Colimba, Doña Juana, and Cumbal volcanoes (numbers 2-5, 7-12, 14, and 15 in Supplementary material 3).

4. Discussion

Volcanic mountains have always been important to human beings for a number of reasons. For indigenous communities, volcanoes are usually seen as homes of deities (e.g., Montero, 2009; Sigurdsson, 2015) or a place of origin for the first humans or the ancestors, as well as the place where all the indigenous

inhabitants want to return at the end of life. Because volcanoes often form conspicuous mountains, they can be an important source of water and food for a large number of people. Also, volcanic materials can be used to make tools, crafts, and even large structures. Finally, volcanoes are dominant beautiful landscapes, landmarks, and places that draw people to live on their flanks. For all these reasons, people feel the need to give something in return for all benefits received: assigning volcanoes the status of sacred places; dedicating rituals and offerings (Glockner, 2009); demanding that these mountains are to be treated with the utmost respect; and looking out for them. This is the mutualistic relationship established that binds people and *their* volcanoes (*their*, because

communities see the volcanoes as their own) and that has existed for as long as humans abandoned their nomadic tradition to settle and take root on and around the mountains. In our study area, we see what could be called a dangerous contradiction: in communities like the Mapachico locality people acknowledge that Galeras volcano is dangerous, that in the past it has produced eruptions that have affected the land they live in, but at the same time they feel safe, because they strongly feel, that as long as they care for the volcano and the environment, everything will be all right (Enríquez, 2009). It is also important to stress that many of them manifested they had nowhere else to go should an eruption occur. Clearly, the mutualism influences the decision making, because people value not only the material, but also the spiritual benefits of their relationship with the volcano.

4.1. Temporal character of depictions

Although some modern depictions of Colombian volcanoes are long-lasting (the oldest example being the coat of arms of the city of Popayán, adopted in 1558) (Sánchez and Calvache, 2018), many are short-lived (*e.g.*, murals) because they can be replaced by a new design or erased/covered entirely. Older depictions (*e.g.*, pictographs, petroglyphs), on the other hand, show a long-lasting character in spite of being exposed to the elements for prolonged periods of time. It thus appears that pigments, and especially, etchings on rocks, were messages meant to last. In this regard, the symbolic efforts to get a durable message appear as a commemorative practice for identity and cultural reproduction through time. As noted by Jones (2007), in several societies, rocks and landscapes are related with the notion of permanence and serve as natural media for memory, history linkage and social stability.

4.2. Alternatives to figurative depictions of volcanic activity-joining the old and the new

In the cosmogonic beliefs of the Pastos ethnic group, origin-related tales such as the myth of the Two Partridges (Supplementary material 3) include allusions to a period of cataclysms that reorganized the world (Mamián *et al.*, 1996; Tarapués, 2013). This example underscores the relationships among myths, rock art and volcanic phenomena, given that primitive art representations are often the staging of mythical

accounts (*e.g.*, Leroi-Gourhan, 1971; Velandia, 1994). Due to the rich eruptive history in the Galeras Volcanic Complex (Calvache *et al.*, 1997; Cepeda, 2020), and to the idea that representing cataclysms (volcanic eruptions included) may have been the intention of some motifs in rock art sites (Cabrera, 1946), we turn our attention to abstract motifs in pictographs and petroglyphs that could conceivably convey the volcanic concept. By analyzing the real volcanic landscape or the modern depictions associated with it (Supplementary material 1), one realizes that in the past, the concept of volcanism could also have been represented by simple figures such as the triangle (or by triangles opposed by their apexes), or by more complex designs or combinations of motifs (Fig. 4). A number of the rock art sites described in the literature and three of those that could be inspected in the field (Supplementary materials 2 and 4), included designs that we suggest are “volcanic” in some respects; these are: triangles, triangles opposed by their apexes, converging triangles, nested triangles, complex figures, zigzag patterns, and arched lines enclosing other motifs (Fig. 4).

The sketches drawn from the pictographs and petroglyphs vary among authors, but very often it is possible to identify motifs that convey the idea of volcanism, even when the figures differ. For example, in the case of the Piedra de Guagua Rayo petroglyph (Genoy locality, Pasto) (Supplementary materials 2 and 4), we identified just to the left of the anthropomorphic figure a triangle with two of its sides projected upwards (Fig. 5). Cárdenas (1988) drew, for the same area, a mixed motif that looks very volcanic: a triangle with two sides that are projected upwards to form a complex figure. This overall consistency with our independent observations supports the suggestion of volcanic depictions being present in the rock art of Nariño.

When dealing with rock art, interpretations on the meaning of the motifs are highly hypothetical, *i.e.*, there is not a unique explanation. Our somewhat arbitrary ideas of simple forms, such as the triangle, as representative of volcanoes could also be replaced by the notion that the triangle is a recurrent figure because it is basic, so it can be used to construct more complex designs. According to López (2014), the triangle denotes integration, complementarity, and origin.

Despite the aforementioned ideas, the example presented in figure 5 strongly suggests a relationship

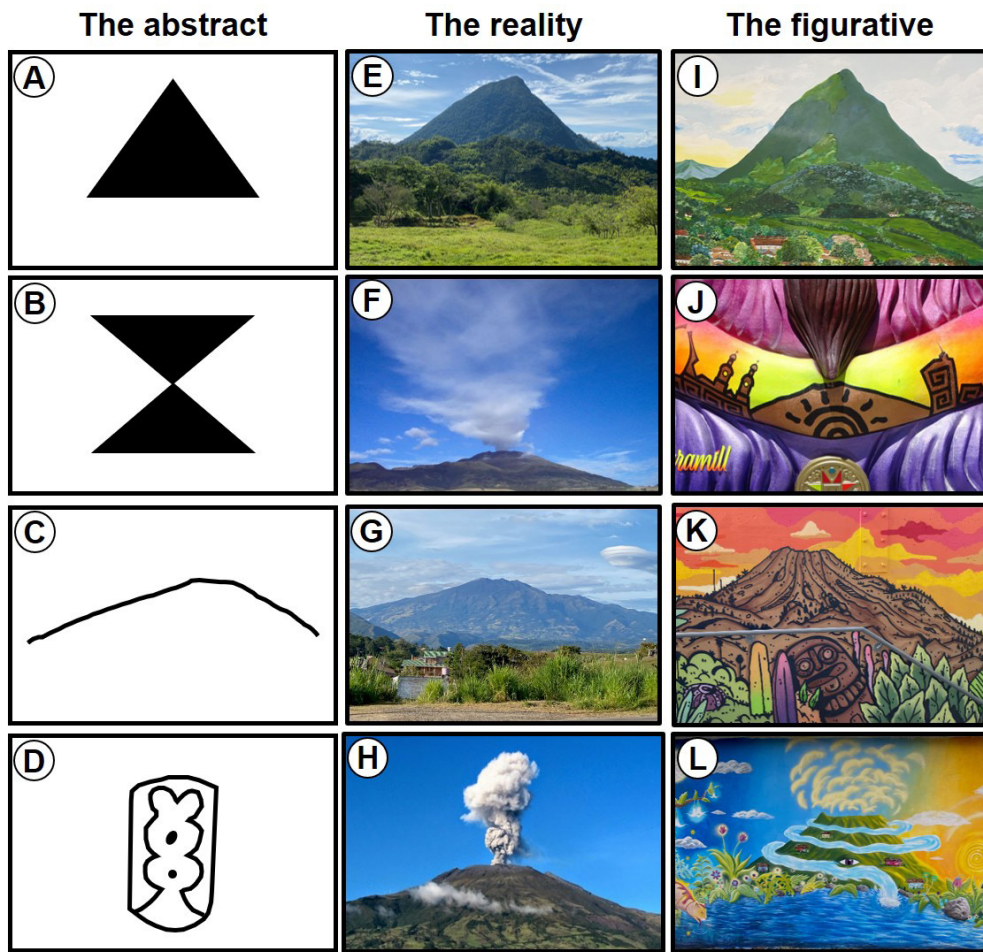


FIG. 4. Volcanic depictions, modern and old. **Left column:** Examples of motifs found in rock art sites (see Supplementary materials 2 and 4) that could be interpreted as volcanic allusions. **A.** Triangle. **B.** Two triangles joined by their apexes. **C.** Arched line. **D.** A complex design. **Center column:** Photographs of volcanoes whose outlines can be depicted using the motifs A-D. **E.** Cerro Tusa volcano, credit: John J. Sánchez. **F.** Galeras volcano in January 2009 with a persistent gas column, credit: Alix A. Linares. **G.** Galeras volcano in December 2021 as seen from the Chachagüí airport, credit: John J. Sánchez. **H.** Galeras volcano in eruption, credit: Colombian Geological Survey). **Right column:** Examples of modern depictions that are reminiscent of the reality shown in the center column and are somewhat similar to the rock art motifs in the left column. **I.** Mural with Cerro Tusa. **J.** Galeras volcano in a float made for the *Negros and Blancos* Carnival. **K.** Mural with Galeras volcano. **L.** Mural with Galeras volcano in activity (see Supplementary material 1 for additional details).

with volcanism that goes beyond any speculation derived from our ethnocentric view. Although the Quechuan toponymy of Urcunina, one of the most recent volcanoes of the Galeras Volcanic Complex and the older indigenous name given to the younger Galeras Volcano, translates as “mountain of fire” or “mountain that spews fire”; in the indigenous thinking of the region the volcano does not exist as a fire, earthquake, and ash-producing phenomenon,

but as high place inhabited by spirits where earth and water are periodically produced. In this way, the representation of water, or the high place, or that of a magical being is also a depiction of the volcanic phenomenon, which could also be represented by anthropomorphic figures like the ones included in the El Higuierón pictograph, Piedra de Guagua Rayo petroglyph or the Mantel de Piedra petroglyph. Another consideration is that most of the motifs are abstract,

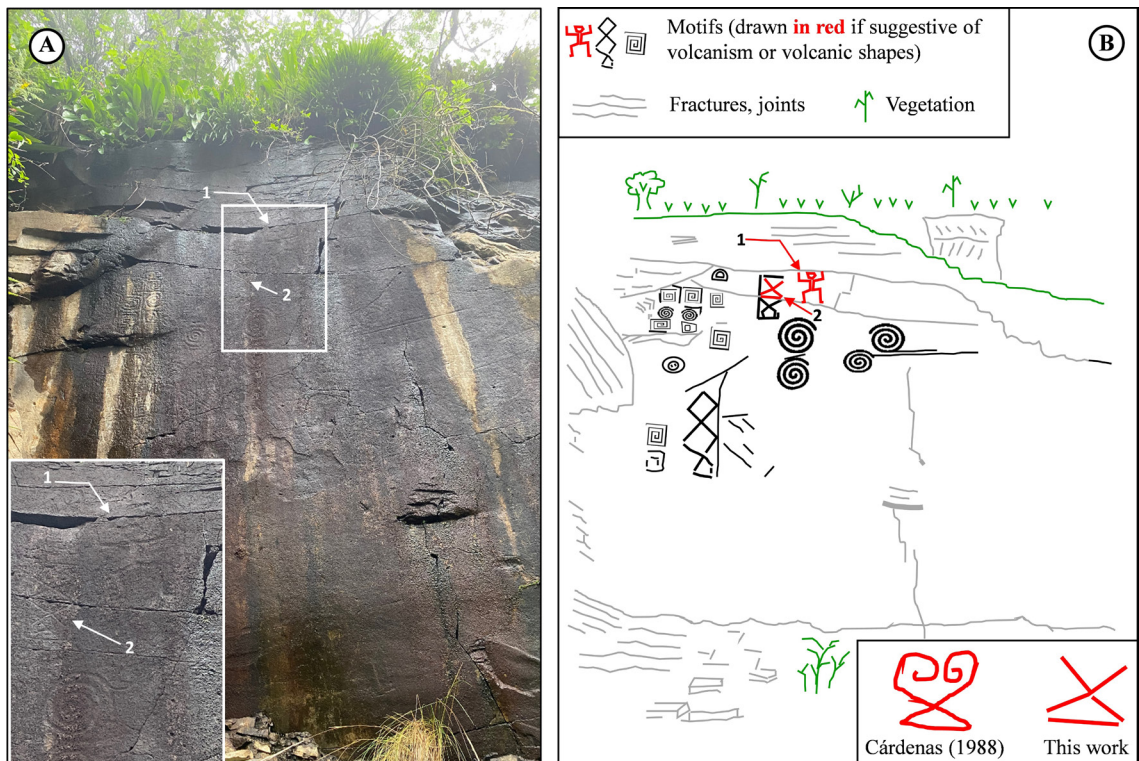


FIG. 5. The *Piedra de Guagua Rayo* petroglyph, also known as the *Vuelta Larga* petroglyph (Genoy locality, Pasto). **A.** Photo of the site, numbered arrows point to motifs mentioned in the text (1: Anthropomorphic figure representing the *Guagua Rayo*; 2: A triangle with two of its sides projecting upwards, a motif that is reminiscent of volcano shape). The rock face is roughly 8 m tall. **B.** A field sketch of the distinguishable motifs. The inset at the lower right shows, for comparison, enhanced versions of the sketch by Cárdenas (1988) and the one marked by number 2 in panel A (this work).

at least those in the rock art sites closer to volcanoes. Although there is great difficulty in recognizing on rock art the clear manifestation of volcanoes or volcanic activity, surely volcanoes represent a sacred entity because of their relationship to the origin myths, to the presence of pre-Columbian burial places around volcanoes, and to evidence of cosmic (spirals, stars, the sun), humanoid and exotic (monkeys) designs on near-volcano rock art representations.

The myths and legends also convey the idea of volcanism, though in a more complex way, coded within the stories, the words, and expressions that only locals understand, and the metaphorical allusions to the Earth, the mountains, and possible eruptive activity (see Supplementary material 3 for the list compiled in this study). For example, in the Mapachico locality (Pasto), locals know about the tale of *Juan Rayo* or *Guagua Rayo* (The Lightning Boy),

a boy-like character that was born during a lightning, who upon transforming into the Galeras (Urcunina) volcano is seen as the patriarch and origin of all the inhabitants of the region (Cepeda, 2020). This character indeed occupies a central place in rock art sites like the *Mantel de Piedra* (Altar Cloth Stone) and *Piedra de Guagua Rayo* (Lightning Boy Stone) petroglyphs (Fig. 5, Supplementary materials 2 and 4). Likewise, oral tradition and written stories persistently mention *El Taita Galeras* or *Urcunina* (Galeras the Elder), a very powerful and temperamental, yet benign entity, that must be respected or else face the consequences of his anger. There is also a balancing female character that has taken root among the inhabitants of the communities around Galeras volcano: *La Virgen del Rosario* (The Virgin of the Rosary), presumably the only one able to calm down the volcano when it is erupting.

4.3. The *El Higuierón* pictograph

Among the rock art sites reported in Supplementary material 2, two pictographs are well known in the literature: The *Piedra de los Monos* (Potosí, southern Nariño, near the Ecuadorian border) and *El Higuierón* (northeastern Nariño, near Genoy locality, Pasto), the latter being of special interest to our study because, according to literature, it included a figurative depiction of Galeras volcano in activity (Rodríguez, 1992; Quijano, 2009). Quijano (2009) referred, among many other symbols, to “a mountain-shaped figure with three wavy lines, like a smoking volcano”. Graphic information about this peculiar feature varied among sources (they were all hand-made drawings) and only two low-resolution photographs were available in unpublished sources. Analysis of these images revealed, firstly, that it was unclear whether the symbol was actually a volcano in activity; and second, that “the mountain” outline was actually the upper limit of a fracture with an arched form. Direct visual inspection of the *El Higuierón* was not possible because the pictograph was not there, at least not in its entirety (see Supplementary material 2). Its disappearance could have been caused by the *Higuierón* tree roots (*Ficus* sp.) and mosses which partially covered the rock where the paintings were located, simultaneously destroying some parts of the rock by mechanical fracturing.

Fortunately, our guide and hostess in the Mapachico locality (Indigenous Governor Sonia Gómez) was the sister of Diógenes A. Gómez. Mr. Gómez is a local artist who knew the site where the *El Higuierón* pictograph was, dedicating part his Master’s thesis to the analysis of it (Gómez, 2017). He agreed to meet with us, and through his direct impressions on this pictograph we could independently confirm that there was a motif suggestive of Galeras volcano with wavy lines on its top. He also agreed to produce a canvas painting with his memories of the pictograph (Fig. 6).

4.4. What is the likely age of pictographs like *El Higuierón* or *Piedra de Los Monos*?

If indeed the motif in *El Higuierón* pictograph represented the volcano with some activity, the timing of these rock art examples is relevant as well. The pictographs are located within the territories previously occupied by the Quillacingas (*El Higuierón*

and the Pastos (*Piedra de Los Monos*), descendants of the *Protopastos* people whose chronology has been situated between ~1,000 and 1,500 CE (Uribe and Cabrera, 1988; Tapia, 2006). Archaeological research in the Carchi Province (northern Ecuador) (Uhle, 1933; Grijalva, 1937; Jijón y Caamaño; 1951)² established three ceramic-style groups: Capulí, Piartal, and Tuza (Francisco, 1969). In Colombia, more recent works kept the same ceramic-based names for the archaeological groups (Cardale, 1978; Plazas, 1978; Uribe, 1978; Uribe and Lleras, 1983; Groot and Hooykaas, 1991). The chronologies for these archaeological groups have been revised with ¹⁴C dating of various materials found associated to ceramics (Uribe, 1992; Cárdenas, 2020). A summary is presented in table 2.

Given the location of the *El Higuierón* (northeast flank of Galeras volcano) and *Los Monos* pictographs (near Potosí in southern Nariño) (Fig. 1, Supplementary material 2), and considering the spatial and temporal contexts proposed for the Piartal and Tuza groups (Groot and Hooykaas, 1991), one could think that *El Higuierón* Pictograph may date back to the VI century, whereas the *Piedra de Los Monos* pictograph may be more recent, perhaps even belonging to the XVI century. There are two caveats regarding the previously presented idea. First, there is a significant difference in the iconographies of what is assumed as Pasto and Quillacinga (Piartal-Tuza); second, the *El Higuierón* pictograph may represent a society of hunters and gatherers (because of the documented anthropomorphic figure with a spear; see figure 6, a cultural economy that does not match either the Pastos or the Quillacingas, according to the archaeological studies and the chronicles of the Spanish conquerors (References). Considering the techniques (several colors, that could indicate differences in ethnic groups) and the figure that represents a hunter holding a spear (Figs. 2 and 6), it seems clear that the *El Higuierón* pictograph may belong to a different epoch, probably older than *Piedra de Los Monos*. Taking this into account, the *El Higuierón* pictograph may be pre-ceramic.

