



Review

The Calima Mushroom Mystery: Ethnomycological possibilities among the pre-Hispanic indigenous tribes that inhabited the Valle del Cauca territories in Colombia, South America

Juan Camilo Rodríguez Martínez

Instituto Colombiano de Etnomicrología – Ave. Calle 100 # 64-51 111211, Bogotá, Colombia.
E-mail: sociedadcolombianademicologia@yahoo.com

Abstract

The ritual use of neurotropic mushrooms by pre-Hispanic indigenous cultures of Colombia has attracted increasing scholarly attention in recent years. Ethnohistorical and archaeological interpretations have proposed the ceremonial use of psychoactive fungi among several indigenous groups, including the Muisca, Tayrona, Quimbaya, Zenú, and related cultures. Parallel to this historical inquiry, modern biomedical research has demonstrated the therapeutic potential of mushrooms, particularly psilocybin-producing taxa for neuropsychiatric disorders, and medicinal species such as *Ganoderma lucidum* and *Hericium erinaceus* for cancer, metabolic disorders, and neuroprotection. These developments raise the question of whether ancient cultures recognized and utilized the medicinal and psychoactive properties of fungi. This paper explores the possible use of mushrooms by pre-Hispanic indigenous populations inhabiting the Calima Valley and surrounding regions of present-day Valle del Cauca, Colombia. Archaeological evidence indicates continuous human occupation of the region from approximately 7700 BC, with pottery traditions dating to around 1500 BC. Although formerly attributed to a single “Calima” culture, subsequent research has identified at least three distinct cultural phases: the Ilima (until ~100 AD), the Yotoco (200 BC–1300 AD), and the Sonso (from the 7th century AD through the period of Spanish contact), the latter likely corresponding to the population referred to as the Yacos in 17th century Spanish accounts. By integrating archaeological chronology with comparative ethnohistorical and ethnomycological perspectives, this study proposes that mushroom use may have formed part of the ritual and medicinal practices of these pre-Hispanic societies.

Keywords: Calima, Colombia, Entheogens, Ethnomycology, Goldsmithing, Psilocybin Mushrooms.

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1. Introduction

Ethnomycology is the science that studies the role of fungi in human cultures and their impact on these cultures throughout history. Archaeological and ethnolinguistic evidence has revealed the diverse uses of fungi by ancient humans. One of the most astonishing discoveries concerns a man who froze to death more than 5,000 years ago, 92 m south of the Austrian/Italian border (Peintner et al., 1998) (c.f., Comandini & Rinaldi, 2020). Among the belongings, three different objects related to fungi, including fungal material used as tinder and belonging to the species *Fomes fomentarius*, were found. The use of polypores to light fires is documented, and Native Americans in North America use these fungi to produce a smoke that lulls bees and allows the Indians to consume their honey (Keewaydinoquay, 1998). There is also a documented tradition of *Amanita muscaria* among these native indigenous populations, reflected in their myths and legends and portrayed in their spiritual beliefs (Keewaydinoquay, 1979). A contemporary use of *Amanita pantherina* by an indigenous tribe in California has also been documented in the last few years, and there is a possibility it can be traced from the present to the past (Buckskin & Benson, 2005).

Levi-Strauss proposed in his famous book, “Structural Anthropology”, that human societies are divided into two groups: those that are about mushrooms and those that don't (Lévi-Strauss, 1974). Inspired by the ideas of Valentina Pavlovna Wasson and R.G. Wasson (Wasson & Wasson, 1957), who classified human attitudes toward mushrooms into mycophilia and mycophobia, it is a reality. There are humans who enjoy mushrooms as food and others who reject them (Comandini & Rinaldi, 2020). All of this can be traced back to prehistoric times and behaviors that have been imprinted on our collective unconscious as a human species, and this idea can be related to religious fertility cults whose sacrament was a mushroom (Wasson, 1958).

In Colombia, this behavior is reflected in rural populations. While some rural populations have extensive traditional knowledge of mushrooms, others, on the contrary, reject them with a certain fear that could be described as almost religious and superstitious (Ruiz, 2019). In large cities, like Bogotá, the use of edible mushrooms was limited to the classic Paris button mushroom, *Agaricus bisporus*. In recent years, mushrooms such as the oyster (*Pleurotus* sp.), shiitake (*Lentinula edodes*), and Judas's ears (*Auricularia* sp.), among other edible species, including exotic truffles (*Tuber* sp.) imported from Europe, have gained much popularity in Colombia.

