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ORIGINAL ARTICLE

# *Experiences With Sacred Mushrooms and Psilocybin In Dialogue: Transdisciplinary Interpretations Of The “Velada”*

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ANTONELLA FAGETTI 

*Instituto de Ciencias Sociales y Humanidades,  
Benemérita Universidad Autónoma de Puebla  
antonellafagetti@yahoo.com.mx*

ROBERTO E. MERCADILLO

*Universidad Autónoma Metropolitana-Unidad  
Iztapalapa  
Consejo Nacional de Ciencia de Tecnología  
emmanuele.mercadillo@gmail.com  
remercadilloca@conacyt.mx*

## ABSTRACT

*We present the set and setting of the velada, the Mazatec ritual of divination and healing. We highlight the subjective experiences of individuals who consumed sacred mushrooms and interpret them from their cultural and community contexts, but also from findings derived from experimental and neuroscientific research. We understand that the experiences connected to sacred mushrooms can be explained by the effects of psilocybin on the neurobiology of emotions, decision making, and visual, auditory, and bodily imagery. But we also understand that experimentation does not consider the individual and collective history of the person, and that the velada can provide guidance for integrating a person’s history and beliefs into experimental designs. The resurgence of psychedelic medicine prompts us into a transdisciplinary dialogue that encompasses both the anthropological*

*perspective and the set and setting of the entheogenic experience during the sacred mushroom ritual.*

KEYWORDS: Sacred mushrooms, psilocybin, Mazatec ritual, experience, transdisciplinary



The so-called resurgence of psychedelic medicine in the twenty-first century has led various scientific disciplines that study behavior and cognition to focus on the effects of psilocybin and its benefits in certain therapeutic contexts. This initiative has been supported by increased political and regulatory flexibility for scientists to access psilocybin, along with the adoption of phenomenological experimental approaches, the development of psychometric instruments to assess experiences and, above all, the sophistication to record human brain function in a non-invasive way through functional magnetic resonance imaging.

As new horizons open up in psilocybin research, we aim to present a cross-sectional analysis that considers the set and setting of entheogenic experiences with sacred mushrooms, collected through ethnographic records obtained in the mountainous area of the Sierra Mazateca, in Oaxaca, Mexico, as well as to understand, contrast, and discuss these experiences with knowledge acquired in the therapeutic and experimental fields regarding psilocybin and its effects, as reported in the scientific literature.

The convergence points for our analysis consider two aspects of subjective experiences in contemporary psychedelic therapy and the context of indigenous rituals: set and setting. Set comprises the attitudes, moods, feelings, emotions, and thoughts of the user of a psychoactive substance, whereas setting refers to the physical and social scenarios or environments that contextualize the experience stemming from the use of the substance (Pollan 2020, 195).

Sacred mushrooms were "discovered" for scientific purposes in the first half of the twentieth century, when the secrecy of the Mazatec people's ritual use of *ndi xi tjo*, the "little ones that sprout," was broken. Interest in elucidating the enigma of the sacred mushrooms emerged in the 1920s, when it was demonstrated through the work of Blas Pablo Reko, that the *teonanácatl*—described by Fray Bernardino de Sahagun in the sixteenth century—belonged to the fungi kingdom. From then on, anthropological and ethnobotanical research has been carried out on the so-called "magic" and "hallucinogenic" mushrooms, which have been classified into different psilocybe species.

In 1938, Roberto Weitlaner, his daughter Irmgard, and his son-in-law Jean B. Johnson, were the first foreigners to witness a *velada*, or sacred mushroom

ritual, but it was not until 1957, when Life magazine published Gordon Wasson's famous essay, "Seeking the Magic Mushroom," that the world learned about María Sabina, a wise woman in the distant mountains of the Sierra Mazateca, in Mexico, who knew the secret of the *Niños Santos* (Holy Children) and would cure her people with them. In 1974, G. Wasson and collaborators revealed the mystery of the sacred mushrooms in their book *María Sabina and her Mazatec Mushroom velada*, which contained photographs, music, and texts in Mazatec, Spanish, and English of the chants recorded during a mushroom ritual held on June 12 and 13, 1958.