These very crude ideas on the chronology of the *El Higuierón* pictograph could gain some acceptance if we consider the late geologic evolution of the Galeras Volcanic Complex. Based on volcano-stratigraphy and ¹⁴C dating, Calvache (1995) and Calvache *et al.* (1997) found that Urcunina Volcano -the last eruptive stage before young Galeras Volcano- endured a

² Jijón y Caamaño, J. 1951. La cultura de la alfarería negativa del Carchi y de los sepulcros de pozo de Imbabura, Antropología prehispánica del Ecuador. La Prensa Católica: 412 p. Quito.



FIG. 6. Canvas painting by Diógenes A. Gómez showing Galeras volcano in activity (background) and a fragment of the dihedral rock where *El Higuerón* pictograph was made (foreground, white rectangle). On the left side of the rock, the motif representing the volcano is the arched black feature with zigzag or wavy yellow and red lines on top (white circle). Both the volcanic motif, as well as the anthropomorphic figure beneath it, have been enclosed in a white circle for clarity. A similar anthropomorphic figure appears in the forehead of the indigenous character that is painting the pictograph. The pictograph was drawn on two nearly perpendicular rock faces and contained several other motifs. Mr. Gómez is considered a reliable direct witness of the existence of the pictograph, which was originally reported in Cabrera (1966), Granda (1983), and Quijano (2009).

catastrophic summit collapse of its western flank, sometime between ~12.8 and 5 ka BP, that generated a large debris avalanche deposit in the Azufral River valley; this age range fits the possible timing of early occupations in this part of South America (Mayer-Oakes, 1996; Gnecco, 2000; Nami and Stanford, 2016). During the last ~4,500 years, abundant activity of Galeras Volcano has been documented, including important eruptions that took place around the IX century (~1.1 ka BP) with surges, pyroclastic flows, lahars, and lava flows mainly emplaced towards the eastern and northeastern flanks of the volcano (Calvache, 1990), including the areas of the current Genoy and Mapachico localities. It is thus plausible that the aforementioned events or similar eruptions that took place between the collapse of Urcunina (12.8-5 ka BP) and 1.1 ka BP could have inspired the ancestral artist that painted the volcano.

4.5. Integrating the old and the new depictions to understand communities-volcanoes mutualism

We have documented a number of modern occurrences of volcanic depictions in Colombia (Supplementary material 1) and focused on the State of Nariño to seek older forms of figurative and non-figurative representations (Supplementary materials 2, 3, and 4). The data compiled and analyzed in this study reveals a variety of purposes, and stylistic and spatial-temporal characteristics deemed here as relevant to the understanding of the relationship between volcanoes and the communities.

For modern depictions we see a dominance of the figurative or naturalistic ones and only a few cases of abstract forms of volcanoes. Many of the depictions are related to art and decoration (these two uses are quite related, as many decorative murals

TABLE 2. NAMES AND CHRONOLOGIES FOR CERAMIC COMPLEXES AND ETHNIC GROUPS IN THE NARIÑO REGION.

Uribe (1992)			Cárdenas (2020)		
Phase-Period	Century	¹⁴ C Dates (CE)	Phase-Period	Century	¹⁴ C Dates (CE)
Piartal	VIII-XIII	745-1,250	Piartal	VI-XVI	1,130
Capulí	XII-XV	1,100-1,460	-	-	-
Tuza	XV	1,410	Tuza	XIV-XVI	-
Quillacinga	XVII-XVIII	1,615-1,720	-	-	-

can be seen as art). Active polygenetic volcanoes are represented most of the time, but a few inactive monogenetic volcanoes have been adopted as icons or symbols for small municipalities, *e.g.*, Colimba dome for the Guachucal municipality (Nariño) and Cerro Tusa and Cerro El Sillón for the Venecia municipality (Antioquia). The temporal character among the depictions vary, with some being included in the coats of arms or flags of municipalities-which means they are part of the heritage of those cities- and will be preserved and remain seen for a long time; whereas others are more ephemeral and will last for a shorter period of time, perhaps decades, because they are subjected to weathering or are images used for commercial purposes. In any case, it appears that people depict volcanoes, near and far, to convey their own perception of the volcanic form or of the volcanic phenomena; in doing this, they show that volcanoes are relevant to them, and, most importantly, manifest their sense of belonging to their territory.

For older depictions, our findings reveal that rock art sites in the State of Nariño include motifs that are reminiscent of volcanism located at average distances from volcanoes (~17 km) that are similar to those determined for modern depictions (~19 km), thus integrating old and modern cases, depictions are expected to be found within ~18 km of a volcano.

Regarding the time character of depictions, rock art lasts longer (several millennia?) as opposed to the relatively short life span of modern representations. Older depictions focused on the abstract and the symbolic, and it is difficult to assess their purpose or their use, as opposed to the modern cases. By analyzing the outlines of modern depictions (Fig. 4; Supplementary material 1), however, we find some possible linking traits to the older cases, namely the use of simple shapes like triangles, broken or

zigzag lines, arched lines (see, for example, Cruz and Yaqueno, 2023), that in the past may have also been intended to depict volcanism. That simple motifs like triangles or arched lines were used by the ancestral inhabitants as symbolic depictions of volcanoes makes sense if we consider the conditions under which they were produced: primitive tools, slippery and steep rocky surfaces, and basic materials; conditions that required simplicity in the etchings and drawings. Geometric shapes represent better the connectivity and balance that persist in the indigenous thinking (López, 2014). Whether the designs left on rocks were intended to represent volcanism remains as an open question, because visual design is characterized by its intentionality, but it may be oriented towards the aesthetic, the semantics, or other ends (Leroi-Gourhan, 1971). Also, the identification of the link between a pictograph or petroglyph maker and the reality they lived in is a complex process because the relationship among aesthetics, design, and the environment or the society is multidimensional (Duncan, 1992).

Oral tradition demonstrates that volcanoes are important not only because of the natural resources they offer, but also because of the supernatural connotation they have, which gives them some kind of “conscience”. In the folk tales documented here there exist reiterative mention to magic beings and spirits related to volcanoes (Supplementary material 3). This means that volcanoes are deeply rooted in the symbolic and spiritual systems of people as some kind of volcanic animism or totemic thinking (that is, volcanoes not only are to be protected but also respected and venerated). These kinds of ingrained spiritual links between a community and the land have been named “telluric thinking” (Vasco, 2002). In the case of Genoy, its inhabitants recognize

Juan Rayo (Lighting Boy) in the *Piedra de Guagua Rayo* petroglyph (Fig. 5; Supplementary materials 2 and 4) as well as in the *Mantel de Piedra* petroglyph, establishing a direct link between their ancestral origin, Galeras volcano, and their territory (Perugache, 2017). Folk tales also persistently allude to the lightning, the thunder, the fire, even to the boiling stones. All of these imply that, when provoked, the sacred raging volcanoes are capable of terrible things, a concept well known to other “volcanic” cultures as well (Broda, 2009). In case of eruption, intervention from a very powerful equal would be needed to soothe them (the water, the Virgin of the Rosary). Thus, for people like the inhabitants of the Mapachico locality, mountain visitors are welcomed so long as they ask for permission before trekking or climbing, remain silent, and do not affect the environment in any way. Such beliefs so deeply rooted among the indigenous inhabitants play a critical role during times of volcanic unrest (e.g., earthquakes, increased gas emissions, ground deformation, ash emissions, explosions), because they firmly rely on the fact that as they have lived there for generations nothing bad will happen to them; because that although the *Guagua Rayo* may be furious, the Virgin of the Rosary is on their side.

4.6. Limitations of the interpretations and questions for further research

In this study we provided data on the spatial and temporal nature of volcanic depictions in Colombia with an emphasis on the State of Nariño, and put forward some ideas to guide future research on both modern and old representations. Naturally, our research faced some limitations related to site accessibility, the preservation (or lack thereof) of rock art sites, impossibility to document all occurrences of depictions in such a large area, and particularly the absence of geochronological data to constrain the age of the pictographs. These shortcomings, however, can guide future research through questions like: Why were older representations mostly symbolic? Did simple symbols like triangles and arched lines really represent volcanoes? What was their purpose? Why were they done in such inaccessible places? Do modern depictions maintain some traits inherited from older depictions? What does art in other types

of ancestral and modern objects (ceramics, textiles, filigree, and gold/silver smithing) tell us about volcanic depictions? Additional data and research will take us nearer to some of the answers and in this way closer to furthering our understanding of the relationship between people and their volcanoes.

5. Conclusions

Modern depictions of volcanism are mainly located within ~20 km of their respective volcanic centers (with some outliers found at distances of several hundred kilometers away). Their uses are varied but artistic representations dominate, tending to be short-lived although some may last for decades or centuries. In Nariño, rock art sites also locate within similar distances from the nearest volcanoes; they are long-lasting despite the harsh conditions they have endured. The intended purposes of pictographs and petroglyphs remain a mystery and are subject to different interpretations. In this study we develop the idea that rock art may contain abstract motifs that depict volcanism, and that the same such motifs are contained in the outlines of modern depictions. Depictions of volcanism embody the sense of belonging and are an important part of the communities-volcanoes mutualistic relationship. Myths and legends do contain allusions to volcanism either in symbolic or direct ways. Although these reveal that inhabitants of volcanic regions acknowledge the temperamental character of volcanoes, they prefer to see volcanoes as benign. These findings modulate, to great extent, the perception of volcanic hazard, not only in modernity but also to pre-Hispanic times as ancestors also lived in proximity to volcanoes.

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Supplementary material 1

Photographic evidence of volcanic depictions (129) observed between 2018 and 2023 in Colombia. For depictions during the period 1558-2017, see Sánchez and Calvache (2018) and Calvache and Sánchez (2022). Depictions are shown and described according to the volcanic center or complex, from south to north. CCNVC: Chiles-Cerro Negro Volcanic Complex; CVC: Cumbal Volcanic Complex; AVC: Azufral Volcanic Complex; GVC: Galeras Volcanic Complex; SIDC: Santa Isabel Dome Complex; CMNVC: El Cisne-Morro Negro Volcanic Complex; NRVC: Nevado del Ruiz Volcanic Complex; CBVC: Cerro Bravo Volcanic Complex. The last column named “simple shape” refers to what simple form could best approximate the outline of the volcano or volcanic complex: T: triangle; BL: broken or zigzag line; AL: arched line; U: undefined. The last six depictions are textual and do not have a simple shape associated.

TABLE S1

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
1		Drawing on paper	Government	Indigenous Council of Chiles rural settlement	Depicts Chiles volcano. Author: Ismael Ipial	T
2		Paint on metal	Religion	Chiles village	Welcoming sign, Chiles volcano shown in background	T
3		Print on vinyl	Government	Chiles village	Emblem for Chiles Indigenous Reservation, shows Chiles and Cerro Negro de Mayasquer, volcanoes of CCNVC	BL
4		Paint on canvas	Art	Medellín	Shows north flank of Chiles volcano with collapse scar, JJS private collection. Author: Marlon R. David	AL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
5		Paint on concrete	Education	Chiles village	Advertising of foundation for helping people with cognitive impairment, emblem at center shows two snowy mountains: Chiles volcano and CVC, snowy peak at left may represent Chiles volcano	BL
6		Print on vinyl	Commerce	Cumbal lake	Restaurant advertisement, shows photo of CVC on background	BL
7		Paint on concrete	Commerce	Cumbal	Advertisement for hardware store, shows CVC. Author: Kaupos. AV	BL
8		Acrylic design	Commerce	Cumbal	Advertisement for grocery store, with a silhouette of CVC	BL
9		Print on vinyl	Commerce	Cumbal	Restaurant advertisement, shows photo of CVC on background	BL
10		Print on vinyl	Commerce	Cumbal	Advertisement for garden center, shows photo of CVC on background	BL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
11		Airbrush paint on glass	Hotel industry	Cumbal	Abstract depiction of CVC and mention of widely known alternative name for Cumbal volcano	BL
12		Watercolor on paper	Art	Medellín	Artwork that depicts CVC. Title: <i>Volcán Nevado de Cumbal (Pasto)</i> - "Snow-capped Cumbal volcano (Pasto)". Author: Pedro N. Gómez	BL
13		Paint on concrete	Heraldry	Machines (Tasmag) rural settlement	Coat of arms for Machines farm school, mountains include CVC	BL
14		Paint on concrete	Decoration	Cumbal	Mural adorning interior of restaurant, shows La Plazuela volcano (one of the two active centers of CVC) in activity	BL
15		Print on vinyl	Health	Cumbal	Banner near the entrance of main Hospital, includes an outline of CVC	BL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
16		Paint on concrete	Transportation	Cumbal	Emblem of truckers' labor union, shows CVC with La Plazuela volcano in activity	BL
17		Paint on concrete	Decoration	Cumbal	Composite of two fragments (mural was painted on a corner), shows mountains that include CVC and possibly CCNVC	BL
18		Paint on concrete	Decoration	Cumbal	Shows CVC on background	BL
19		Paint on concrete	Decoration	Cumbal	Shows two snowy mountains at right that represent CVC and two green peaks at left, possibly the CCNVC. Authors: Janneth T.; Karen E.; Andrés O.; Sandra, C.; Karol P. (possibly students from Universidad de Caldas)	BL
20		Print on vinyl	Decoration	Cumbal	This is a print of an original artwork (canvas painting?). Author: Buesaquillo	BL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
21		Paint on ceramic	Religion	Las Lajas sanctuary (Potosí)	Ceramic tiles mosaic near the entrance to the church, shows CVC on background. Author: Jolurefi S.	BL
22		Paint on concrete	Decoration	Cumbal	Shows CVC with La Plazuela volcano in activity. Author: Óscar T.	BL
23		Print on synthetic fiber	Religion	Cumbal	Print adorning rear window of bus. The photo shows CVC	BL
24		Paint on concrete	Education	Guachucal	Mural adorning entrance of farm school, mountains include Colimba dome, a landmark of the region	T
25		Print on metal	Religion	Guachucal	On the main road between Túquerres and Guachucal, near detour to Colimba village, the photo shows Colimba dome	T
26		Paint on concrete	Decoration	El Espino village	Mural adorning exterior wall of a house, shows Laguna Verde crater lake of AVC	U

table S1 continued.

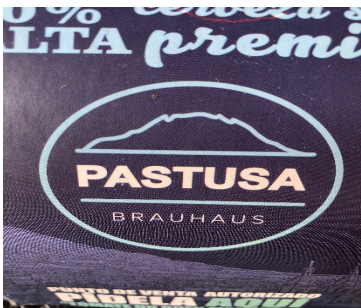
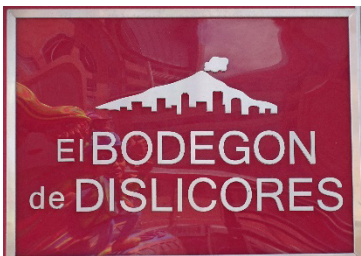
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
27		Paint on concrete	Decoration	El Espino village	Mural adorning exterior wall of a dairy products establishment, shows Laguna Verde crater lake of AVC, and one unspecified volcano in activity	T
28		Paint on canvas	Art	Medellín	Although the mountain shown is known as “Galeras” volcano in the region, it actually corresponds to Urcunina volcano (a Holocene volcano that predates Galeras, the relatively young active cone of the GVC), viewed from Cabrera village, roughly 15 km east of the volcano. Artwork in JJS private collection. Author: Marlon R. David	AL
29		Print on vinyl	Commerce	El Pedregal	Advertisement for bottled water, shows Galeras volcano in activity	AL
30		Print on vinyl	Commerce	Pasto	Advertisement for beverage, shows outline of GVC	AL
31		Acrylic design	Commerce	Pasto	Advertisement for local business, shows GVC with Galeras volcano in activity	T

table S1 continued.

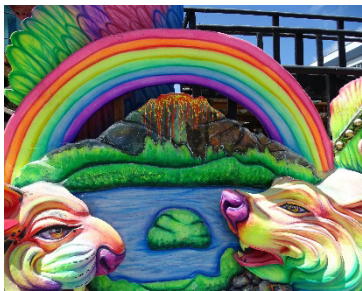
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
32		Airbrush paint on papier maché	Culture	Pasto	Motif adorning a float during the 2020 <i>Negros y Blancos</i> carnival, shows Galeras volcano with lava pouring from its flanks	T
33		Airbrush paint on papier maché	Culture	Pasto	Motif adorning a float during the 2020 <i>Negros y Blancos</i> carnival, shows Galeras volcano in activity	T
34		Wood structure with products	Culture	Genoy village	This structure is called <i>El Castillo</i> - "The Castle", a representation of Galeras volcano with agricultural products harvested from its flanks, built as a tribute from the indigenous people to the volcano for benefits received	T
35		Print on plastic	Commerce	Chachagüí	Label on bottled beverage, shows a conic mountain with crater in activity (Galeras), same image is used in letter "A" of product name	T

table S1 continued.

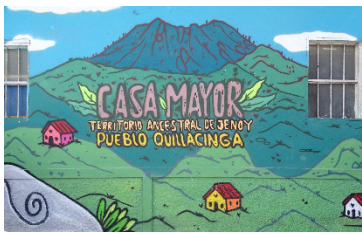
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
36		Paint on canvas	Art	Medellín	Shows part of GVC with Galeras volcano in activity, also, includes de artist's perception of the <i>El Higuérón</i> pictograph. Artwork in JJS private collection. Author: Diógenes A. Gómez	T
37		Print on vinyl	Heraldry	Genoy village	Coat of arms of the diocese of Pasto, shows a green conic mountain, Galeras volcano in activity	T
38		Paint on concrete	Decoration	Genoy village	Shows a mountain that has crops on its flanks. Urcunina volcano, part of GVC, is seen in background of photo partly covered by clouds	T
39		Paint on concrete	Decoration	Genoy village	Mural adorning exterior wall of indigenous authority house in Genoy, depicts Galeras volcano	T
40		Paint on canvas	Art	Pasto	Urcunina volcano, part of GVC, shown in background. Author: Rodríguez Mora	AL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
41		Paint on metal	Prevention	Galeras	Evacuation sign, shows outline of Galeras volcano	T
42		Print on plastic	Transportation	Chachagüí	Logo of bikers' club, shows a conic snowy mountain with crater (Galeras volcano)	T
43		Print on vinyl	Transportation	Pasto	Logo of transportation company that shows Galeras volcano in activity, as seen from Consacá, a town located roughly 12 km west of the volcano	T
44		Paint on concrete	Decoration	Chachagüí	Mural adorning exterior wall of airport, shows GVC as seen from north. Authors: @Colorama and @Suku	T
45		Paint on concrete	Decoration	Mapachico locality	Mural adorning exterior wall of farm school, shows female version of GVC with Galeras volcano in activity	T

table S1 continued.