Regarding hallucinogenic mushrooms, their use and knowledge in the recent past were restricted to hippies and alternative urban tribes, as well as exclusive academic circles. However, this use and knowledge have now become widespread thanks to the great popularity of *Psilocybe* mushrooms in the media and on social networks. Cultivation methods have also become more popular, allowing for easier dissemination and acquisition by the general population. This has positive consequences for the medicinal uses and access to these uses, and negative consequences for harmful uses that could lead to prohibition.



Mushrooms are essential in the ecosystems of planet Earth, and their biological function in maintaining ecological balance is crucial as primary decomposers and recyclers of organic matter, converting these waste materials back into nutrients to restart the cycle of life. The study of fungi and their impact on humanity is necessary to preserve the wisdom and biodiversity that is being lost alarmingly fast in a modern world that forgets its ancestry. The use of fungi by indigenous communities in pre-Hispanic Colombia is a topic that needs to be studied rigorously. Knowledge of our past is essential for our future as a human species (Winkelman et al., 2022).

This article suggests the use of fungi for spiritual purposes in religious contexts by the tribes of Pre-Hispanic Colombia that occupied the current territory known as the Calima Valley, in the department of Valle del Cauca, in the country of Colombia, and its proximities, focusing mainly on the Yotoco culture that dwelled in that zone (Langebaek & Múnera, 1992). This article analyzes certain ceramic and goldsmithing artifacts that were produced by the pre-Hispanic indigenous tribes that inhabited the Calima Valley and its proximities, focusing on the Yotoco culture goldsmithing that suggests a possible use of mushrooms in a ceremonial context with spiritual purposes. The Malagana Culture, which was discovered in 1992 in the proximity of the Calima Valley, is also studied (Falchetti, 2018).

2. Materials and Methods

For the preparation of this article, pieces belonging to the Colombian pre-Hispanic goldsmithing era classified in the Museo del Oro located in Bogotá, Colombia, such as Calima and Malagana, were analyzed. The objects of greatest interest belong to the Yotoco culture. Artifacts belonging to the Ilama and Sonso cultures, which also inhabited the Calima Valley at different times and in different periods, were also analyzed. Certain objects from the Malagana culture, which inhabited the proximities of the Calima Valley and whose goldsmith representations bear a certain resemblance to the Yotoco culture, were also analyzed. A diverse bibliography covering various topics of study related to anthropology, archaeology, ethnobiology, and ethnomycology, among other disciplines, was also consulted for the preparation of this article, including textbooks related to the ancient pre-Hispanic populations that inhabited the Calima Valley in pre-Hispanic Colombia and their goldsmithing and ceramics.

3. Results and Discussion

Regarding a past use in Colombia, Richard Evans Schultes and Alec Bright were the first to suggest a mushroom cult in Colombia in the article "**Ancient Gold Pectorals From Colombia: Mushroom Effigies?**" (Schultes & Bright, 1979). While a few years ago the literature on this topic was scarce, over time it has increased, as has the interest of both academia and the general population in this topic. Archaeological evidence suggesting the use of mushrooms by indigenous groups who once inhabited the territories that now constitute Colombia during pre-Hispanic times is abundant. The discovery of grinding stones and other artifacts possibly used for the consumption of edible mushrooms and as sacraments is merely speculation, but also a possibility. In the myths and legends of the Uitoto people, we find a mention of mushrooms in connection with magical uses (Preuss, 1994). This legend was compiled by the German



ethnologist Konrad Theodor Preuss during his travels through Colombia. In some texts by Gerardo Reichel-Dolmatoff, also German and based in Colombia, we find records of the use of mushrooms in initiation ceremonies for spiritual leaders in the Sierra Nevada de Santa Marta (Reichel-Dolmatoff, 2006). Regarding linguistic evidence, several Colombian indigenous languages, including Uwa (Osborn, 1979) and Muisca (González de Pérez, 2017), have words to designate mushrooms, among others, like the one spoken by the Kogui in the Sierra Nevada de Santa Marta. Mushrooms are also currently used by the Wayuu indigenous ethnic group in La Guajira, Colombia, as cosmetics by women, among other uses, including one as a sunscreen to protect the skin from the sun (Villalobos et al., 2017). The Embera Chami indigenous tribe claims to have a mushroom ceremony with a pre-Hispanic origin using *Psilocybe* mushrooms that they still perform, but this has not been fully proven and has been questioned (Rodriguez & Allen, 2019).