To this day, mushrooms continue to be the object of study. Initially, scientists went in search of *teonanácatl* ("flesh of the gods") out of curiosity to demonstrate the preservation of ancient Mesoamerican rituals documented in colonial historical sources. Traces were found not only among the Mazatec, but also among the Cuicatec, Mixe, and Zapotec peoples. (Hoogshagen 1994; Miller 1994; Schultes 1940; Wasson 1983). Several ethnobotanists, among them Schultes, Heim, and Guzman, undertook the task of collecting, identifying, and naming the mushrooms, while Albert Hofmann, in Switzerland, identified their active compounds: psilocin and psilocybin (Díaz 2010).

According to Julio Glockner (2016, 198), "When Gordon Wasson ate the mushrooms, the possibility of peering into indigenous spirituality was explored for the first time." Moreover, witnessing the effects of the Holy Children in the *velada* also showed to the western world that they derived from substances operating in the brain chemistry. This was the great discovery that created new possibilities for scientific research during the second half of the twentieth century, particularly for the behavioral sciences, neurosciences, and for psychiatric medicine. Part of this research was conducted during the 1960s and 1970s using basic animal models with a comparative approach between the psychotomimetic or hallucinogenic substances, as they were known at the time, which included psilocybin with mescaline and lysergic acid diethylamide (LSD) (Kakolewski 1968; Roberts and Barley 1967; Scholes and Gutnick 1970). It was not until the 1990s, with the sophistication of psychophysical designs and the development of neuroimaging, that neuroscientific research was conducted on humans (Spitzer et al. 1996; Vollenweider et al. 1994).

The epistemological distance between the western and Mazatec context, which the wise María Sabina was able to express to her biographer, Alvaro Estrada, at the end of the 1970s, is still a matter of concern. It is a reflection arising from her meeting with Gordon Wasson and the consequences of the worldwide dissemination of his findings: that the mushrooms were appreciated as a source of recreational and spiritual experiences by young visitors to Huautla de Jimenez, Oaxaca (Estrada 1966; García 2014; Rodríguez 2017). It had always surprised the wise woman that the reason people came to her

house was to "encounter God," whereas she and the members of her community had always used "*los pequeños que brotan*" ("the little ones that sprout") when someone was gravely ill or as an oracle for people seeking answers and guidance. Traditionally, the Holy Children have been treated as a divine entity in the ritual of the vigil (*velada*), which takes place in the privacy of the home, guided by the ritual specialist known as *chjota chjine* ("wise person"), with a clear purpose and under strict rules that are observed to this day.

For decades, anthropologists have studied the Mazatec *velada*, but thorough research on certain aspects or contents of the ritual are still necessary. For example, the role of the ritual specialist; the motives that induce the Mazatec to ingest the mushrooms; the phenomenology of their experiences; the background that sustains and recreates the visual and auditory perceptions deeply anchored in the Mazatec worldview, where Catholic divinities, the *Chikon* ("Owners"), and the dead all play a part; the scenarios that also reflect the contradictions and conflicts between humans and non-humans, and among the Mazatec people themselves: the origin of illnesses and misfortunes that plague the sierra and require the intervention of a sage for their resolution.

We believe that clinical trials and experimental research with psilocybin can find valuable elements in anthropological studies for rethinking research protocols and the interpretation of findings. In this sense, we consider that fostering a dialogue between anthropology, neurosciences, and psychology is needed in order to encourage a gradual transition towards a transdisciplinary approach in research. This approach assumes the complexity of contexts, takes into account the interactions between the natural and social systems they comprise, and understands such interactions from the collaboration and exchange of knowledge between researchers and other parties interested in the phenomenon. Transdisciplinarity also involves integrating knowledge from different disciplines, as well as the reflections that researchers make on how their frameworks or assumptions shape the concepts and understanding of the problem (Wickson, Carew, and Russell 2006). Thus, transdisciplinarity is a first step in an exercise that, based on the entheogenic experience of the Mazatec people, may result in a better understanding of the effects of psilocybin and what it represents for therapeutics in the western context.