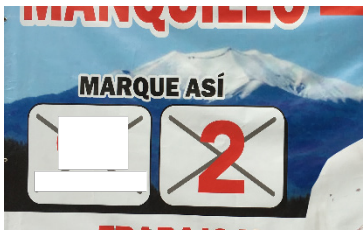
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
46		Paint on concrete	Decoration	Aguapamba rural settlement	Mural adorning wall on local aqueduct, shows GVC and Galeras volcano in activity. Author: Carol Durán	T
47		Print on vinyl	Government	Genoy village	Banner that shows a photo of GVC with Galeras volcano in activity	T
48		Paint on carved wood	Tourism	Puracé, La piedra del cóndor site	Welcoming sign at entrance to place of rituals dedicated to the cóndor of the Andes, shows Puracé volcano in activity and other volcanoes of Coconucos Volcanic Chain	BL
49		Print on vinyl	Politics	Puracé village	Banner for political campaign, shows snowy peak (Puracé volcano)	T
50		Print on vinyl	Politics	Puracé village	Banner for political campaign, shows photo of snow-capped Puracé volcano	AL
51		Embroidery	Government	Paletará village	Logo of indigenous authority in Paletará reservation, the snowy peaks likely depict Puracé and some other centers of Coconucos Volcanic Chain	BL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
52		Embroidery	Tourism	Paletará village	Logo of local touristic guidance business, snowy peaks likely depict Puracé and some other centers of Coconucos Volcanic Chain	BL
53		Paint on carved wood	Government	Entrance to Puracé National Park (Puracé)	Logo of Park authority, shows snow-capped Puracé volcano	T
54		Embroidery	Government	Puracé village	Logo of indigenous authority in Puracé reservation, shows snowy peak (Puracé volcano)	T
55		Paint on concrete	Decoration	Puracé village	Mural adorning street, snowy peak at center depicts Puracé volcano	AL
56		Paint on concrete	Decoration	Puracé village	Mural adorning street, mountains with faces on both sides represent spirits that, according to folk legends, inhabit Puracé volcano	T

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
57		Print on paper	Tourism	Villa Restrepo rural settlement	Trekking route sign, shows photo of Nevado del Tolima volcano	T
58		Paint on concrete	Decoration	Villa Restrepo rural settlement	Mural adorning street, shows Nevado del Tolima volcano at center	T
59		Print on vinyl	Prevention	Villa Restrepo rural settlement	Sign with information on regional organization for risk management, depicts snow-capped Nevado del Tolima volcano	T
60		Print on plastic	Tourism	Villa Restrepo rural settlement	Advertisement for local tourism guidance business, snowy peak represents Nevado del Tolima volcano	BL
61		Paint on concrete	Decoration	Villa Restrepo rural settlement	Mural adorning exterior wall of school, shows Nevado del Tolima volcano	T

table S1 continued.

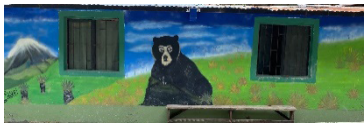
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
62		Paint on concrete	Decoration	Villa Restrepo rural settlement	Mural adorning exterior wall of house, shows Nevado del Tolima volcano at left	T
63		Paint on concrete	Decoration	Villa Restrepo rural settlement	Mural adorning exterior wall of lookout point, shows Nevado del Tolima volcano	T
64		Paint on canvas	Art	Ibagué	Canvas painting inside local business, shows Nevado del Tolima volcano on background. Author: J. Molano	T
65		Paint on canvas	Art	Ibagué	Canvas painting inside local business, shows snow-capped Nevado del Tolima volcano at background upper center. Author: Karla Hoyos	T
66		Watercolor on paper	Art	Medellín	Artwork that depicts two volcanoes: Nevado del Tolima and Santa Isabel (SIDC). Title: "Tolima y Santa Isabel". Author: Pedro N. Gómez	BL

table S1 continued.

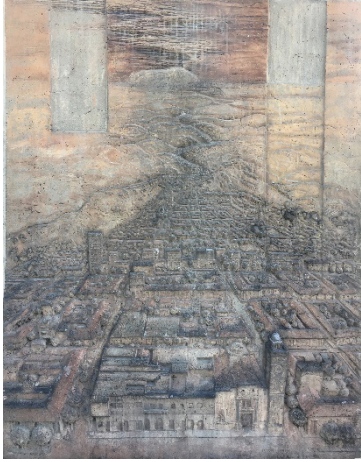
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
67		High relief on ceramic	Art	Armero-Guayabal	Located at the Armero memorial site, this is one of four tiles that depict Nevado del Ruiz (upper center in this frame) and the former town of Armero (foreground), destroyed during lahars on November 13 th , 1985	AL
68		Print on vinyl	Government	Herveo	Advertisement on side of public services garbage truck, photo shows Nevado del Ruiz volcano with gas column	AL
69		Paint on metal	Commerce	Manizales, La Esperanza site	Advertisement of local business, shows two volcanoes of NRVC: Nevado del Ruiz and La Olleta	BL
70		Print on vinyl	Government	Las Brisas site.	Information banner of National Park Authority, photo shows La Olleta volcano of NRVC	T
71		Print on synthetic material	Tourism	Manizales	Welcoming sign at local airport, photo shows two volcanoes of NRVC: Nevado del Ruiz and La Olleta	BL

table S1 continued.

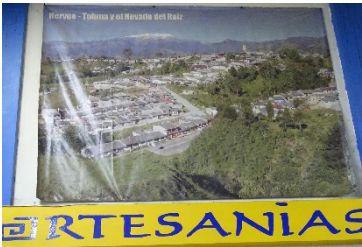
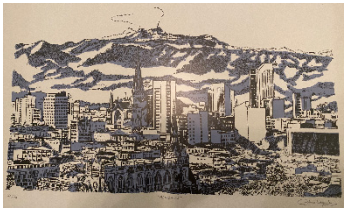
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
72		Print on vinyl	Tourism	Mesones rural settlement	Banner inside a local business, photo shows Nevado del Ruiz volcano in background	AL
73		Watercolor on hand-made paper	Art	Medellín	Nevado del Ruiz in eruption and La Olleta volcano, of NRVC. Artwork in JJS private collection. Author: Rubén Castaño	BL
74		Mixed technique on paper	Art	Manizales	A drawing of the city of Manizales with Nevado del Ruiz in activity and La Olleta volcano, of NRVC. Óscar I. Sepúlveda private collection. Author: Cucharitadepalo	BL
75		Paint on canvas	Art	Manizales	Diptych that includes Nevado del Ruiz on right panel. Author: J. Ortiz	T
76		Paint on concrete	Decoration	Manizales	Fragment of mural adorning a street, shows two volcanoes of NRVC: Nevado del Ruiz and La Olleta	BL

table S1 continued.

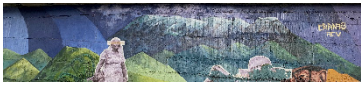
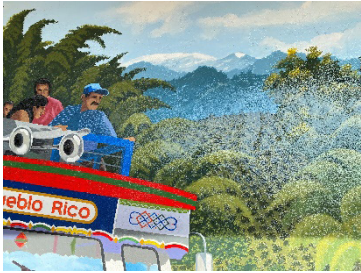
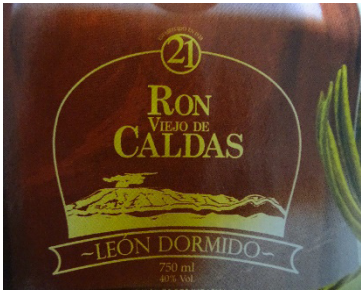
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
77		Paint on concrete	Decoration	Manizales	Fragment of mural adorning a street, shows two volcanoes of NRVC: Nevado del Ruiz and La Olleta. Author: CRANEO ACV	BL
78		Paint on concrete	Decoration	Manizales	Fragment of mural adorning a street, shows an outline of the city of Manizales with Nevado del Ruiz and La Olleta volcano, of NRVC, on background	BL
79		Paint on concrete	Decoration	Pueblo Rico rural settlement (Neira)	Fragment of mural adorning the interior wall of a restaurant, shows Nevado del Ruiz and La Olleta volcano, of NRVC, on background. Author: Gallo	BL
80		Print on yute fiber sack	Tourism	Manizales	Emblem of touristic campaign that includes a silhouette of Nevado del Ruiz and La Olleta volcano of NRVC	AL
81		Print on plastic	Commerce	Manizales	Label on bottled spirit, shows Nevado del Ruiz and La Olleta volcanoes of NRVC	BL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
82		Print on paper	Tourism	Las Brisas site	Welcoming sign that includes a photo of La Olleta volcano of NRVC	T
83		Paint on ceramic	Government	Manizales	Ceramic tiles mosaic that includes Nevado del Ruiz and La Olleta volcanoes of NRVC	BL
84		Paint on concrete	Decoration	Manizales	Mural adorning street, shows Nevado del Ruiz volcano of NRVC	T
85		Paint on concrete	Decoration	Manizales	Mural adorning street, shows Nevado del Ruiz and La Olleta volcanoes of NRVC	AL
86		Paint on concrete	Decoration	Armero Guayabal	Mural adorning the exterior wall of a house's ruins in Armero, the city destroyed during lahars on November 13 th , 1985, the image includes a triptych of Nevado del Ruiz volcano (NRVC) in activity	AL
87		Paint on concrete	Decoration	Manizales	Mural adorning the exterior wall of a building, shows Nevado del Ruiz volcano (NRVC) on background. Author: Marcelo	AL

table S1 continued.

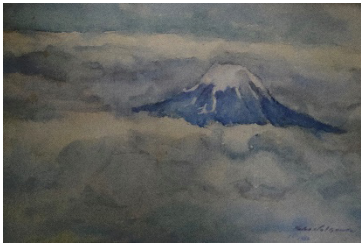
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
88		Paint on concrete	Decoration	Manizales	Mural adorning street, shows Nevado del Ruiz and La Olleta volcanoes of NRVC	BL
89		Paint on concrete	Decoration	Villamaría	Mural adorning street, shows Nevado del Ruiz and La Olleta volcanoes of NRVC. Author: Felipe Wylito	BL
90		Paint on concrete	Art	Medellín	Fragment of a mural adorning pedestrians' passageway, shows snow-capped Nevado del Ruiz volcano (NRVC). Title: <i>Historia del desarrollo industrial del Departamento de Antioquia</i> - "History of the industrial development of the State of Antioquia". Author: Pedro N. Gómez	T
91		Watercolor on paper	Art	Medellín	Artwork that depicts snow-capped Nevado del Ruiz volcano (NRVC). Title: "Nevado del Ruiz". Author: Pedro N. Gómez	T
92		Watercolor on paper	Art	Medellín	Artwork that depicts snow-capped Nevado del Ruiz volcano (NRVC). Title: "Nevado del Ruiz". Author: Pedro N. Gómez	BL

table S1 continued.

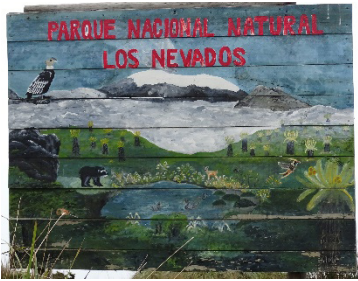
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
93		Paint on wood	Tourism	Laguna Negra site	Welcoming sign that shows Nevado del Ruiz in activity and La Olleta volcanoes (NRVC)	BL
94		Paint on metal	Tourism	Laguna Negra site	Welcoming sign that shows Nevado del Ruiz (in activity) and La Olleta volcanoes of NRVC	AL
95		Paint on canvas	Art	Pueblo Rico rural settlement (Neira)	Artwork that shows Nevado del Ruiz and La Olleta volcanoes (NRVC)	BL
96		Paint on metal	Government	Manizales	High-relief on wrought iron culvert's cover, shows La Olleta and part of Nevado del Ruiz. Title: <i>Montaña mágica</i> - "Magic Mountain". Author: Olga L. Hurtado	BL
97		Paint on metal	Government	Manizales	High-relief on wrought iron culvert's cover, snowy peak represents Nevado del Ruiz volcano. Title: <i>Raíces de mi pueblo</i> - "Roots of my town". Author: Valeria Martínez	T

table S1 continued.

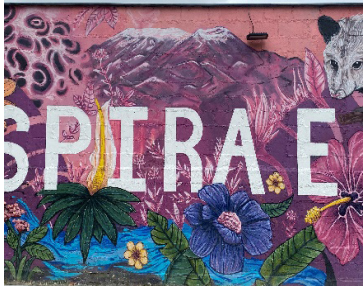
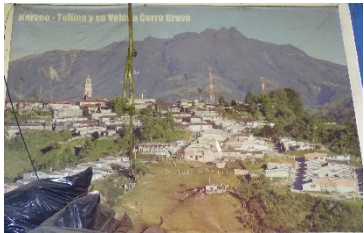
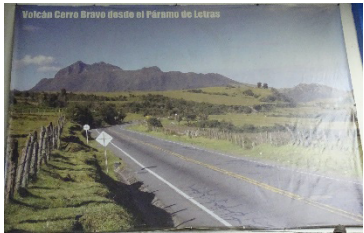
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
98		Paint on concrete	Decoration	Manizales	Fragment of a mural adorning a park. Shows Nevado del Ruiz and La Olleta volcanoes. Authors: CRANÉ·MRO	BL
99		Paint on concrete	Decoration	Manizales	Fragment of a mural adorning end of a cul-de-sac. Author: Unknown. Photo credit: Carlos A. Heredia	AL
100		Print on vinyl	Education	Papayal rural settlement (Villamaría)	Banner with information on rural school, shows photo of Nevado del Ruiz volcano (NRVC)	BL
101		Print on vinyl	Tourism	Mesones rural settlement (Herveo)	Banner inside a local business, photo shows Cerro Bravo volcano (CBVC) in background	BL
102		Paint on wood	Tourism	Mirador Cumaday site	Advertisement of local business, shows snowy peaks representing Nevado del Ruiz volcano (NRVC)	BL
103		Print on vinyl	Tourism	Mesones rural settlement (Herveo)	Banner inside a local business, photo shows Cerro Bravo volcano (CBVC) in background	BL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
104		Coat of arms	Heraldry	Venecia	Heraldic shield of Venecia municipality, includes Cerro Tusa, a Neogene volcano, at center	T
105		Flag	Vexilology	Venecia	The flag of Venecia municipality also includes the heraldic shield with Cerro Tusa, a Neogene volcano, at center	T
106		Paint on concrete	Commerce	Medellín	Advertisement of coffee products, depicts Cerro Tusa (right) and El Sillón (center)	T
107		Paint on metal	Tourism	Venecia	Advertisement for local hotel and thermal springs, depicts Neogene volcano Cerro Tusa	T
108		Paint on metal	Tourism	Venecia	Advertisement for local hotel and thermal springs, depicts Neogene volcano Cerro Tusa with rivers similar to glowing-red lava that descend from its flanks	T

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
109		Paint on metal	Decoration	Venecia	Painting adorning side panel of food truck, shows Neogene volcano Cerro Tusa	T
110		Watercolor on paper	Art	Medellín	Artwork that shows mountains of the Cordillera Central in southwestern Antioquia, including Neogene volcano Cerro Tusa to the left with its distinctive pyramid-like outline	T
111		Paint on concrete	Decoration	Venecia	Mural adorning pedestrians' passageway, shows the silhouette of Neogene volcano Cerro Tusa	T
112		Paint on concrete	Decoration	Venecia	Mural adorning interior wall of public services office, shows Neogene volcano Cerro Tusa	T

table S1 continued.

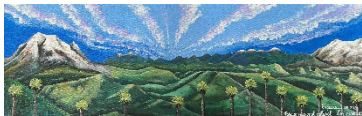
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
113		Wood carving	Art	Venecia	Fragment of wood carving that includes a depiction of Neogene Volcano Cerro Tusa, placed as part of the native's headdress	T
114		Print on plastic	Commerce	Bogotá	Advertisement of coffee products, depicts in white an unspecified volcano in activity	T
115		Paint on wood	Government	Las Brisas site	Welcoming sign at entrance to Los Nevados National Park, shows snowy peak likely representing either Nevado del Tolima or Nevado del Ruiz volcano	T
116		Paint on canvas	Art	Medellín	Artwork that depicts (from left to right): Nevado del Tolima, Paramillo del Quindío, Nevado Santa Isabel, Paramillo del Cisne (CMNVC), and Nevado del Ruiz. Artwork in JJS private collection. Author: Óscar F. Esguerra	BL

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
117		Drawing on paper	Ecology	Manizales	Depicts a snowy mountain likely representing one of the volcanoes of Cordillera Central	T
118		Paint on concrete	Decoration	Manizales	Fragment of mural adorning street, shows an unspecified volcano in eruption	AL
119		Paint on concrete	Art	Medellín	Mural adorning interior wall of auditorium in <i>Facultad de Minas</i> (School of Mines) at <i>Universidad Nacional de Colombia</i> , (Medellín campus). Title: <i>Explosión de la montaña</i> - "Explosion of the Mountain" and, according to the author, represents the telluric (Earthly) forces in anthropomorphic expression, mountains of Colombia and Antioquia unconquered. Author: Pedro N. Gómez	U
120		Mixed technique on paper	Art	Medellín	Fragment 1 of artwork exhibited at Medellín's Museum of Modern Art, shows an unspecified volcano erupting explosively. Title: <i>Proceso 8000</i> - "Process 8000". Author: Jorge J. Aristizábal	T

table S1 continued.