This paper suggests the use of mushrooms for religious and spiritual purposes in ritual contexts by the tribes that inhabited the Calima Valley in pre-Hispanic Colombia.

4. A Bibliographical Overview

4.1 Iлама, Yotoco, and Sonso

Regarding the indigenous people who inhabited the Calima region and its surroundings, the evidence is rather scarce, but there are certain objects that suggest spiritual use in ritual contexts. In the book "Arte de la Tierra: Culturas del Calima", published by the Banco Popular, Fondo de la Promoción de la Cultura, in 1989 (Bray et al., 1989), we find two interesting pieces belonging to the Sonso Culture. The first is the anthropomorphic lid of an urn that suggests the shape of a mushroom but could also be a crescent-shaped headdress crowning the head (Fig. 1). The second piece of interest is an anthropomorphic representation with a suggestive mushroom shape very similar to the piece already mentioned (Fig. 2).



Fig. 1. Sonso lid of an urn. Photo: Courtesy of Fondo de Promoción de la Cultura Banco Popular.



Fig. 2. Sonso anthropomorphic representation suggesting a mushroom. Photo: Courtesy of Fondo de Promoción de la Cultura Banco Popular.

There are certain vessels and cups that were likely used to serve beverages and are decorated with geometric motifs reminiscent of stylized mushrooms. These cups and bowls have been found in archaeological remains belonging to the Yotoco culture. It is not unreasonable to suggest that these vessels were used to serve fermented beverages, psilocybin elixirs, or another psychedelic drink. Their shapes, reminiscent of a mushroom pileus, are also something to consider. Among the Muisca, the totuma (the vessel in which their fermented sacred drink Fapqua is served) symbolizes the celestial vault; its form is very similar to the

Yotoco vessels. Further research is needed on this particular subject. In the book just cited we find some examples that are reproduced below. (Bray et al., 1989) (Figs. 3 & 4).



Fig. 3. Yotoco bowl with geometric figures suggesting stylized mushrooms. Photo: Courtesy of Fondo de Promoción de la Cultura Banco Popular.

Fig. 4. Yotoco cup with geometric figures suggesting stylized mushrooms. Photo: Courtesy of Fondo de Promoción de la Cultura Banco Popular.

In the book "El Oro y las Culturas Precolombianas", published in 1992 by Carl Heinrik Langebaek (Langebaek & Múnera, 1992), we find a beautiful piece from the ancient goldsmithing of the Yotoco culture (Fig. 5). It is the end of a poporo stick. The poporo is a container where lime is kept. The indigenous people used lime in the mambeo ritual, where coca leaves are chewed (Fig. 6.).



Fig. 5. End of a Yotoco Poporo Stick with mushroom-suggestive details. Photo: Courtesy of Carl Langebaek.

Fig. 6. Yotoco Golden Poporo. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

When lime is mixed with the coca leaves, the properties of the coca leaf are more intense and better utilized. The details are meticulous. The ornamentation reminiscent of mushrooms is evident, and one could almost certainly suggest that what the figure is holding in one of its hands is also a mushroom. The form of his head is shaped in the form of a mushroom pileus, and the details that sprout from it are also very fungal. They are reminiscent of the stylization of mushrooms, a product of artistic evolution, a hypothesis proposed by Wasson regarding Mesoamerican art and its representations of mushrooms (Wasson, 1983).

Looking through the Calima collection catalogue available online from Banco de la República, this wonderful gold pendant from the Yotoco culture is featured. It represents a fantastical creature with two mushrooms sprouting from its head that resemble the genus *Psilocybe*. (Figs. 7 and 8).



Fig. 7. Yotoco Gold Pendant. Courtesy of Museo del Oro, Banco de la República

Fig. 8. Yotoco Gold Pendant. Photo: Courtesy of Museo del Oro, Banco de la República.