## METHOD

### *Ethnographic data collection*

First-hand data were collected in Oaxaca, Mexico, in different localities of the municipalities of Santa María Chilchotla (from 2007 to date) and San Jose Tenango (December 2020; June and July 2021). By observing three

veladas and conducting semi-structured interviews, we obtained general information and testimonies from ritual specialists and people who ingested psilocybin mushrooms mainly for therapeutic reasons.

### *Scientific literature review*

We conducted an online search for publications registered in the ScienDirect, PubMed, ProQuest, LILACS, and Redalyc databases. These publications had to have the word "psilocybin" or "psilocibina" in their title and/or abstract. The first search yielded 9643 results; publications that were repeated or did not show psilocybin as the main research substance were discarded. A total of 338 publications were selected and categorized as relating to the following: health-disease processes and therapeutic models (n = 88); behavior, cognition and experiences (n = 61); effects on the nervous system (n = 46); transdisciplinarity (n = 53). After reading these texts, we selected the material published between 2000 and 2020 and chose 23 publications that we considered representative for our analysis and that address three main topics: emotional, sensory, and mystical experiences after psilocybin use (n = 10); clinical trials or therapeutic models (n = 10); research on brain function recorded by functional magnetic resonance imaging (n = 3).

### *Analysis*

A phenomenological analysis was conducted for ethnographic observations and first-person accounts (Díaz 2020) to show the significance of the experience of individuals who had an entheogenic trance in a complex scenario—characterized by the interaction between the guide and therapist, the "patient," and other attendees who become active participants in the ritual when ingesting mushrooms.

Four topics of interest stemmed from this analysis and are further explained in the Results section: elements and concepts that make up the velada; mushroom ingestion and pre- and post-ingestion diet; set and setting of the velada; representation of "el Honguito" (the Little Mushroom).

From reading the observations and testimonies of those who identified as *chjotā chjine* ("wise person"), *chjotā be'enda* ("person who fixes"), *chjotā bisén-kjao*, ("person who helps"), *chjotā chjine xi majinle* ("wise person who guides"), and *chjine én* ("person who knows the word"), and of their patients, we found certain recurring patterns in the ritual experiences. Thus, in the Results section we included cases and patient testimonies showing how the first step is to uncover the cause of the affliction and the second is to heal the afflicted person.

The contexts, experiences, and testimonies described in the results were subsequently contrasted with the methodologies and findings presented in the publications selected through a review of the scientific literature. This

contrast is presented in the Discussion section and refers to the transdisciplinary analysis of set and setting pertaining to the aim of our work.



## RESULTS

### *The velada: tsakjena kón ka'oña (staying awake together)*

The dynamics of the velada are known thanks to several anthropologists who witnessed the nocturnal ritual or documented testimonies from the Mazatec people between the 1930s and 1970s (Johnson 1939; Wasson 1983; Hoogshagen 1994; Miller 1994; Lipp 1997; Villanueva 2007; Brissac 2008; Minero 2012). The basic elements of this nocturnal ritual are preserved to the present day, despite economic, social, and cultural changes in the Mazatec region. These elements are the same as those described by María Sabina in her conversations with Alvaro Estrada (1986), which gave life to the book *Vida de María Sabina la sabia de los hongos*, published in 1977. In fact, the Honguito, a term that denotes the deference with which the mushroom is treated and the personality it is endowed, has not lost its "force" (*ng'anío*), contrary to what the famous *chjōn chjīnē* ("wise woman") predicted. Overwhelmed by various events that took place after the arrival of Wasson and his colleagues—"strange beings" whom she had previously "seen" in a ceremony with the sacred mushrooms—María Sabina confided to her biographer that the Holy Children would no longer have the same power, they would no longer serve because they had lost their purity. She herself felt that they no longer "elevated" her as before and that nothing could be done about it (Estrada 1986, 118-121).