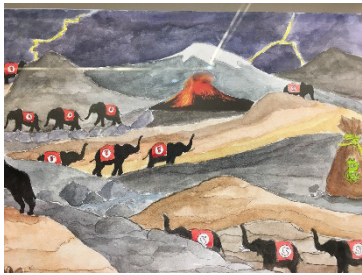
N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
121		Mixed technique on paper	Art	Medellín	Fragment 2 of artwork exhibited at Medellín's Museum of Modern Art, shows an unspecified volcano erupting effusively volcano. Title: <i>Proceso 8000</i> - "Process 8000". Author: Jorge J. Aristizábal	T
122		Acrylic design	Commerce	Manizales	Advertisement of local business, shows a silhouette of Vesuvius volcano (Italy) in activity, an example of an atypical representation for the region	BL
123		Tattoo	Body art	Manizales	A participant of international course in field volcanology sports on his leg a tattoo of an unspecified erupting volcano	T
124		Print on synthetic material	Hotel industry	Pasto	Advertisement for local hotel, although not a figurative depiction, the name of the business includes explicit mention of volcano name	-
125		Paint on carved wood	Ecology	Toche rural settlement	Wooden plank with information on hydric resources conservation, although not a figurative depiction, there is explicit mention of a volcano name	-

table S1 continued.

N	Graphic depiction	Type of depiction	Context	Place	Additional information	Simple shape
126		LED display	Prevention	Manizales	Luminous screen with message on the current alert level for volcano	-
127		Print on vinyl	Transportation	Herveo	Emblem of transportation cooperative, the name of the business includes explicit mention of volcano name	-
128		Print on paper	Religion	Herveo	Invitation to a pilgrimage, although not a figurative depiction, the poster mentions explicitly the name of a volcano	-
129		Print on cardboard	Commerce	Medellín	Commercial label of product, although not a figurative depiction, the label implies explicit mention of the volcanic concept	-

Supplementary material 2

Base information for rock art sites (both reported in the literature and those visually inspected during field campaigns).

TABLE S2

Semiotics and visual narrative										Spatial aspects				Bibliography	Observations
No.	Site name	Type of rock art	Type of depiction	Geometric or abstract motifs	Figurative motifs	Dimensions of surface (width × height) in m	Orientation of rock face	Lithology	Location	Geomorphology	North latitude	West longitude	Elevation (m a.s.l.)		
1	<i>Piedra de los Monos</i> pictograph	Pictography	Mixed	Opposing triangles joined by apex, and same design enclosed by circle	Hands in profile, one of the monkeys looking at the observer, two anthropomorphic figures in profile, one of them holding a cane or a spear, the <i>Sol de los Pastos</i> symbol, two anthropomorphic schematic figures looking to the observer, both lacking their left lower limb, crescent moon-shaped hat?	50×20 (outcrop dimensions)	NW-SE	Fine-grained basaltic andesites with columnar jointing	Guaítara river canyon, Frontales rural settlement, Potosí municipality	Steep slope on mid flank of left hillside of river	0.8056	77.59491	2,611	§, ☐	Evidence of an additional poorly-preserved pictograph. Vandalized. The site was named as Potosi 1-Po pictograph in Cabrera (1966, page 396). The author notes that the elements are thick, large. Most of them are red but there are some white lines used to complement one figure and to draw separate ones. Figures are very blurred. See Figure 2 and Supplementary material 4 of the paper to locate the motifs that are reminiscent of volcanism or volcanic shapes.
2	<i>Los Urapanes</i> 1 petroglyph	Petroglyph	Mixed	Spiral	Monkey in profile looking towards observer	2.5×2	NE-SW	Scoriaceous lava	Los Urapanes farm, Briceño rural settlement, Mapachico locality, Pasto municipality	Rocky outcrop on colluvial deposit, vertical lower wall	1.24607	77.31109	2,530	§	-
3	<i>Los Urapanes</i> 2 petroglyph	Petroglyph	Abstract	Spiral	-	1.8×1.6	NW-SE	Scoriaceous lava	Los Urapanes farm, Briceño rural settlement, Mapachico locality, Pasto municipality	Small depression in colluvial deposit, inferior wall has 45° slope	1.24701	77.31173	2,544	§	-
4a	<i>El Higuérón</i> pictograph	Pictograph	Abstract	Opposing triangles joined by apex with wavy lines, opposing straight lines, rectangle, symbol similar to letter “J” o “F” or both	-	Visible width at base: 6.7; visible width at top: 5; height: 10. Top is partially covered by roots and moss	NE-SW	Andesites with columnar jointing	Briceño rural settlement, Mapachico locality, Pasto municipality	Rock mass with vertical slope, fractures, thermal-contraction joints of varying geometry, next to small stream	1.24171	77.31202	2,560	§	See figure 6 of the paper for an artistic view of the pictograph from local artist D. A. Gómez, who actually saw the rock art site many times. Pictograms observed by the authors in the field do not correspond to those reported in literature (compare with 4b, which is the description of Cabrera, 1966) and see page 396 of the same publication; also see the descriptions and drawings in page 2 of Quijano (2009).
4b	13-P Pictograph	Pictograph	Mixed	Two red-colored right hands, very small and perfect; opposing triangles joined by the apex with an arrow that points to them; symbol similar to an “X” crowned by a “T” and an “E” that is sideways	Zoomorphic figures	4 m²	-	-	Vertical rocks, similar to small cliffs, a dihedral angle is formed with two surfaces, forming a 90° angle, drawings on both faces	-	-	-	-	☐	Yellow paint. One of the hands seems feminine. Located on El Higuérón creek, 80 m from Los Cano quarry, road Pasto-Sandoná, K6. See page 396 of Cabrera (1966).
5	1-P Petroglyph	Petroglyph	Mixed	Rectangles formed by opposing triangles joined by apex that contain triangular spirals; circles; curved lines; straight lines, and spiral	Climbing monkey in profile	7×2	-	-	North of Pandiaco neighborhood, Pasto municipality	To the right of Pasto river, near Villota Father cave	-	-	-	☐	It was destroyed, but photographs of the monolith were preserved. Drawings might not accurately correspond to photographs. See page 397 of Cabrera (1966).
6	2-P Petroglyph	Petroglyph	Mixed	Straight lies forming zoomorphic figure (monkey); curved lines; square that contains straight lines forming abstract figures	Zoomorphic figure	3×1.8	-	-	El Tejar neighborhood, Pasto municipality	Slightly above average terrain plane	-	-	-	☐	Weathered, includes zigzag lines.

table S2 continued.

Semiotics and visual narrative									Spatial aspects					Bibliography	Observations
No.	Site name	Type of rock art	Type of depiction	Geometric or abstract motifs	Figurative motifs	Dimensions of surface (width × height) in m	Orientation of rock face	Lithology	Location	Geomorphology	North latitude	West longitude	Elevation (m a.s.l.)		
7	4-P Petroglyph	Petroglyph	Abstract	Incomplete spiral	-	0.42 (diameter)	-	-	70 m from La Chorrera site, Pasto municipality	-	-	-	-	☐	On vertical face projecting out of the ground.
8	5-P Petroglyph	Petroglyph	Abstract	Complete spiral	-	-	-	-	Pandiaco neighborhood, Pasto municipality	-	-	-	-	☐	Petroglyphs 5-P to 11-P were found together, on Miss Villota property, and to the north near the tourism Hotel.
9	6-P Petroglyph	Petroglyph	Abstract	Square that contains a tree-like or figure of cone with mushroom-like or bulbous cloud at top, lines that form a “Y”	-	-	-	-	Pandiaco neighborhood, Pasto municipality	-	-	-	-	☐	Very deteriorated. Petroglyphs 5-P to 11-P were found together, on Miss Villota property, and to the north near the tourism Hotel. See page 397 of Cabrera (1966).
10	7-P Petroglyph	Petroglyph	Abstract	Complete spiral, divides by straight line that crosses in the middle, dotted on one side and continuous on the other	-	-	-	-	Pandiaco neighborhood, Pasto municipality	-	-	-	-	☐	Petroglyphs 5-P to 11-P were found together, on Miss Villota property, and to the north near the tourism Hotel
11	8-P Petroglyph	Petroglyph	Abstract	Two complete spirals, one is bigger and positioned above the smaller one	-	-	-	-	Pandiaco neighborhood, Pasto municipality	-	-	-	-	☐	Deteriorated and vandalized.
12	9-P Petroglyph	Petroglyph	Abstract	Curved lines shaped like a “C”; another one forms the start of a spiral; one line has one end forming a spiral and the other forms a “Y”	-	-	-	-	Pandiaco neighborhood, Pasto municipality	-	-	-	-	☐	Vandalized.
13	10-P Petroglyph	Petroglyph	Abstract	Spirals; curved lines in the form of “S” with spirals on the ends; parallel convex lines; nested triangles	-	2×1.5	-	-	Pandiaco neighborhood, Pasto municipality	-	-	-	-	☐	On the top surface of a stone, contains lines that are 1 cm wide and 0.3-0.5 cm deep. See page 397 of Cabrera (1966).
14	11-P Petroglyph	Petroglyph	Abstract	Spirals; curved lines; straight lines that cross each other	-	-	-	-	Pandiaco neighborhood, Pasto municipality	-	-	-	-	☐	Petroglyphs 5-P to 11-P were found together, on Miss Villota property, and to the north near the tourism Hotel.
15	12-P Petroglyph, also known as <i>Piedra de Guagua Rayo</i> or the <i>Vuelta Larga</i>	Petroglyph	Abstract	Squared spirals inside cells; lines that cross each other (zigzag pattern); circular spiral; “S”-shaped spirals; anthropomorphic figure	-	20×8	-	-	Villamaria rural settlement, Genoy locality, Pasto municipality	Rock with vertical surface	1.24976	-77.32262	2,581	☐, §, £	Along the Vuelta Larga site, near a quarry, on the Pasto-Sandoná road, K-9. Depth of etching ~0.5 cm; zigzag pattern could represent the volcano (T. Fierro, pers. comm 2022); poorly preserved, affected by older quarry operation (¿?), transit of vehicles, humidity and biofilms. See Figure 5 and Supplementary material 4 of the paper. Also compare with the drawing in page 397 of Cabrera (1966) and the drawings and photos in pages 254-258 of Cárdenas (1988).
16	1-CS petroglyph	Petroglyph	Abstract	Straight lines; irregular lines; stairs-like design partially enclosed in a square; irregular lines form a somewhat circular or star-like form	-	2×1.3	-	-	The site was formerly known as El Tejar farm, old land division	Smooth surface with 10°-15° slope	-	-	-	☐	-

table S2 continued.

Semiotics and visual narrative									Spatial aspects					Bibliography	Observations
No.	Site name	Type of rock art	Type of depiction	Geometric or abstract motifs	Figurative motifs	Dimensions of surface (width × height) in m	Orientation of rock face	Lithology	Location	Geomorphology	North latitude	West longitude	Elevation (m a.s.l.)		
17	2-CS petroglyph	Petroglyph	Mixed	Spirals of different sizes; irregular straight lines	Zoomorphic figures	3×1.8	-	-	The site was formerly known as El Tejar farm, old land division	-	-	-	-	☐	Blurred designs, possibly affected by weathering
18	3-CS petroglyph	Petroglyph	Abstract	Converging straight lines that do not join; cross-cut by another straight line and enclosed by an irregular contour	-	1.5×1.5	-	-		Protrudes 0.6-1 m above mean surface level with 10-15° slope	-	-	-	☐	Four additional rounded figures and a small blurred zone
19	4-CS petroglyph	Petroglyph	Abstract	Spirals, irregular and straight lines	-	1 m²	-	-	Upper sector of San Antonio pastureland, near the old Pasto-Consacá road	-	-	-	-	☐	Located on the upper part of San Antonio pastureland. There have been some digging around the stone, which has good foundation
20	5-CS petroglyph	Petroglyph	Abstract	Several spirals of different sizes, some joined by an irregular line; everything is enclosed by an irregular contour	-	2.5×1.5	-	-	To the right of the Consacá-El Tejar road	Surface with 10-15° slope	-	-	-	☐	Figures are weathered. Located on the right side of the Consacá-El Tejar road
21	6-CS petroglyph	Petroglyph	Abstract	Spirals with different sizes; straight lines; everything enclosed by an irregular contour	-	1.5 m²	-	-	Coffee plantation near Churupamba creek, before its mouth on the Azufral river	-	-	-	-	☐	There has been some digging in the surroundings. The stone has been turned and it probably has figures that are hidden from view. See page 398 of Cabrera (1966)
22	7-CS petroglyph	Petroglyph	Abstract	Spiral in the shape of an “S”. An additional spiral has irregular lines	-		-	-	Bomboná land division	-	-	-	-	☐	Located on the Bomboná land division
23	8-CS petroglyph	Petroglyph	Abstract	Zoomorphic figure (monkey)	-	0.3	-	-	Vista Hermosa ranch, neighboring El Tejar	-	-	-	-	☐	Almost at ground level, in a coffee plantation
24	9-CS petroglyph	Petroglyph	Abstract	An spiral enclosed by an arched line	-		-	-	Bomboná land division	-	-	-	-	☐	Some ceramics were unearthed, but they do not have relation with the etchings. See page 399 of Cabrera (1966).
25	11-CS petroglyph	Petroglyph	Abstract	Two groups of etchings, both of them limited and enclosed by lines; each group contains straight lines of different sizes. The upper group is more densely populated than the lower one	-	Total height: 2 m. Upper face: 1.3 m (height); lower face: 0.7 m (height)	-	Conglomerate	Bomboná land division	-	-	-	-	☐	Stone still shows thick and deep etchings, very weathered. Superior face includes a road-like feature near its lower margin. The inferior face is vertical and is the continuation of the superior one (some markings cross the limit between the two faces). Is some parts, the etchings are 3 cm deep and 5 cm wide. Together with 9-CS, 12-CS, and 13-CS forms a group located in the Bomboná land division
26	12-CS petroglyph	Petroglyph	Abstract	Several spirals with different sizes, some joined by an irregular line. Everything is limited to the top by an arched line	-	3.5×2	-	-	East of Bomboná village	-	-	-	-	☐	Disintegrated. See page 398 of Cabrera (1966)
27	13-CS petroglyph	Petroglyph	Abstract	One spiral; straight lines that form a net-like pattern; limited at the top by an arched line	-	1.2 (height)	-	-	Bomboná land division	-	-	-	-	☐	Stone face is vertical and triangular, blurred markings

table S2 continued.

Semiotics and visual narrative										Spatial aspects				Bibliography	Observations
No.	Site name	Type of rock art	Type of depiction	Geometric or abstract motifs	Figurative motifs	Dimensions of surface (width × height) in m	Orientation of rock face	Lithology	Location	Geomorphology	North latitude	West longitude	Elevation (m a.s.l.)		
28	14-CS petroglyph	Petroglyph	Abstract	Three joined spirals forming a <i>triskelion</i> . Enclosed by an arched contour with flat base	-	-	-	-	Bomboná land division	-	-	-	-	☐	Very blurred design. See page 398 of Cabrera (1966)
29	<i>Los Machines</i> petroglyph (1-Cu)	Petroglyph	Mixed	Figures in high relief. Animal figures, two four-legged figures with lowered tails joined by the snout; human-like figure; two concentric circles that contain two sets of straight lines, each composed of two parallel lines. One set is horizontal and the other one is vertical and orthogonal to the first. This is known as the <i>Sol de los Pastos</i> symbol	Anthropomorphic and zoomorphic figures	1.5×1.0	E-W	Basaltic andesite, vesicular and porphyritic. Abundant white feldspar crystals in vitreous and microcrystalline black groundmass	Machines (Tasmag) rural settlement, Cumbal municipality	The stone could be a large loose boulder or an outcropping part of the terminus of a lava flow. Although the general area has low relief and smooth slopes, the rock masses nearby exhibit steep slopes and locally vertical slopes that are in part of anthropic origin (quarry operations)	0.911365	77.809695	3,208	☐, §	Located roughly 2 km northeast of Cumbal, on the right side of the Cumbal-La Laguna road. It could have more designs, but the other exposed surfaces are covered by moss and lichens and partially covered by vegetation. Although the stone is easily accessed, the observation of the etched face is difficult because its slope. There are several quarries nearby where volcanic rocks are extracted
30	<i>Berruecos</i> petroglyph (1-Be)	Petroglyph	Abstract	One dotted straight line divides the petroglyph into two areas: the lower one contains four triangles joined at the apexes forming a square; the upper area contains wavy lines ending in partial spirals and curves forming complex, indistinguishable figures; another ax-like figure formed by union of straight and curved lines	-	7×4	-	-	To the east of Berruecos, Arboleda municipality	The flattened-upper face protrudes > 1 m above mean ground level	-	-	-	☐	Fair preservation state. Located in a cultivated field. See page 398 of Cabrera (1966)
31	<i>Chapacual</i> petroglyph (1-Y)	Petroglyph	Figurative	-	Zoomorphic figures	2.5 m²	-	-	Chapacual ranch; Yacuanquer municipality	-	-	-	-	☐	The monolith has been turned or shifted
32	<i>Los Infieles</i> petroglyph (1-SP)	Petroglyph	Mixed	Straight lines; curved lines, irregular lines; circles	Zoomorphic figures	2×3	-	Conglomerate	La Cañada site, San Pablo municipality	-	-	-	-	☐	Part of the figures are weathered. See page 399 of Cabrera (1966)
33	<i>La Cañada</i> petroglyph (2-SP)	Petroglyph	Figurative	-	Zoomorphic figures (monkeys)	-	-	Conglomerate	La Cañada site, San Pablo municipality	-	-	-	-	☐	Figures are heavily weathered
34	<i>Piedra del mono</i> petroglyph	Petroglyph	Mixed	Spiral in the shape of an “S”	Zoomorphic figure (monkey)	1,6×1,45×0.9	-	Scoriaceous lava with porphyritic texture	La Palma farm, La Marquesa-El Tambor rural settlement, Yacuanquer municipality	Smooth slope	1.12081	-77.37523	2,883	§	Moderate preservation state, fractured, biofilms and moss. Stone was originally buried under a tree, near an excavated pastureland, and was discovered during highway construction works.

table S2 continued.