Regarding the Iлама culture, the pieces exhibited in the available bibliography on the subject that has been consulted do not suggest any form of mushrooms, but further research should be carried out.

5. The Malagana Case

In 1992, in the municipality of Palmira in Valle del Cauca, in Colombia, an astonishing discovery was made by pure accident. At the Hacienda Malagana, a pre-Hispanic settlement lay buried beneath sugarcane crops (Banco de la República, 1994). Unfortunately, the surprising archaeological find fell victim to looting by *guaqueros* (grave robbers) and raiders who took advantage of the opportunity to sell many of these pieces illegally. The efforts of the Museo del Oro led to the recovery of some of these artifacts and the completion of archaeological studies, but unfortunately, the looting activities altered the area and have posed difficulties for studies conducted in the region. Despite certain artistic connections in some of the ceramic pieces found in the Hacienda Malagana with other pre-Hispanic indigenous cultures that inhabited the Calima Valley like the Iлама and the Yotoco, it was determined that the culture today known as the Malagana Culture represented a unique culture in its own right.

In the article “Micolatría en la Iconografía Prehispánica de América del Sur,” published by the Colombian researchers Cesar Augusto Velandia Jagua, Leidy Galindo, and Katherine Mateus, a Malagana trumpet is shown, and the authors suggest it depicts some artistic motives that represent mushrooms (Velandia et al., 2008) (Figs. 9–11). Also in my article with John W. Allen, a personal communication with Carl de Borhegyi is noted in which the researcher sent me a photograph in which a Malagana mask is depicted with forms of mushrooms sprouting



from its head. They remind the genus *Gymnopilus* that contains psilocybin-producing fungi. The shape of its eyes also is reminiscent of the appearance of eyes with dilated pupils of a person under the effects of psilocybin (Figs. 12–14). Both pieces are displayed in the Museo del Oro in Bogotá, Colombia.



Fig. 9. Malagana trumpet showing motifs that resemble stylized mushrooms. Photo Courtesy of Cesar Velandia, Leidy Galindo, and Katherine Matheus.

Fig. 10. Malagana trumpet in Museo del Oro de Bogotá. Showing motives that resemble stylized mushrooms. Photo: Courtesy of Juan Camilo Rodríguez Martínez.



Fig. 11. Malagana trumpet in detail showing the stylized mushroom patterns suggested by Velandia, Galindo, and Matheus. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

Fig. 12. Golden Malagana mask that shows figures similar to mushrooms sprouting all over the head. Photo: Courtesy Carl de Borhegyi.



Fig. 13. Golden Malagana mask that shows figures similar to mushrooms sprouting all over the head. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

Fig. 14. Details of the mushroom forms on the Malagana Golden mask. They resemble mushrooms belonging to the genus *Gymnopilus*. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

6. A Visit to the Museo del Oro in Bogotá, Colombia

After the analysis of the available literature and of the goldsmithing and ceramic pieces displayed in that literature, we proceeded to visit the Museo del Oro in Bogotá, Colombia, in search of clues in other objects displayed in the collection that might give indications of the use of mushrooms in the Colombian pre-Hispanic past, in addition to carrying out an analysis and taking photographs of the objects already mentioned in the previous chapter and which are already exposed.

6.1 Ilima

6.1.1 The Colombian Xotchipili

A striking piece from the Ilima culture is this artistic representation of a man with animal-like characteristics that give him a certain fantastical appearance. He seems immersed in a psychedelic trance resulting from the ingestion of plants. And why not psychedelic mushrooms? (Fig. 15).



Fig. 15. The Colombian Xotchipili. Photo: Courtesy of Juan Camilo Rodríguez.

Fig. 16. Xotchipili. Photo: Courtesy of Museo Nacional de Antropología de México. Retrieved from Wikipedia

The position of this being and its details are reminiscent of the statue of Xotchipilli exhibited in the Museo Nacional de Antropología in Mexico City, which Wasson linked to hallucinogenic mushrooms due to the stylized geometrics depicted on certain parts of its body, along with other shapes that the famous researcher suggests are representations of other entheogens that were used in Ancient Mexico (Wasson, 1983) (Fig. 16.).

It would be very daring to suggest that, as a result of a migration from the North to the territories of pre-Hispanic Colombia, a cult of mushrooms and Xotchipili would have spread from ancient Mexico and its surroundings to the south of the American continent, but the suggestion is interesting.