Despite María Sabina's prediction, the Holy Children are still protagonists of the velada. To this day, the ritual saves lives and lights the way for those who feel lost, and continues to guide and teach the craft to future diviners and healers. The velada constitutes a sacred ceremony in which the *chjōtā chjīnē* (wise person), the patient, and some family members celebrate communion with God by ingesting the mushrooms, *xi tjōo nangi* (those that sprout from the earth). That is why for some people, the velada is a *mixa* (mass) where the body of Christ is eaten.

The force of the Honguito is manifested in its ability to bring about communication with the sacred powers and to make those who have communed with it speak. Its origin is attributed to the blood that Jesus Christ shed on the cross and in the places he traveled to flee persecution. Where his blood and saliva fell, various types of mushrooms sprouted: "*derrumbes*" (*ngi xoo*), which are born in the earth; San Isidro, which are found both in the bagasse of sugarcane and in manure; and *pajaritos* (*tjainlē nisé*), which grow on the trunks of rotting trees.

Generally, a person resorts to mushrooms when other types of procedures, such as candle burning, energy cleansing, or payment to a *Chikon* (i.e., the Owner of a place, mountain, cave, river, or spring) that has trapped the spirit of the person, have not been successful. In such cases, the *chjot̄a chjine* advises the sick or afflicted person to uncover the origin of their affliction, to "see with their own eyes" who or what is the cause, and proposes *tsakjena kón ka'oña* ("staying awake" or "staying awake together"). "Seeing" for oneself also prevents unscrupulous or greedy *chjot̄a chjine* from using the mushrooms and revealing false truths.

The ritual ingestion of an entheogen, such as the Honguito, which fulfills the purpose of "generating god within oneself" (Ruck et al. 1985), is *nión xkón*, a Mazatec term for "delicate," "of care," "of respect," and therefore "sacred." Planning a *velada* should be kept secret to prevent the enemy (i.e., the sorcerer, or *tje'e*, and his client), responsible for inflicting evil on a person, from finding out.

#### *Diet and ingestion*

Communion with the blood of Christ implies, above all, keeping the body clean. Some *chjot̄a chjine* recommend avoiding certain foods, such as black beans and pork, four days before the ceremony. However, post-ingestion restrictions are mandatory. Those who use sacred mushrooms for the first time must make certain sacrifices for 53<sup>1</sup> days, such as abstaining from sexual intercourse, watching one's words, and not mocking the ritual. Moreover, within the first four days of the ritual, the person cannot share or receive any food or drink; only family members living in the same house are allowed to share, on the understanding that they are all obligated to "take care of each other." According to a *chjoon chjine*, mushroom ingestion and the healing process leave a person weak, and the first four days are crucial because the Honguito "is searching for the affliction: 'I am inside your body for four days,' it tells you."

The impurity of sexual relations "soils" the work of the Honguito, thus ruining it. Likewise, an afflicted person who does not follow the "diet" runs the risk of "going mad" in the following *velada* as a punishment for their transgression. Because she understood the importance of keeping the body clean (*xqo*) and pure (*tse'e*), María Sabina stepped freely into her vocation, that of being a "woman healer," only after she was widowed for the second time.

The specialist gives to the patient, and eventually to a relative who accompanies them, the amount of mushrooms necessary for the "force" of the Honguito to reveal what they should "see" and make them talk, taking into account their build and health, but also the intensity of the desired effect. A weak person is given only one pair, or none at all, which also happens when



someone is afraid of mushrooms. Some *chjine* do not need more than one or two pairs and claim that this amount "reinforces" what they already have in their body from having consumed mushrooms throughout their life.