Semiotics and visual narrative									Spatial aspects					Bibliography	Observations
No.	Site name	Type of rock art	Type of depiction	Geometric or abstract motifs	Figurative motifs	Dimensions of surface (width × height) in m	Orientation of rock face	Lithology	Location	Geomorphology	North latitude	West longitude	Elevation (m a.s.l.)		
35	Cueva Piedra Laja pictograph	Pictograph	Figurative	-	Anthropomorphic/zoomorphic figure	5×2	-	Scoriaceous andesite	Aguapamba Alto rural settlement, Genoy locality, Pasto municipality	Alluvial fan with a hummock-like landform in the direction of the apex, small cave on right margin of valley	1.25075	-77.33905	2,798	§	Poorly preserved, vandalized. Some ceramic fragments and a 10 cm-long piece of carved rock with polygonal cross section were found at the site
36	Tulpa de Güel petroglyph (engraving)	Seven Petroglyph or engraving	Abstract	Polygonal pattern with seven inscribed circles	-	0.3×0.3	-	Likely volcanic, rounded, boulder-size fragment	Tasmag rural settlement, Cumbal municipality	Pastureland, steep slope of hillside	1.030128	77.899079	2,552	¥	Loose boulder with engravings that was part of a “Tulpa”, one of the three stones that were typically used as base for stoves or bonfires. The fragment has been likely moved from its original location near a hut

§=Field survey format; □ = Cabrera (1966); £=Cárdenas (1988); ¥= Tarapués (2022). See table at the end for an explanation of each category
Categories or descriptors used for rock art sites.

Number	Category	Explanation
1	Site name	Provided it has a well-known name, otherwise assign a name according to location and what it represents
2	Type of rock art	Pictograph or pictogram (paint was used), high-relief petroglyph (carving), low-relief petroglyph (carving), mixed (pictograph and petroglyph)
3	Type of depiction	Whether the representation is abstract, figurative (naturalistic), or mixed
4	Geometric or abstract motifs	Using names of simple shapes (circles, squares, triangles, lines, etc.) and their variants or particularly complex details (opposing triangles joined by the apexes; concentric squares; spirals, parallel lines, zigzag lines, etc.)
5	Figurative motifs	Recognizable realistic objects or images (human figure, monkey, frog, spear, volcano, lightning)
6	Dimensions of surface	Width and height (m) or area (m²) where representations are concentrated
7	Orientation of rock face	General direction of the horizontal line parallel to rock face
8	Lithology	Textural and/or compositional description of rock used
9	Location	Name of the place (municipality, rural settlement, farm)
10	Geomorphology	Main features of the local landscape (slope, attribute of terrain, name of geoform)
11	North latitude	Geographical coordinate in decimal degrees
12	West longitude	Geographical coordinate in decimal degrees.
13	Elevation	Altitude of site in m a.s.l.
14	Bibliography	Citation of publication or otherwise the source of information
15	Observations	Additional relevant information

Supplementary material 3

Base information on myths, legends, and folk tales reported in the literature and confirmed during interviews. See table at the end for an explanation of each category.

TABLE S3

No.	Name of myth, legend, or superstitious belief. Approximate translation provided	Location or geographical distribution	Cosmic entity	Terrestrial entity	Supernatural entity	Type of relation	Connotation	Bibliographic or ethnographic reference	Observations
1	<i>El duende</i> - “The Elf”	Several municipalities of the State of Nariño, including Pasto, Genoy, Samaniego	None	Water, river, waterfall	Magic being	Subordination	Punishment, terror	Urresty (2019); Herrera (2019)	The myth of The Elf is persistent, widespread. During interviews with inhabitants of the Mapachico locality, a related tale was heard about an elf that possessed a boy
2	<i>El taita Galeras</i> - “Galeras the Elder”	-	None	Mountain	Deity?, magic being?	Authority, reciprocity, mutualism	Valor	Urresty (2019); Calvache and Sánchez (2022)	The conception of Galeras volcano as a benign, yet irascible entity, has taken roots among the communities in the volcanic influence areas. The ideas that everyone must respect the volcano and not defy it or provoke its fury are also recurrent
3	<i>La Tururama, Jailima o madre tierra</i> -“The Tururama, Jailima or Mother Earth”	Genoy, Pasto	None	Volcanic ash	Female spirit of the forest, grotesque and ugly, with large breasts, found wherever there is volcanic ash and who feeds from it	Feeding	Fertility, food, energy, life	Mamián (2011)	“A very ugly old woman, big, with large breasts. If she could have you breastfed, it looks as if she’d kill you. She was found in nasty parts, headwaters or waterfalls. She could shriek like a boy, approaching wherever there was ash. Once in a while she’d go to the peasants’ shacks, up there in the forest, the next day there was no ash, the old woman would eat the ash”
4	<i>Juan Rayo o Genoy</i> - “Juan Lightning or Genoy”	Genoy, Pasto	None	Lightning, rain, stone	The patriarch and source of all Genoyans, born from a lightning and transformed into the volcano itself	Love and compassion	Fury, strength, distrust	Cepeda (2020)	“The story and belief passed on by the elders says that we are the children of Juan Lightning and the Virgin of the Rosary. Once upon a time it down poured and with the rain there was a lightning, thundering with terrifying echoes that made the earth tremble, and when that black-fire lightning landed, it did so in the boiling stone, a boy landed that was called Juan. And that is how the legend was born that where that lightning landed, no one was to leave here, that he was the owner, wherever the lightning landed Genoy was the owner. But since the lightning was still furious, then came the Virgin of the Rosary, as the wife, to calm him down. She landed on a stone in <i>Sachapamba</i> . That is where the elders found her. So, with so much strength it sprung up and with the Virgin’s help the lightning soothed. And so, we live and die with these two vital forces. When Juan Lightning gets angry, it rains, there is thunder, throws flames and lava. That is when the Virgin of the Rosary calms him down”
5	<i>La leyenda de Gualcalá (Hualcalá)</i> - “The legend of Gualcalá (Hualcalá)”	Túquerres, southern Nariño	None	Mountain, volcano, gold	-	Subordination, mutualism, punishment	Curse, distrust, warning, prohibition, sacrifice	Ocampo (1996); Montenegro (2013); Herrera (2019)	The Sun god created a mountain of gold for the <i>Pastos</i> , the gold sprung up melted through its flanks, and when another chief wanted to go to the <i>Hualcalá</i> , the Sun god bewitched him and thunder, lightning, wind, a stench, and a fog came upon them and gave them a sleepiness from which they did not wake”. The legend of gold associated to the mountain also appears in stories told by elders: “The Gualcalá, also called «God’s finger», ...is sustained by two pillars of gold, which moved through the earth until they reached the territory of Mallama,...”. The stories also mention that whomever tries to go to Gualcalá and take the gold with them, either will not stand the weight of it, or will be swallowed by the mountain

table S3 continued.

No.	Name of myth, legend, or superstitious belief. Approximate translation provided	Location or geographical distribution	Cosmic entity	Terrestrial entity	Supernatural entity	Type of relation	Connotation	Bibliographic or ethnographic reference	Observations
6	<i>La laguna encantada de Cumbal y el volcán</i> - “The Enchanted Cumbal Lagoon and the volcano”	Cumbal	None	Lagoon, volcano, lost city, gold	Spiritual beings, ghost, apparition	Marriage, couple’s love	Power, greed, trickering	Mamián <i>et al.</i> (1996); Herrera (2019); Cuaical and Sánchez (2018)	According to legend, the first men were born from the marriage between Cumbal Volcano and Cumbal Lagoon (also called <i>La Bolsa</i> Lagoon). There is a site located exactly at the foot of the volcano and the edge of the lagoon, called <i>La Piedra de los Guacamullos</i> (the Guacamullos Stone), were a ceramic pot appeared containing the first man and woman from which all inhabitants of the region originated. Other related myths tell of a beautiful woman that appears in the lagoon: “...amidst the bubbling tree of water, a naked enchanting woman appears, svelt...”
7	<i>La bruja María Tambora</i> - “María Tambora the Witch”	Túquerres, Sapuyes, Colimba	None	Volcano, lagoon, hill	Magic being	Authority, subordination	Distrust	Montenegro (2013)	“That time we had the fortune of seeing the road of the Tambora witch. Before, all this place was a lagoon-tells lady Rita-, the witch came out of Sapuyes and flew around the lagoon and she watched over the land, and she’d meet with the one from Mallama. She flew from Sapuyes and came and flew to some hills; there she found the hill of Colimba, which looks as if it had collapsed, as a quarry, that is the hill of Colimba, and yonder, behind it there is Cumbal volcano. She, the witch, went around in circles over the hills and circled around Azufral and all of <i>El Chupadero</i> , and went back to Sapuyes. Her name was María Tambora, she was the most powerful. They’d meet on the hill of Colimba to make plans with the one from Mallama”
8	<i>La leyenda de la Virgen del Rosario y el rayo o el fuego</i> - “The legend of the Virgin of the Rosary and the lightning or the fire”	Genoy	None	Volcano	Deity?, magic being?	Authority, reciprocity, mutualism	Strength, distrust	Perugache (2012)	“The legends about this virgin are quite interesting. The Genoyans say that she stayed in <i>Sachapamba</i> , a place that is now part of Bellavista rural settlement and where there are several <i>ojos de agua</i> . According to legend, the Virgin had to be taken to the church several times because she kept returning to the place where they found her, until, after flogging her several times, they had to cut off one of her feet to keep her from escaping. The virgin always appears in the Genoyans stories, often times in relation to Juan lightning or the lightning boy of lady Pascuala story. That the figurine had to be taken to the mouth of the volcano to calm him down, is nothing more than the dual relation between the water-represented by the virgin they found in Sachapamba- and the lightning or fire-clearly represented by the volcano”...“The house of the town of Genoy is supported on pillars of cut stone...”...“ <i>Don José Francisco Yaqueno</i> , one of the most important story tellers in town, often talks about Genoy being supported on huge stone pillars that burst forth from the mouths of Galeras volcano and get interred deep in their territory. <i>Don José</i> says that, because of this, the town of Genoy will never fail and much less disappear from history”

table S3 continued.

No.	Name of myth, legend, or superstitious belief. Approximate translation provided	Location or geographical distribution	Cosmic entity	Terrestrial entity	Supernatural entity	Type of relation	Connotation	Bibliographic or ethnographic reference	Observations
9	<i>Mito de las dos perdices</i> -“The Myth of the Two Partridges”	Nariño and Carchi Province (Ecuador)	None	Relief, jungle, sea, fertile lands, lagoons, rivers, volcanoes, climate	Magic beings	Fraternal love, authority	-	Mamián <i>et al.</i> (1996); Mueses (2015)	“Legend has it that the peoples of Pasto originated in the nest of <i>Huanca</i> , or the nest of the <i>Pastos</i> , from two beings: <i>El Chispas</i> and <i>El Guangas</i> , or from two women that transformed into partridges, one black and one white. They came from two different places, they met, and by dancing, talking, and fighting, they formed towns and places, shaped the terrain, decided the place for the jungle, the sea, the fertile lands, lagoons, rivers, volcanoes, and the weather. Also they assigned the sacred and spiritual spaces, the world of the living and of the dead, and the place where mother nature keeps her secrets”. According to legend, the white partridge won the fight and turned the black partridge into the Gualcalá volcanic mountain. The profile of this mountain is reminiscent of the facial features and the dress of the black partridge or the Guangas
10	<i>Respetar a Urcunina</i> -“Respect for Urcunina”	Mapachico locality	None	Urcunina volcano, birds, oxen, Eucalyptus tree	Spiritual Urcunina	Respect, veneration, taking root.	Communication among inhabitants, with the volcano, and the animals, through behavior and attitude	Interview with Andrés Gómez Narváez, an artist and scholar from Mapachico locality, Pasto. November 16 th , 2021	An anecdote is told about a father that scolds his son for neither greeting nor asking for permission to the volcano before starting the daily chores. Also there was mention of changes in behavior of animals moments before a volcanic seismic event
11	<i>Pacha mama/Madre territorio</i> -“Pacha mama/Mother Earth”	Cumbal	None	Water and fire	Spiritual Mother Earth	Veneration, respect	Conservation, caring	Tarapués (2013)	“This world is not as it looks now, what was inside was placed outside, when the fire met the water, then everything moved, the waters flashed through the rivers, eroded the volcanoes, mountains rose, paramoes sprouted, and in mud and gold, matter melted. The plants, lianas, bears, deer, and also the <i>shingusas</i> and <i>shingusos</i> , the Pastos appeared by the <i>Tuta</i> , by that spiral that leads to the sea, out of Mother Earth life sprung up and that is why she is considered mother”
12	<i>Urcunina, un ser temperamental</i> -“Urcunina, a Temperamental Being”	Mapachico locality	None	Urcunina volcano	Elf, very handsome boy	Respect, prudence	Temper, irascibility	Interview with Franco Gómez, an elder from Mapachico locality, Pasto, who works for the National Park Authority. November 15 th , 2021	-

table S3 continued.

No.	Name of myth, legend, or superstitious belief. Approximate translation provided	Location or geographical distribution	Cosmic entity	Terrestrial entity	Supernatural entity	Type of relation	Connotation	Bibliographic or ethnographic reference	Observations
13	<i>Puerta mágica</i> -“Magic Door”	Mapachico locality	None	<i>El Higuérón</i> Stone	Magic door, library	Enchantment, respect, prudence	Attraction	Quijano (2009); Gómez (2017)	One of the most well-known tales is about the link between the rock art site and the opening of a magic door every Holy Friday, allowing to observe a treasure that is related to a library that can be obtained by those who do not end up bewitched by the energies of the site. “Our grandfathers and fathers told us that we should not go there, especially during the Holy Week, because, come Holy Friday, the site opens up and a library can be seen, then, that’s why they said not to go there, because it could open up, and then one could become hexed. That was the belief there was about that place”. Likewise, Mrs. Marcionila Botina noted that “about seventy years ago, the elders said that during the Holy Week the site opened up and lots of books could be seen, but it was forbidden to enter there. There was a black dog that laid there watching over the place. That’s why we never passed through here”. A recent analysis of <i>El Higuérón</i> Pictograph as an ancient artwork suggested that it represents a door through which spectators can get inside a worth-seeing, yet ignored reality
14	<i>El duende o el diablo</i> (The elf or the devil)	Coconuco and Paletará indigenous reserves	None	Moors, volcanoes, lakes, rivers	Spiritual beings with ambiguous power: elf, the devil, San Miguel (St. Michael)	Respect, reciprocity	Disease, richness, death	Mamián <i>et al.</i> (1996); Patiño and Monsalve (2019)	The wild areas are related to spiritual beings with dual power. The high parts of the Andes (volcanoes, moors, lakes) are said to be “fierce”, meaning being capable of forming storms whenever a stranger or noisy person enters the territory. An elf is believed to live near rivers (Paletará indigenous reserve) or near rock masses and mountains (Coconuco indigenous reserve). The moors are home to the “Jucas” or the devil. In the village of Puracé it is said that Puracé Volcano is home to the devil, which is black and has red eyes, just like the volcano: black on the outside and red inside
15	The marriage of Chiles and Cumbal Volcanoes	Cumbal municipality and indigenous reserve, Chiles indigenous reserve and rural settlement	None	Volcanoes	Spiritual or superior beings	Respect, ancestry	Couple’s love, marriage, duality	Mamián <i>et al.</i> (1996)	It is said that the first humans were born from the marriage between Chiles and Cumbal volcanoes. The former located to the south represents the male and the latter, located further north represents the female. The volcanic mountains represent totality, synthesis of power. That is why they are the origin, the creators. It is said that the <i>cacique</i> Cumbe was born from inside of Cumbal volcano and that is where he lies vigilant to come back someday. The interior of the volcano is conceived as the home of this primordial elder

table S3 continued.

Descriptors used to systematize information on myths and legends.

Number	Category	Explanation
1	Name of myth, legend, or superstitious belief	Provided it has a well-known name, otherwise assign a subjective name according to theme
2	Location or geographical distribution	Place or places, at any geographical scale (local, regional, subcontinental) where the belief is known
3	Cosmic entity	The entity of the cosmos to which the belief refers to. It could be the sun, the moon, the stars, a comet, or the void in the cosmos
4	Terrestrial entity	Earthly or natural entity to which the belief refers to. It could be the rain, a cloud, the water, the monkey, the river
5	Supernatural entity	Fabulous or spectral entity to which the belief refers to. It could be a monster, a powerful hero, a deity, a magic being, a hybrid
6	Type of relation	Identification of typical connections of human interactions, such as rivalry, authority, couple's love, fraternal love, cooperation/reciprocity, subordination
7	Connotation	In the absence of a clear relation among the characters of a myth, or when the belief is only about a single character, this category expresses a central idea about said character
8	Bibliographic or ethnographic reference	Written or oral source for the information. For oral sources provide details such as: name of interviewed person, institutional or cultural affiliation, date of interview
9	Observations	Additional relevant information

Supplementary material 4

Digitized versions of the field survey forms of eight rock art sites in the State of Nariño (Colombia). For each form we have included an additional page showing photographic evidence and details of the rock art that was observed in the field. The sites are organized according to the Supplementary material 2 of the paper. Photo credits: In El Higuérón pictograph site field survey form; photos A, B, and D, are by Christian E. Chicaiza. All other photos are by John J. Sánchez. See table at the end for an explanation of each attribute.

Page 1

PREHISPANIC REPRESENTATIONS OF VOLCANOES IN NARIÑO
FIELD SURVEY FORM

Name of site: Piedra de los monos pictograph. **Latitude:** 0.80560. **Longitude:** -77.59491. **Elevation:** 2611.

Municipality: Potosí. **Locality:** Frontales. **Farm:** **Proprietor:**

Geoform: Guaítara River canyon, vertical rocky cliff, mid-flank.

Conservation: Evidences of vandalism.

Access: From the Pasto-Genoy highway, follow a steep stone paved road on private property. Last 40 m to site there is no visible by-path, lots of brushwood, near-vertical slope.