6.2 Yotoco

The objects exhibited at the Museo del Oro in Bogotá, Colombia, that are most suggestive of a possible use of mushrooms for spiritual purposes in religious contexts in the ancient Calima Valley in pre-Hispanic Colombia belong to the culture cataloged as Yotoco.

6.2.1 A Yotoco Poporo Stick

Examining the Poporo sticks on display in the collection, one stands out. The piece is very interesting. The details are meticulous, and the top of the stick, which represents a man holding what could be a maraca, or, why not, a mushroom, is very small. Unfortunately, the protective



glass and the size of the piece make it difficult to take a more detailed photograph. (Figs. 17 and 18)'



Fig 17. Yotoco Poporo Stick. Photo: Courtesy of Juan Camilo Rodríguez Martínez

Fig. 18. Details of the top of the Yotoco Poporo Stick showing what appears to be a person wearing a mask holding a mushroom in its hand. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

6.2.3 The Yotoco Mushroom Crowns

The most impressive pieces on display in the museum that could provide a very suggestive clue about the use of mushrooms by the pre-Hispanic indigenous tribes studied in this paper are the crowns that were worn by the Yotoco shamans on their heads. Possibly they were used in their spiritual rituals where they ingested psychedelic mushrooms to achieve ecstasy. From the crowns, a semblance of a mushroom with humanoid features appears to be emerging. This detail could be a representation of the mushroom spirit, and the array of ornamentation on the goldsmithing pieces suggests the shaman's flight to the astral planes, where communication with the deities is done and a transformation into a fantastic flying being or an animal from nature, like a bird or a bat is possible. (Figs. 19–22.)



Fig 19. Yotoco Mushroom Crown. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

Fig. 20. Details of the Yotoco Mushroom Crown. A mushroom-shaped figure can be seen sprouting from its head. Photo: Courtesy of Juan Camilo Rodríguez Martínez.



Fig. 21. Yotoco Mushroom Crown. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

Fig. 22. Details of the Yotoco Mushroom Crown. A mushroom-shaped figure can be seen sprouting from its head. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

7. Sonso

Regarding the Sonso culture, there is no evidence in the Museo del Oro suggesting mushroom usage in the past.

8. Some psilocybin-producing mushrooms documented in the Valle del Cauca in Colombia

8.1 Genus *Gymnopilus*



Fig. 23. *Gymnopilus aeruginosus* found in the Valle del Cauca near Cali. Photo: Courtesy of Hans W. Dahners.

Fig. 24. *Gymnopilus luteofolius* group found in the Valle del Cauca near Cali. Photo: Courtesy of Hans W. Dahners.

8.2 Genera *Panaeolus* and *Psilocybe*



Fig. 25. *Panaeolus cyanescens* found in Valle del Cauca near Cali. This species is suspected to be introduced in Colombia after the Spanish Conquest. Photo: Courtesy of Hans W. Dahners.

Fig. 26. *Psilocybe cubensis* found in Valle del Cauca near Cali. This species is suspected to be introduced to Colombia after the Spanish Conquest. Photo: Courtesy of Hans W. Dahners.



Fig. 27. *Psilocybe hoogshagenii* found in Valle del Cauca near Cali. Photo: Courtesy of Hans W. Dahners



Fig. 28. *Psilocybe yungensis* found in the Valle del Cauca near Cali. Photo: Courtesy of Hans W. Dahners.



Fig. 29. *Psilocybe sect. zapotecorum* was found in the Valle del Cauca near Cali. Photo: Courtesy of Hans W. Dahnert.

9. Discussion

In ethnomycology, it is common to attempt to identify mushrooms in all available archaeological evidence, but mistakes cannot be ruled out. Many of the artistic representations produced by ancient masters could be headdresses adorning the heads on which they are found. It is also possible to mistake a maraca (a musical instrument) for a mushroom on a poporo stick. The possibility that they are mushrooms cannot be ruled out. But without a doubt, much of the available archaeological evidence is suggestive enough to categorize it as a representation of mushrooms in pre-Hispanic indigenous art (Fig. 30).