Another rule is that mushrooms are counted in pairs; otherwise, the mushroom will look for its companion during the ceremony. It is said that each pair is made up of a man and a woman, Jesus and the Virgin Mary: the masculine/feminine duality. Likewise, when the mushroom is not eaten whole, in the *velada* it will send for the part that was discarded. The patient's family gathers the mushrooms, which, preferably, should be fresh. Dried mushrooms have less "force" and sometimes "do not work well." Their effectiveness also depends on the care taken by the collectors, since some also observe four days of diet before and after collection. It is known that no one can see the mushrooms until they are in the hands of the persons who will distribute them, as it is believed that the gaze of a stranger contaminates the mushrooms and debilitates their effect.

The number of pairs is also determined by the type and strength of each one. The *derrumbe* type is the strongest, followed by San Isidro and *pajaritos*. At the beginning of the ceremony, the *chjota chjine* sits at a table and hands out the pairs of mushrooms on sheets or pieces of brown paper. Taking into account their size, the wise person hands out between two and eight pairs, or up to twenty when it comes to the *pajaritos*. Mushrooms are ingested with a few sips of water, and some *chjota chjine* offer a drink prepared with thirteen grains of ground cacao diluted in water.

### *Set and setting*

The copal<sup>2</sup> that burns in the censer gives off an acrid smell. The smoke purifies both the mushrooms and the people who are part of the ritual. In the *velada*, there is another essential component: San Pedro, tobacco ground with lime and garlic, which is used to trace a cross on the forearms and nape of the neck of each participant. San Pedro tobacco is hot because "it is fire"; it contrasts with the coldness of the mushrooms that are born from the earth and protects from malice: "tobacco must be used so that all three work: tobacco, God, and the Honguito."

Nighttime is the perfect setting for the ritual. Daytime life is noisy and active, whereas darkness and calm allow for introspection. If a dog barks or a rooster crows, the Honguito "gets scared and leaves," "makes you see everything black," but returns as soon as everything becomes quiet. Nothing should interrupt the ritual, because for the Honguito to speak there must be silence and, above all, total darkness. Light is a distraction that inhibits the vision brought on by the sacred mushroom. The eyes, even when open, cannot see. Instead, the patients perceive images as if they were watching a film, except they are both the spectators and the actors.

It is known that the *chjotā chjine* requires deep concentration to take care of everyone, to be aware of every word, every sound, every vision that is presented. The wise person is a true guide who knows when to intervene; for example, to lessen the force of the Honguito when patients go down the wrong path during the ceremony, which puts them in danger. In addition to being "the one who knows," the *chjotā chjine* is also "the one who guides," *chjotā chjine xi majinle*.

At the beginning of the ritual, the patients ask the Honguito, God, to reveal what they wish to know, to "enlighten them." This is why some sages refer to the ritual ceremony with the word *suerte* ("luck") because it is the luck of the people present—and often of those absent, too—that is revealed that night. Thus, the purpose of the *velada* is to hear and see what the Honguito wishes to show, teach, and communicate regarding the question that is asked. The most important part is always letting the participants speak: the *chjotā chjine*, the patient, and eventually the persons accompanying the patient. As a wise man used to say, "I speak to the Mushrooms, or the Mushrooms speak to me; that is why I know everything about a person who is afflicted and how they will be cured." It is a common feeling: "The one who guides is aware of everything: everything that happens, how it came to be, how the person is, who it was, all that. We have that authority with the Holy Spirit to remove the evil spiritually; with the hand that is already consecrated, with the word of the guide, with the word of the Lord it is removed." Guides have the gift of the word, which is why they are called *chjine én*, "the one who knows the word."