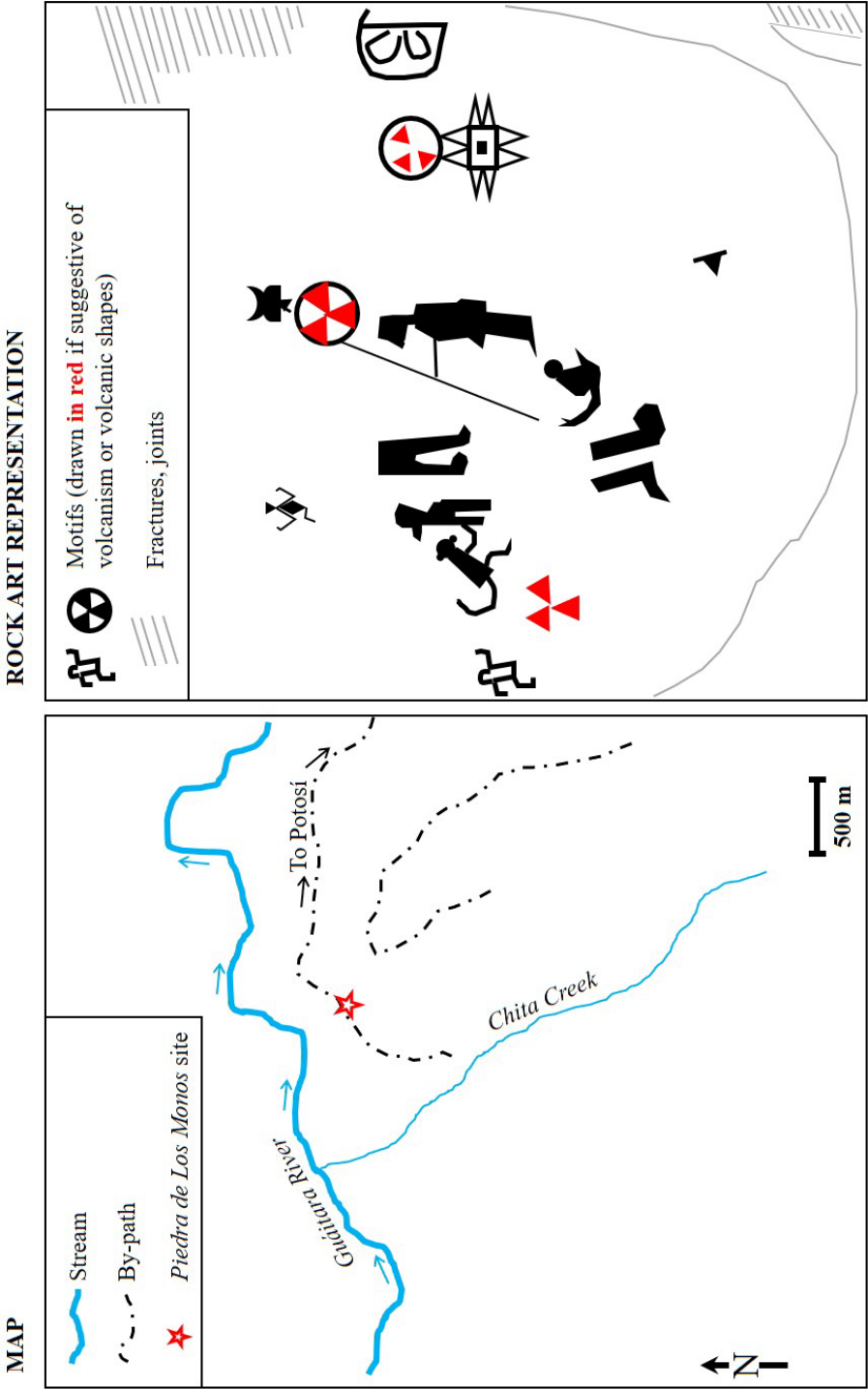
Time of record: 12:51 **Weather:** Foggy, occasionally sunlit.

Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Basaltic andesites, fine-grained groundmass, columnar jointing.	50-m-wide, 20- m-high outcrop.	Red. Orange. Black.	NW-SE.	None.	Does not apply.	Does not apply.	Only from some sectors of the neighboring rural settlement.	Steep slopes of Guaítara River left bank.

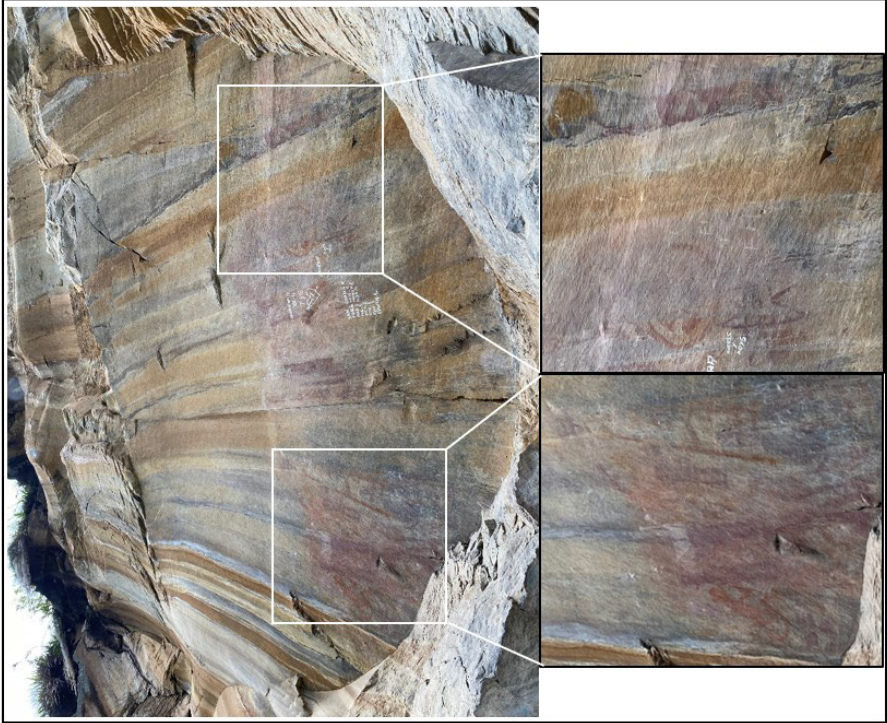
Observations: Restricted Access and visibility. Evidences of a poorly-preserved second pictograph, site has been vandalized.

Date: D 14 M 12 Y 2021

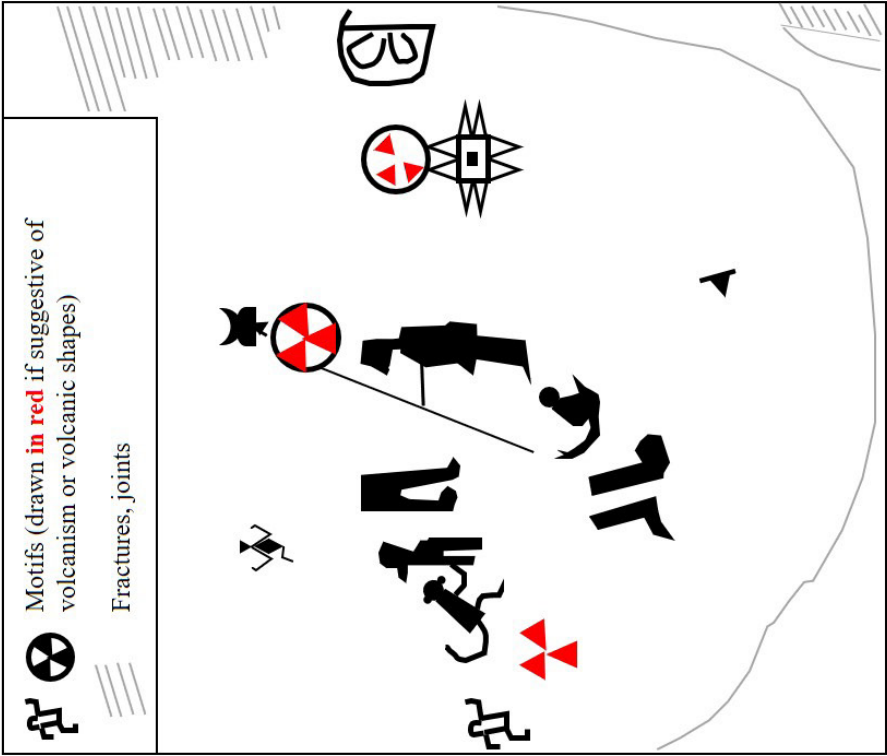
Name: William A. Posada.



PHOTOGRAPHIC EVIDENCE



ROCK ART REPRESENTATION

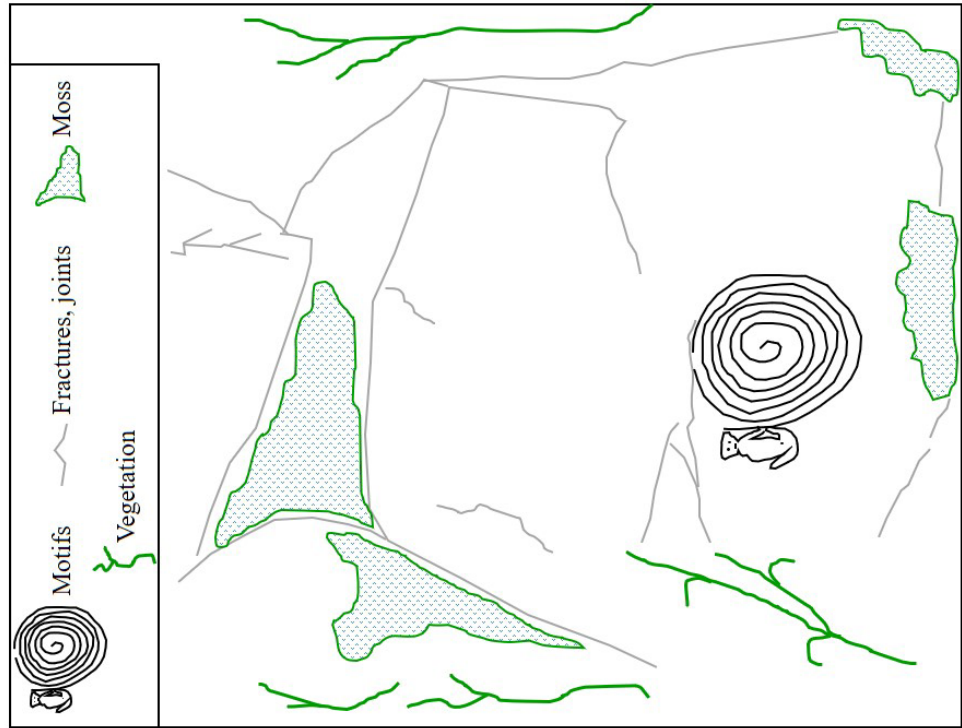


Name of site: Los Urapanes 1 petroglyph **Latitude:** 1.24607. **Longitude:** -77.31109. **Elevation:** 2530 m.
Municipality: Pasto, Genoy. **Locality:** Mapachico, Briceño. **Farm:** Los Urapanes. **Proprietor:** L. Figueroa.
Geoform: Rocky outcrop on colluvial deposit, vertical lower wall.
Conservation: Good.
Access: From Pasto-Genoy highway, turn right on Los Urapanes farm, in front of Briceño Alto quarry entrance.
Time of record: 11:52 am. **Weather:** Sunny.

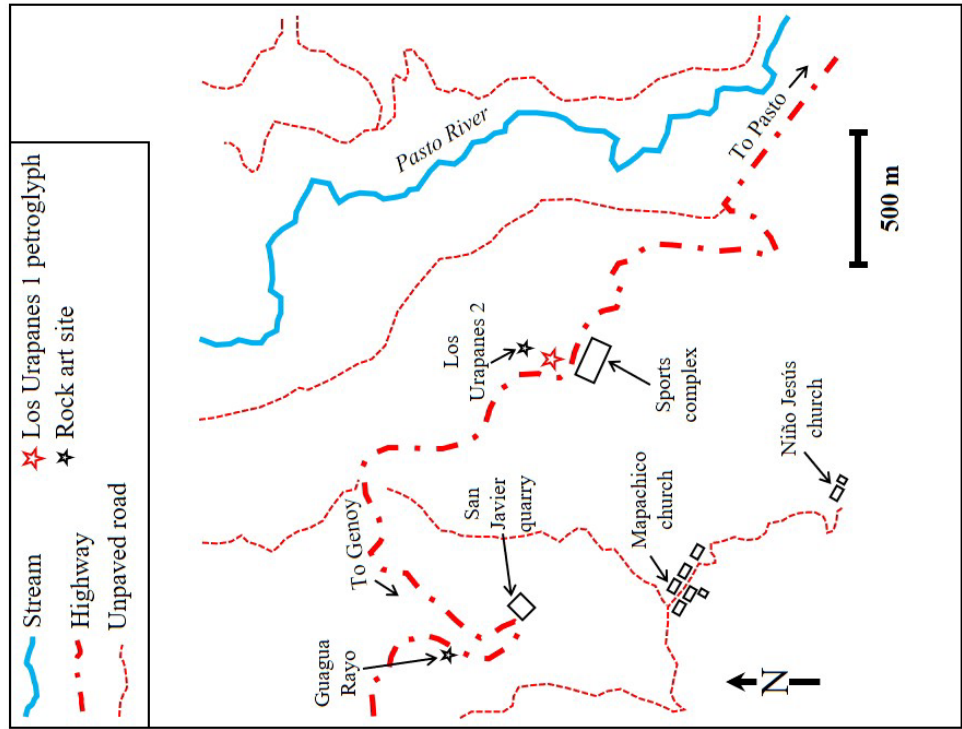
Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Scoriaceous lava.	Width: 2.5 m. Height: 2 m.		NE-SW.			2-3 mm.	Only from the site.	Neighboring house farm, Morasurco rural settlement.

Observations: Retaining wall built with rock fragments of scoriaceous lava.
Date: D 15 M 12 Y 2021 **Name:** Christian Chicaiza, William A. Posada, John J. Sánchez.

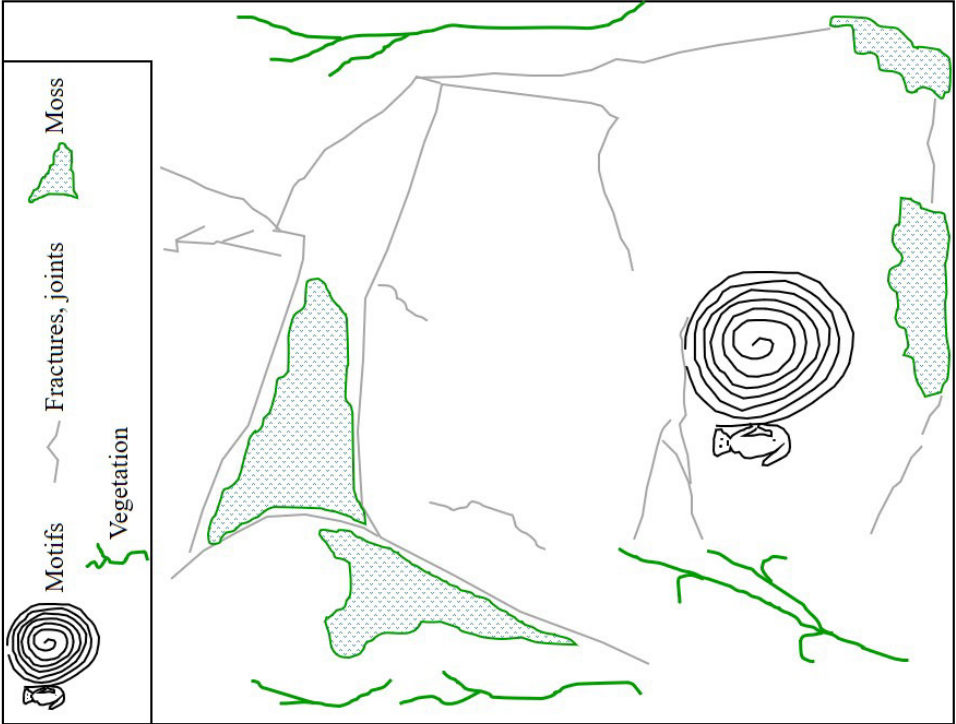
ROCK ART REPRESENTATION



MAP



ROCK ART REPRESENTATION



PHOTOGRAPHIC EVIDENCE



PREHISPANIC REPRESENTATIONS OF VOLCANOES IN NARIÑO
FIELD SURVEY FORM

Name of site: Los Urapanes 2 petroglyph **Latitude:** 1.24701. **Longitude:** -77.31173. **Elevation:** 2544 m.

Municipality: Pasto. **Genoy**. **Locality:** Mapachico, Briceño. **Farm:** Los Urapanes. **Proprietor:** L. Figueroa.

Geofrm: Elongated boulder with lower face at 45° slope.

Conservation: Good.

Access: From Pasto-Genoy highway, turn right on Los Urapanes farm, in front of Briceño Alto quarry entrance.

Time of record: 12:20 pm. **Weather:** Sunny.

Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Scoriaceous lava, thermally-jointed nearly-horizontal columns with scoriaceous top.	Width: 1.8 m. Height: 1.6 m.		NW-SE.			2-3 mm.	Barely visible from neighboring crops.	Pinasaco development, Pasto-Chachagüi highway.

Observations: Retaining wall built with rock fragments of scoriaceous lava.

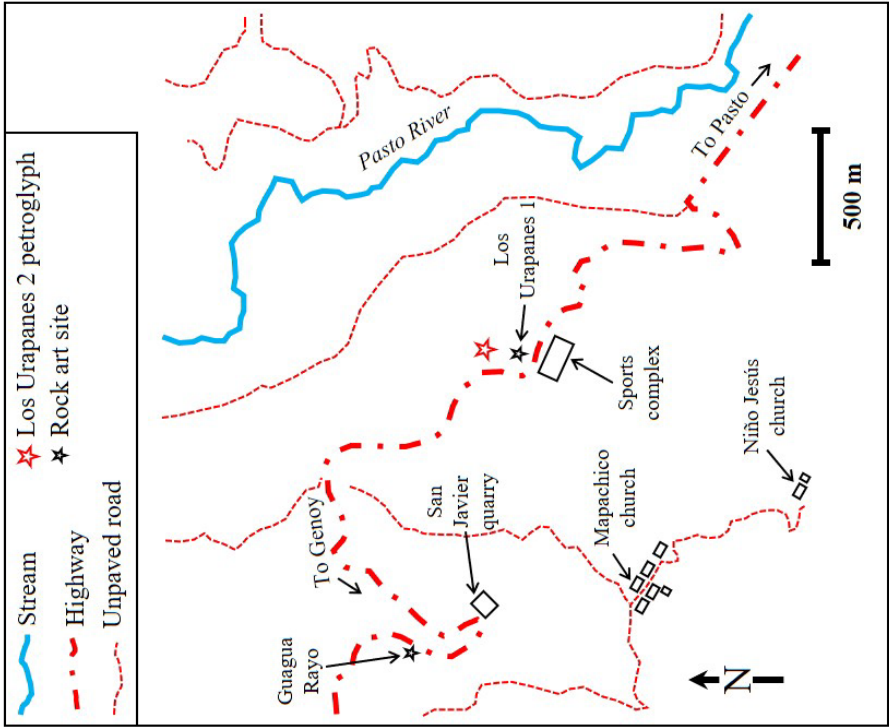
Date: D 15 M 12 Y 2021

Name: Christian Chicaiza, William A. Posada, John J. Sánchez.