The discovery of metates and grinding stones in excavated sites in the Calima area and its surroundings supports the suggestion that the tribes that inhabited this area in pre-Hispanic times used mushrooms in their rituals and as food sources. Unfortunately, the European Conquest and its colonization processes failed to take into account the indigenous cultures they subjugated and exterminated, destroying their legacies and knowledge. Of many of them, all that remains is their ceramics and goldsmithing, a silent witness to their artistic expressions, giving us a glimpse of what their cosmogony and spirituality may have been like. All of this can be related to our knowledge of the indigenous cultures that still exist and live in Colombia. And this can give us some idea of what their ancestral past may have been like (Fig. 31).

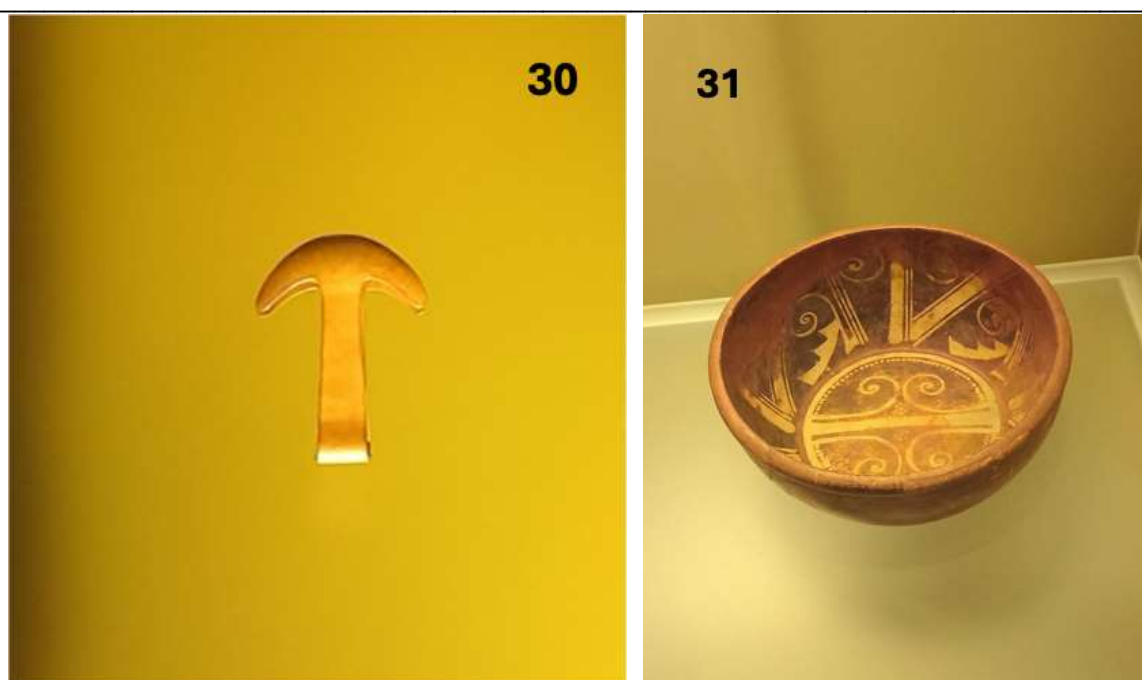


Fig.30. Yotoco Golden Pendant in the shape of a mushroom. Photo: Courtesy of Juan Camilo Rodríguez Martínez.

Fig. 31. Yotoco vessel with geometric patterns suggesting stylized fungi. Photo: Courtesy of Juan Camilo Rodríguez Martínez

As for biological evidence, there is no doubt that psilocybin-producing species native to America were available to the indigenous tribes that inhabited the Calima Valley and its surroundings before the arrival of the Spanish in pre-Hispanic times.

10. Conclusion

The available archaeological evidence suggests the use of mushrooms by the indigenous people who inhabited pre-Hispanic Colombia. This, when compared with the ethnolinguistic evidence present in the languages, myths, and legends of indigenous tribes still inhabiting Colombia, makes the use of mushrooms in spiritual contexts for ritual purposes in pre-Hispanic Colombia very possible. In this case, the indigenous tribes that lived in the Calima Valley and its proximities, all available evidence makes them possible candidates for holders of fungal knowledge in the ancient Colombian past. Further research is needed to explore such ancient knowledge.

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Conflict of Interest

There is no conflict of interest.

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