#### *The Honguito: the blood of Christ*

In the Mazatec collective imaginary, Jesus Christ, God the Father, the Virgin Mary and several saints, such as Saint Jude the Apostle, Saint Michael, and Saint Martin de Porres, are always present in prayers and *veladas*. The nameless, or *ndi xi tjo* ("the little things"), became the blood of Christ when missionaries arrived in Oaxaca and learned of the meaning that the Mazatec people (*Chjotā én nima*) gave to the Honguito. Slowly, the Honguito evolved into the Christian God. Yet, despite this overlap between the sacred Honguito and God/Christ, the former has not lost its identity. The Honguito (or the Holy Children, the Saint, "the little ones that sprout," "the little things") has its own personality when it is emphasized that *He* is the one who speaks and makes speak. He is the main actor in "the luck," the guide, the one who "enlightens," the one who shows, the one who teaches, the one who speaks to you and tells you the truth. The Honguito also judges, reprimands, and punishes during the *velada* those who by their actions and behavior contravene social norms. "The Honguito is wisdom," as one *chjotā chjine* would say, which is why his words are received as just and true.

The Mazatec worldview underlies the visions that emerge in the setting of the velada. In this worldview, the Mazatec people created an invisible "reality" where the Owners and Guardians of the sierra reside, in its springs and rivers, hills and mountains, caves and pits. The *Chikon* are the owners of the land, of the water that flows and falls from the sky, of trees and animals, among other sources of sustenance. They punish exploiters, those who contaminate the water, cut down trees without permission, hunt excessively, or bother them when passing through their land. This facet functions as a way to maintain ecological balance, preventing the overexploitation of goods that the world (*sondé*) provides and preserving reciprocal relationships between the sacred powers and the people of the sierra in order to safeguard the cosmic order.

In their role as demiurges, the *Chikon* punish offenders; they cause all kinds of accidents and trap the spirit of those who do not respect the rules of coexistence. When a person's spirit is imprisoned, they become gravely ill. This is one of the afflictions that the Honguito reveals and treats in the velada. But the majority of people with afflictions that attend a velada have been the target of a sorcerer acting on his own or by orders of another person. According to the Mazatec and indigenous peoples in general, whoever masters the magical arts has the power to inflict harm on his victim. Evil spells are the product of envy and the desire for revenge, which is satisfied by seeing another person suffer. This is how disputes and offenses are settled among close relatives and neighbors. Most of the people who gave us their testimony resorted to mushrooms to get rid of an evil spell. The Honguito helps everyone and gives them instructions on how to rid themselves of evil, but it is known that the *tje'e*, the sorcerer, also works through the Honguito to do harm.



#### CASES AND PATIENT TESTIMONIES

##### *Gudelia*

She had a big scare the day a man came into her house to complain that she was acting like "she was her own boss" and with a "knife" cut the shawl across her chest. Soon after, she began to swell. She resorted to the Honguito, as her grandparents used to do. That night she saw her body laid out, as if it were a cloth, with her heart, womb, and intestines exposed: "suddenly God does this with his sleeve [she lifts her arm]; when I noticed, I was in one piece." God advised her to return to her household chores the next day.

##### *Margarita*

Margarita, the daughter of a *chjoon chjine*, resorted to mushrooms to cure a cough that made it hard for her to breathe. That night she learned that a

fellow volunteer at the health clinic had inflicted the ailment on her. She began to vomit when the Virgin Mary rubbed her back, until the Virgin herself told her to breathe: "Now that you are cured, cure the one who is sick." She was referring to a boy that her mother was attending to in another room: "Take all the air out of him and rub his head to make his brain all better." The Virgin showed her how to do it: "I could see what he has, I'm feeling him; I'm taking the air out of him, just like my mother does: from a distance. Then they told me that his whole vein is blocked and I start rubbing and rubbing. It tells you how you're going to do it, it teaches you, it's like a teacher."

While she was "rubbing" him, the boy also vomited; everything was happening in two different rooms, because the Honguito "takes effect all the way over there." "Everything is fine now, it is now circulating [the blood]," said the Virgin, and Margarita could hear and see everything. She learned that the boy's memory loss was due to fatigue because he worked so hard, so he was prescribed vitamins. Although he had eaten a few pairs of mushrooms, he had not felt anything, so Margarita had to take care of him.