ROCK ART REPRESENTATION



MAP



ROCK ART REPRESENTATION



PHOTOGRAPHIC EVIDENCE



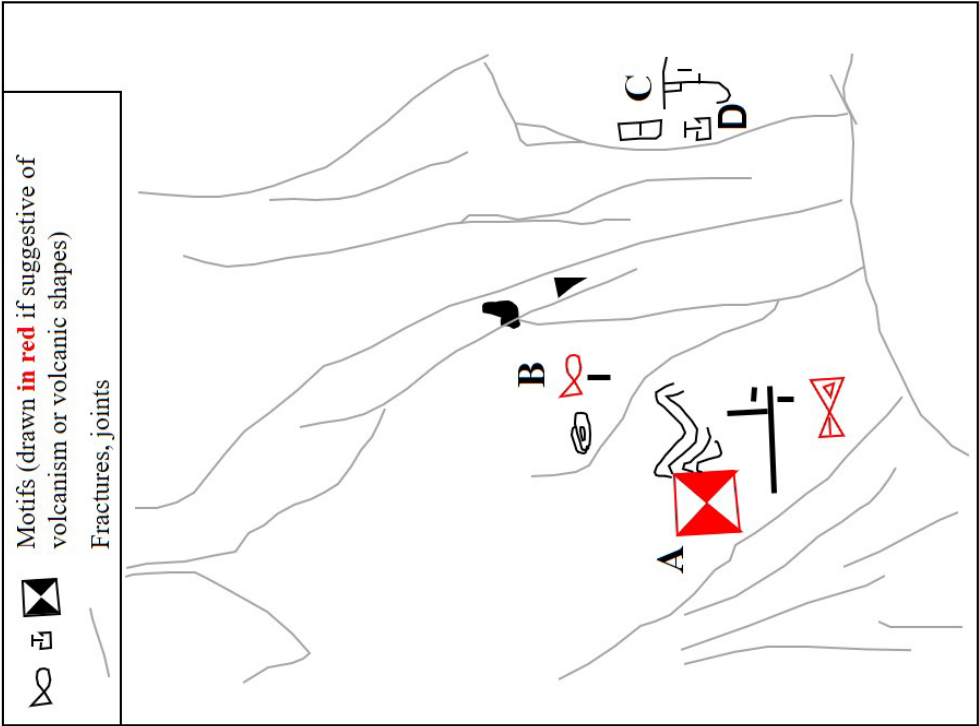
PREHISPANIC REPRESENTATIONS OF VOLCANOES IN NARIÑO
FIELD SURVEY FORM

Name of site: El Higuierón pictograph **Latitude:** 1.24171, **Longitude:** -77.31202, **Elevation:** 2560 m.
Municipality: Pasto, Genoy, **Locality:** Mapachico, Briceño, **Farm:** **Proprietor:**
Geoform: Rock mass with vertical slope, fractures, thermal-contraction joints of varying geometry, next to small stream.
Conservation: Poorly preserved, weathering, mass wasting, vegetation and roots, biofilms.
Access: Access following a by-path that crosses El Salto creek, entrance from Briceño quarry.
Time of record: 10:05 am, **Weather:** Foggy.

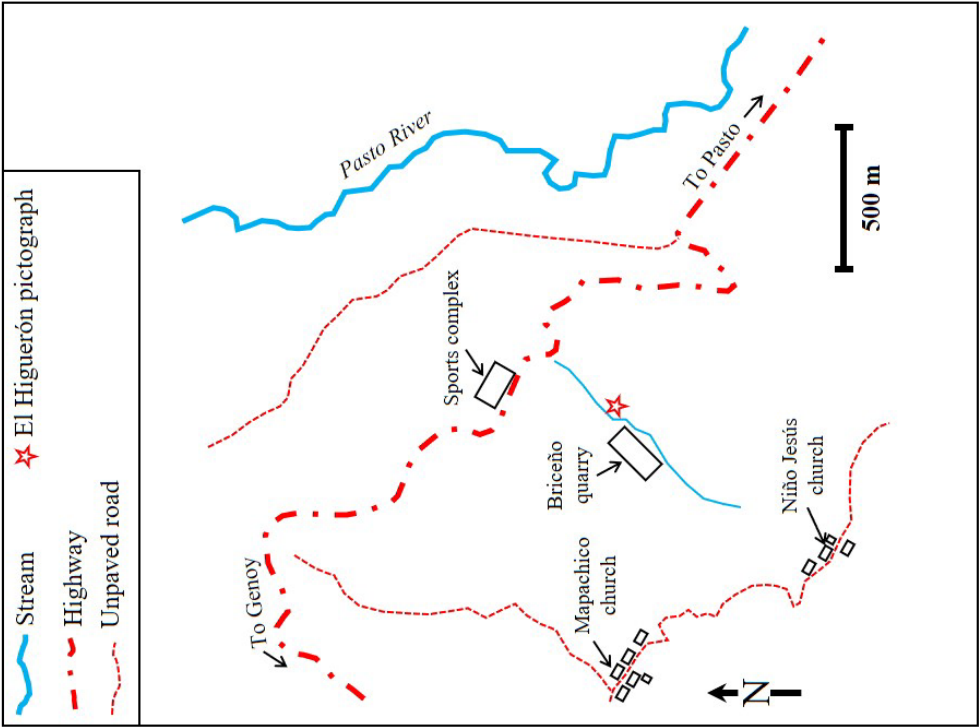
Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Andesites with columnar jointing.	Total width: 11.7 m 5 m visible, 6.7 m covered by roots. Height: 10 m.	Yellow, red.	NE-SW.				Only from the site.	Quarry, main house, pasturelands, El Salto creek is a few meters from the site.

Observations: Pictograms observed do not match those reported in the literature.
Date: D 15 M 12 Y 2021
Name: William A. Posada.

ROCK ART REPRESENTATION



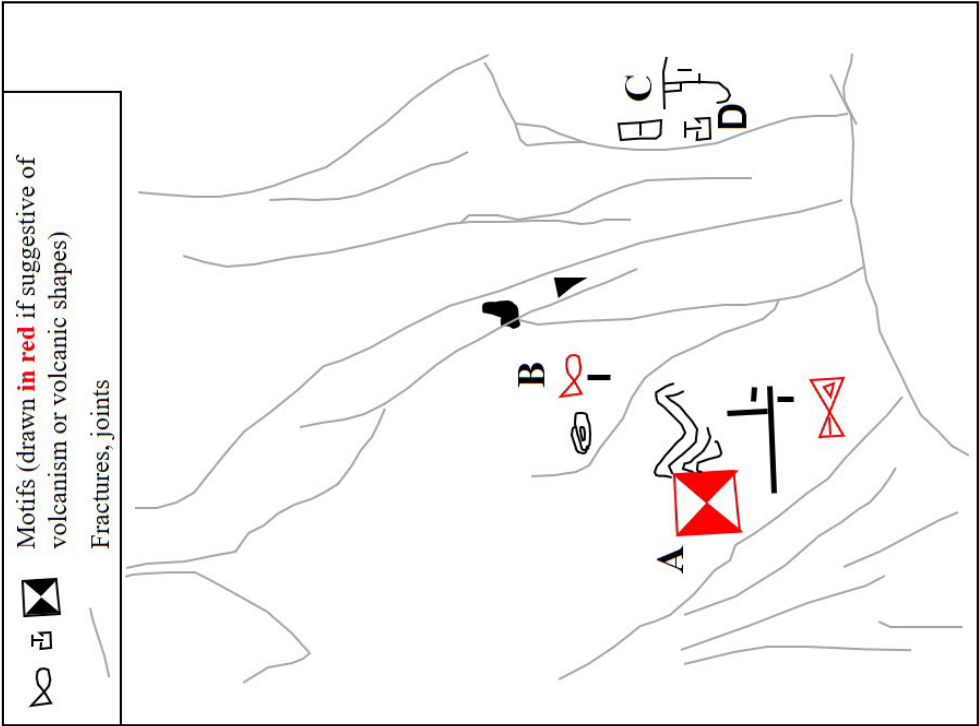
MAP



PHOTOGRAPHIC EVIDENCE



ROCK ART REPRESENTATION



Name of site: Piedra de “Guagua Rayo” petroglyph. **Latitude:** 1.24976. **Longitude:** -77.32262. **Elevation:** 2581.

Municipality: Pasto. **Locality:** Genoy. **Farm:** Proprietor:

Geoform: Rock mass with vertical slope, next to road cut.

Conservation: Precarious, affectation by old quarry activity (?), traffic, moisture, biofilms.

Access: Going along highway, from Genoy to Pasto, take a right on a steep, vegetated by-path. Concesur Plant above. Site is ~ 100 m from a Holy Virgin altar and ~300 from San Javier quarry.

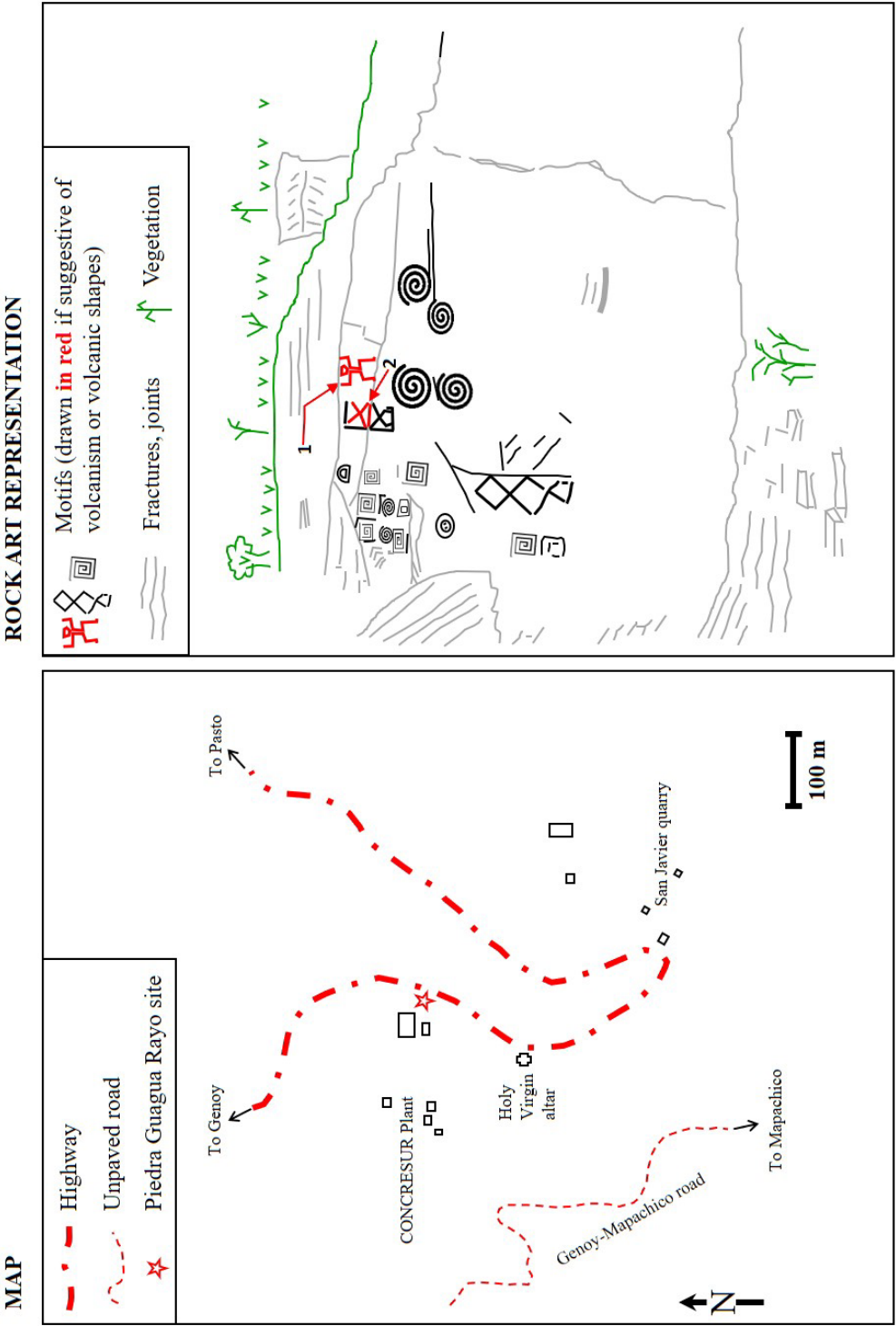
Time of record: 07:30 am. **Weather:** misty rain, fog.

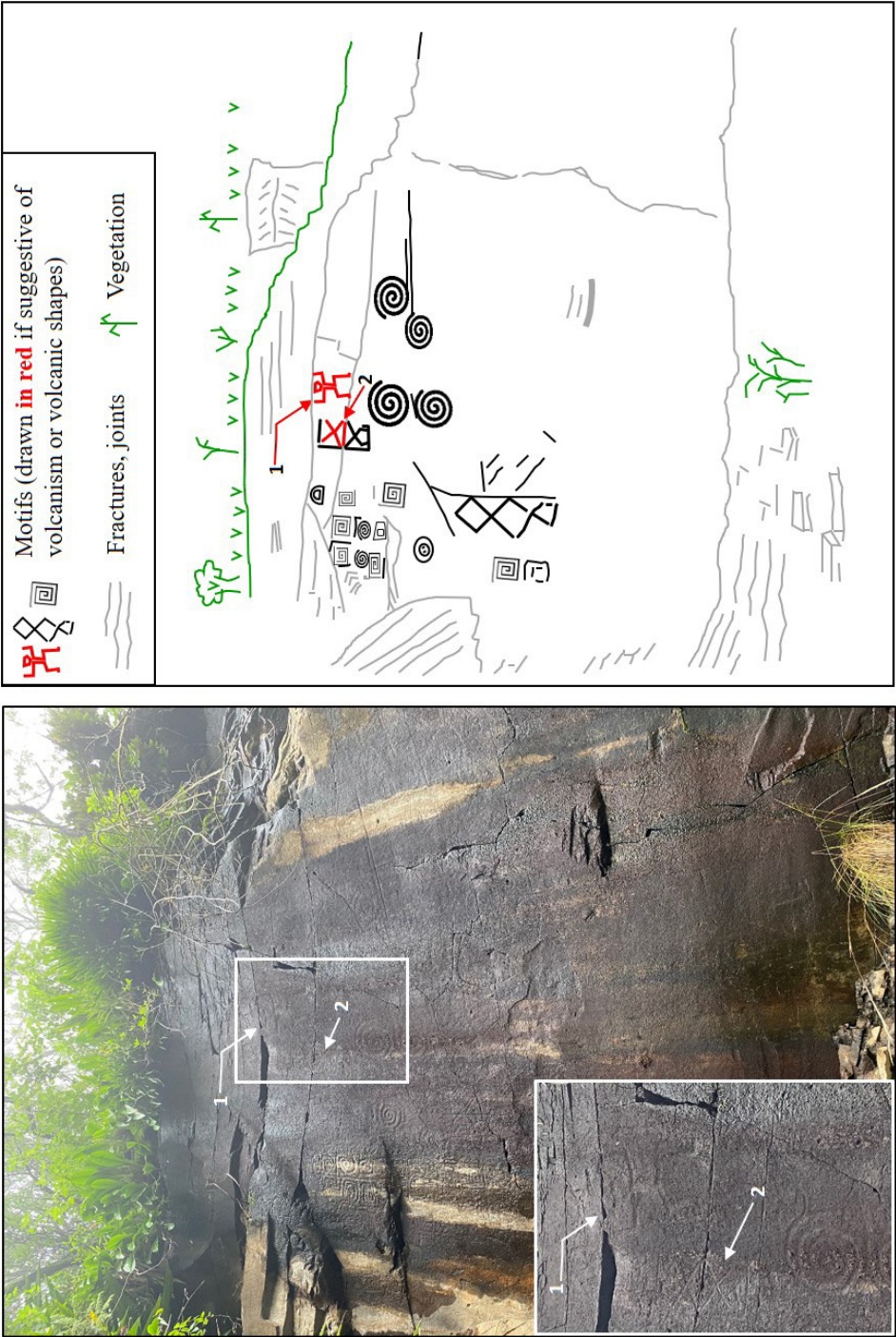
Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Andesites with columnar jointing.	20-m-wide, 8-m-high outcrop.					~0.5 cm?	Partially visible from the highway.	Pasto-Genoy highway.

Observations: Anthropologist T. Fierro Leyton, who guided us to the site, thinks the zigzag patterns could represent the volcano.

Date: D 19 M 12 Y 2021

Name: John J. Sánchez.

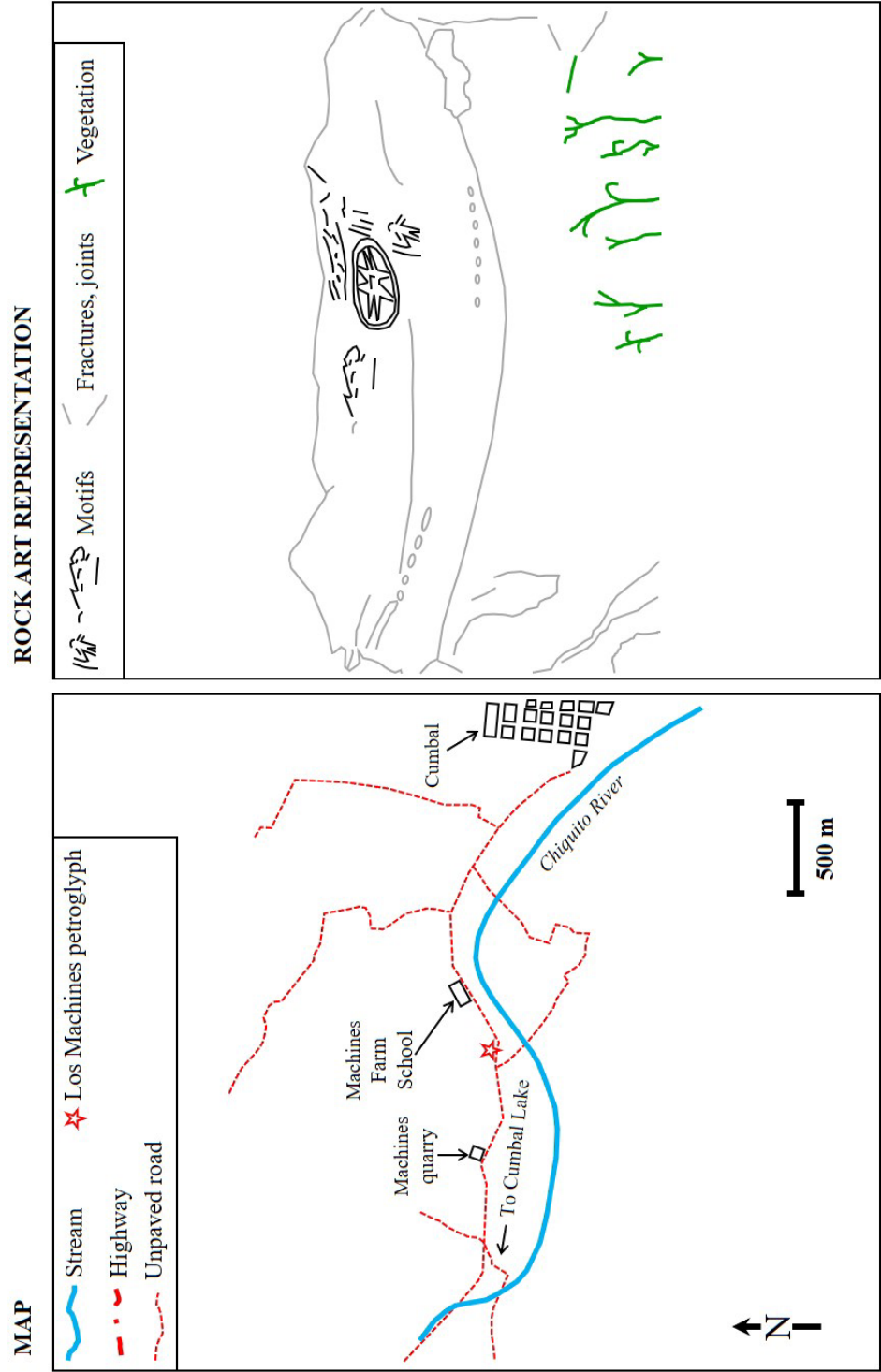




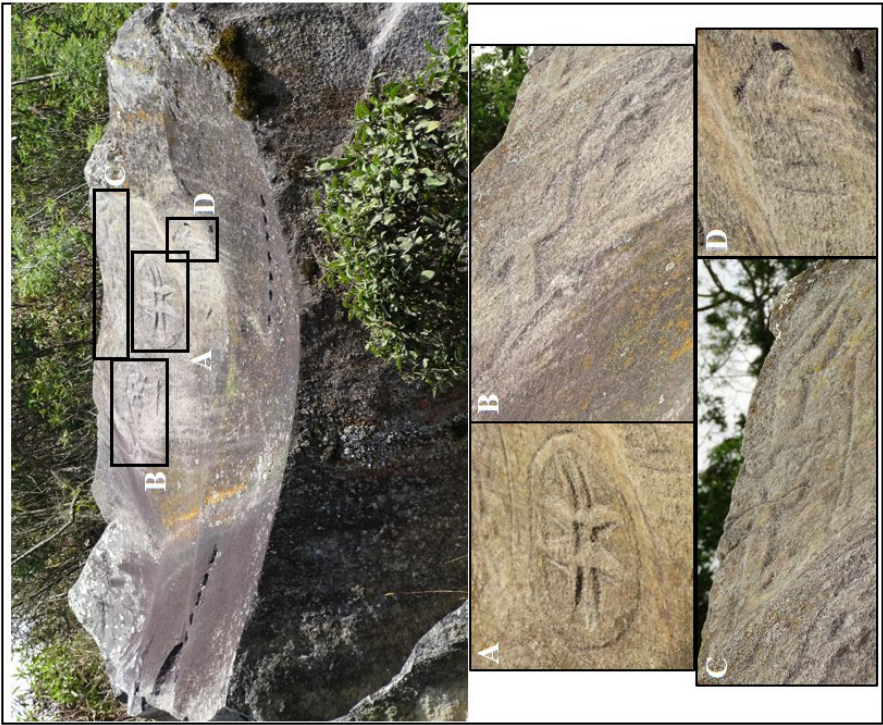
Name of site: Los Machines petroglyph **Latitude:** 0.911365. **Longitude:** -77.809695. **Elevation:** 3028 m.
Municipality: Cumbal. **Locality:** Tasmag (Machines). **Farm:** **Proprietor:**
Geofom: The general area has low relief and smooth slopes, but the rock masses nearby have steep slopes and locally vertical slopes that are in part of anthropic origin (quarry operations).
Conservation: Stone is covered by moss and lichens, and partially covered by vegetation. The site is easily accessed.
Access: From the Cumbal-La Laguna road, 300 m after passing Los Machines farm school, take a right near the first quarry, stone is just to the side of the road and there is a by-path to access it.
Time of record: 09:40 am. **Weather:** Clear sky, sunny.

Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Scoriaceous lava, with porphyritic and vesicular textures. Quarries nearby expose complex columnar jointing patterns.	Width: 1.5 m. Height: 1 m.		E-W.			3-5 mm.	Site is visible from the road and neighboring houses and pasturelands.	Nearby quarries, road, pasturelands and crops, outskirts of Cumbal.

Observations: Stone could be a large loose boulder or an outcropping part of the terminus of a lava flow. Observation of the etched face is difficult because its slope.
Date: D 15 M 12 Y 2021 **Name:** Christian Chicaiza, William A. Posada, John J. Sánchez.



PHOTOGRAPHIC EVIDENCE



ROCK ART REPRESENTATION



Page 1

PREHISPANIC REPRESENTATIONS OF VOLCANOES IN NARIÑO
FIELD SURVEY FORM

Name of site: Piedra del mono petroglyph. **Latitude:** 1.12081. **Longitude:** -77.37523. **Elevation:** 2883 m.

Municipality: Yacuanquer. **Locality:** La Marquesa-El Tambor. **Farm:** La Palma Proprietor: Teresa España.

Geofrm: Hillside with smooth slope. The stone was found under a tree, next to a pastureland with some excavations.

Conservation: Moderate state of preservation, weathered, cracks, biofilms, moss.

Access: From the Yacuanquer-Pasto highway (in direction to Pasto), take a right (to the east), stone is next to entrance to farm.

Time of record: 10:00 am. **Weather:** Foggy, drizzly.

Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Andesitic lava with scoriaceous surface, dense interior with porphyritic texture.	1.6-m-wide, 1.45- m-high 0.9 m depth.		NW-SE, but stone has been moved and rotated.			1 cm.	From Pasto-Yacuanquer highway, probably from Yacuanquer.	Yacuanquer, El Cebadal, Biomax gas station, river valley, some neighboring farms.

Observations: During the road work, the Stone was fragmented, there is a second block that was left 5 m to the south but it does not have etchings.

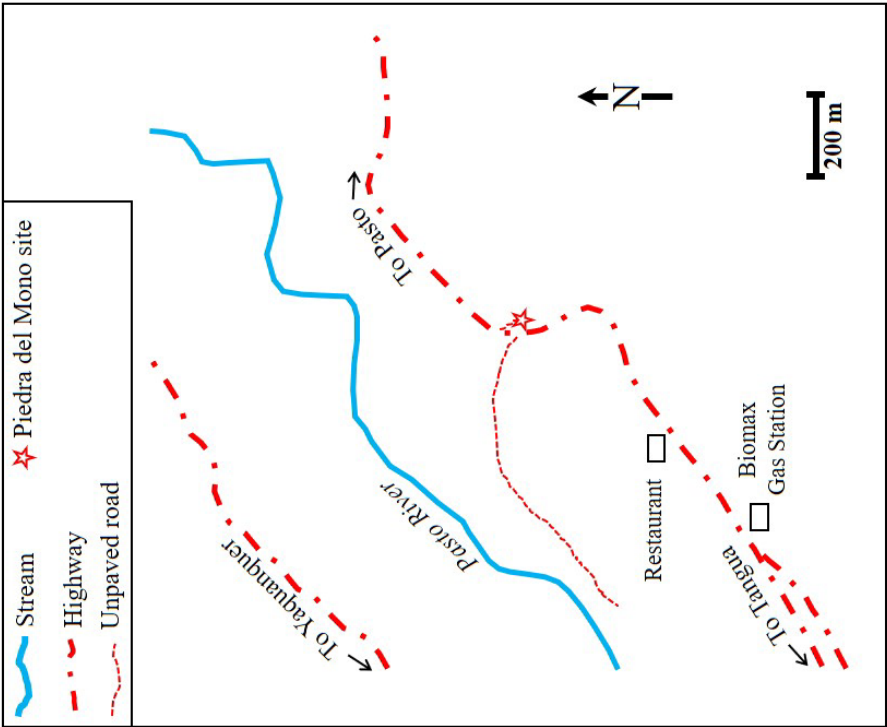
Date: D 18 M 12 Y 2021

Name: John J. Sánchez.

ROCK ART REPRESENTATION



MAP



ROCK ART REPRESENTATION

PHOTOGRAPHIC EVIDENCE



Name of site: Piedra Laja cave pictograph. **Latitude:** 1.25075. **Longitude:** -77.33905. **Elevation:** 2798 m.

Municipality: Pasto, Genoy. **Locality:** Aguapamba Alto. **Farm:** **Proprietor:**

Geoform: Alluvial fan with a hummock-like landform in direction of the apex, small cave on right margin of valley.

Conservation: Poorly preserved, vandalized.

Access: From the Aguapamba rural settlement aqueduct tank, follow a partially stone-paved path and by-path.

Time of record: 11:25 am. **Weather:** Foggy, drizzly.

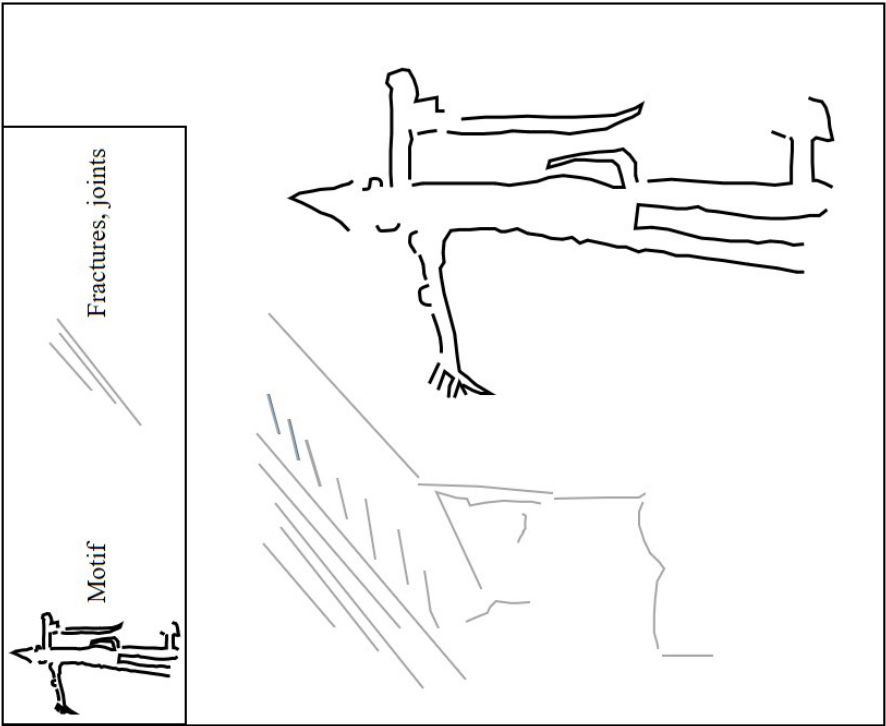
Lithology	Rock dimensions	Pictograph colors	Orientation of rock	Associated artifacts	Superposition of motifs	Depth of engraving	Rock visibility	Visualization
Andesitic lava with scoriaceous texture.	5-m-wide, 2- m-high.	Brown	NE-SW.	Possible ceramic fragments and piece of carved rock with polygonal cross section.			Visible from the <i>Mantel de Piedra</i> pastureland.	Cannot see anything beyond entrance to grotto.

Observations: Pictogram is anthropomorphic figure (T. Fierro, pers. comm.). The *Mantel de Piedra* petroglyph is located on the neighboring pastureland, though we did not see it.

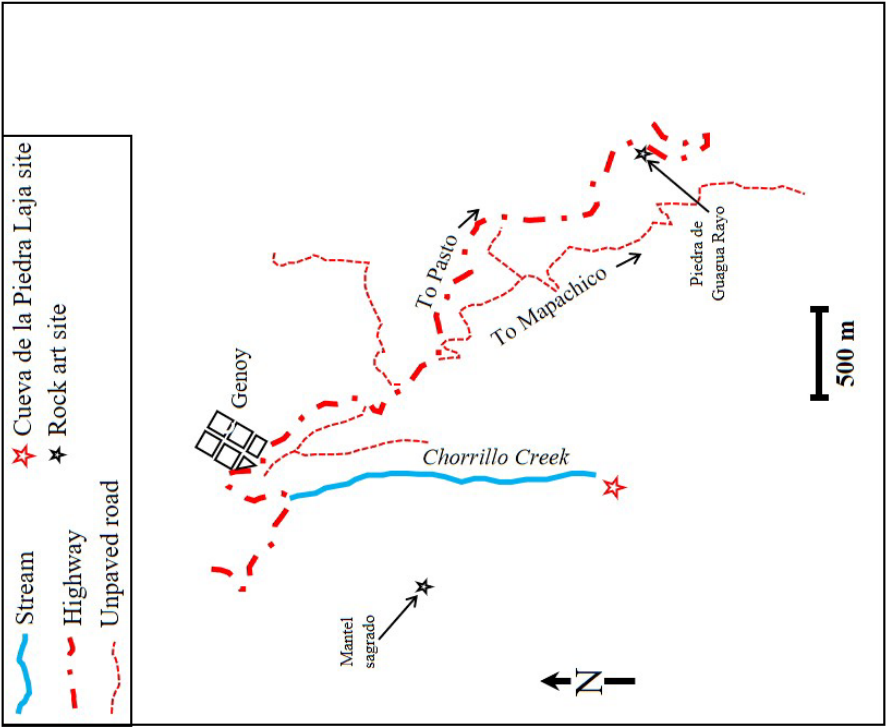
Date: D 19 M 12 Y 2021

Name: John J. Sánchez.

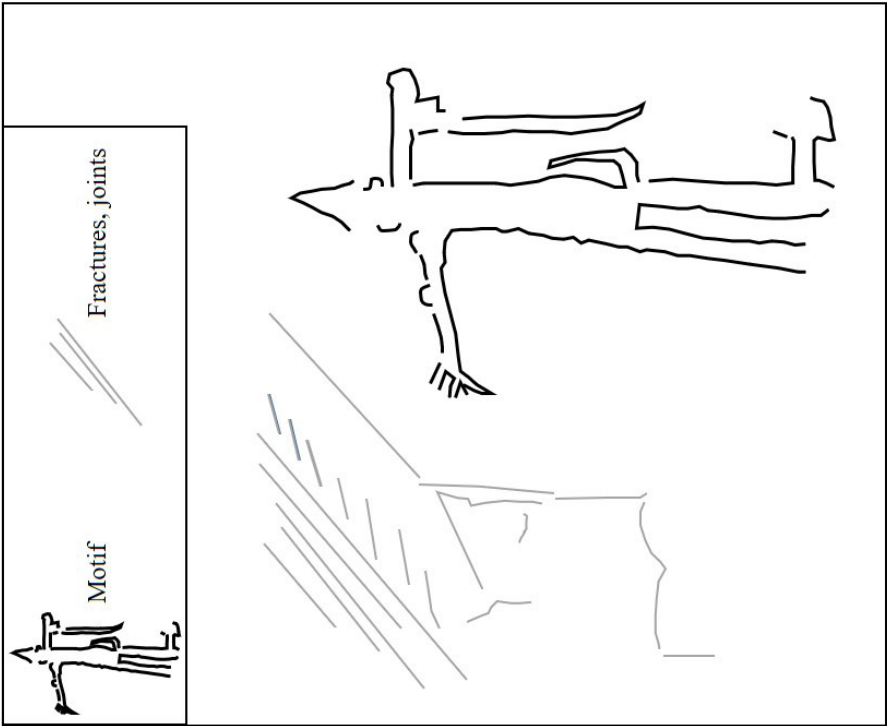
ROCK ART REPRESENTATION



MAP



ROCK ART REPRESENTATION



PHOTOGRAPHIC EVIDENCE



Summary of attributes used in field survey format to describe rock art sites in Nariño.

	Attribute	Explanation
Page 1	Name of site	Published or informal name of the rock art site.
	Latitude	Coordinate of latitude (decimal degrees).
	Longitude	Coordinate of longitude (decimal degrees).
	Elevation	Site altitude (m a.s.l.).
	Municipality	Closest main town to the site.
	Locality	Municipal rural settlement.
	Farm	Name of farm within which a site is located.
	Proprietor	Name of farm owner.
	Geomorph	General description of the local landscape.
	Conservation	Description of the preservation state of the rock art site.
	Access	Instructions to reach the site.
	Time of record	Time stamp for the visit to the site.
	Weather	Observation of local atmospheric conditions.
	Lithology	Description of type of rock, texture, composition, and structures.
	Rock dimensions	Height and width of the rock face.
	Pictograph colors	Colors used in the rock art.
	Orientation of rock	The orientation of the rock face, in quadrants format.
	Associated artifacts	Types of man-made objects found nearby.
	Superposition of motifs	Description of design overlays, if any.
	Depth of engraving	Profundity of etching markings (cm).
	Rock visibility	List of locations from where the rock art site can be seen.
	Visualization	List of locations that can be seen from the rock art site.
	Observations	Complementary information.
	Date	The date of the visit to the site (DD-MM-YYYY).
	Name	Name of person that conducted the inspection and description.
Page 2	Map	A plan-view drawing of the site and its surroundings.
	Rock art representation	A sketch of the designs on the rock face.