### *Claudia*

Her belly was bulging and she was in pain. She was crying out for her children and her husband because she thought she was going to die. She decided to take the mushrooms with a *chjoon chjing* who was her close friend. What looked like a pregnancy was actually the product of witchcraft: "That night, I see what I have. I have an air because I used to be a promoter; I was in charge of the women."<sup>3</sup> Some of them did not like that she asked for cooperation to pay for the trips to the municipal seat; they said that she spent that money for her store. Claudia saw that "there was a thing like this, like it was a balloon, I saw it in my body." That night, she leaked a lot of water, as if she was giving birth. She also mentioned that "The hand of the *Virgencita* (a term of endearment to refer to the Virgin Mary), first grabbed my hair. Then she put her hand in my ears. She cleaned my eyes. My mouth went sideways and she grabbed it and made it all better." The Virgin also "squeezed" Claudia's belly and "rubbed" her whole body; she confided that Claudia would have died if she not had "taken the mushrooms."

### *Ricardo*

Ricardo, a 20-year-old man, went to a party with his parents and sang along with the mariachi, but started to feel a burning sensation in his eyes. The next day he could not open his right eye: "That same night my mother dreamed that lightning had struck us, but that it had only hit me." The sunlight hurt his eyes, and his affliction kept getting worse. Neither the home remedies nor the drops prescribed by the doctor in a nearby town had helped

him. The young man could no longer stand the pain and was at risk of losing his eye. It was then that his mother told him about his aunt Sofia, a *chjoon chjine*, and the possibility of taking mushrooms. Ricardo narrates that:

*By then, I was sure that this was not natural, so I went and grabbed four pairs. After about 45 minutes they began to take effect, to warm up my whole body. The first time, I was afraid; I started to see all the stars. Then they showed me several paths and I chose one. I arrived at a very beautiful church, very big, and later, I believe that by the force of the mushrooms or the Spirit, they pulled my head up and four Virgins with wine-colored mantles appeared. Two stood in front of me and two behind me. One grabbed my head, one opened my eye and one blew on me; it felt very nice, and I felt that she was pulling out the thorn, because, oh how I shed tears that time! Then I started to see reflections—so many things that appear in visions! Then my aunt asked me where I was, what the effects were. “No,” I told her, “they are already curing me.” I sat down and held on to the chair; some little animals, like spiders, were crawling on me. The first one I squashed, but when I brushed myself off there was nothing, nothing. I thought it had gotten into my boot; I wanted to get it out—these were only my visions! Then I started praying the Our Father and Hail Mary, in my head. My aunt told me not to stop praying; then the Virgins arrived. A Virgin who had a red tear—the one with the wine-colored dress—grabbed me. That’s the one who grabbed me; her hand was very tender, like a baby’s! Oh, oh, oh, oh, it hurt! One grabbed me from here and another from there. I didn’t see the others, only the one in front of me. They were going to open another door, but they asked me for more mushrooms, two or three pairs. She wanted more force to enter that door and I told them that another time. Voices can be heard there. They tell you the songs you’re going to sing, the prayers when you need them.*

When the pain subsided, Ricardo still had to fulfill one assignment:

*I arrived at my house with several people, and I also began to cure my parents of the bad air they had, because that is what the Honguito asks of you, to also cure your relatives; that is, the Honguito guides you in everything you are going to do. And yes, it is beautiful, it is a matter of having courage and faith, a lot of faith!*

One velada was not enough; the same Virgins told him that he had to take mushrooms several times, but the second time they had no effect, so Ricardo went to his aunt, who took them the third time. Since Ricardo still had a bit of the Honguito in him, she could do the work:

*So, that same night I felt how she removed all the evil that had been done to me, because I had scorpion venom and tarantula venom, which had been put in my eye. I had been cursed and at sunrise, truly. . . I never thought about it, because that night I cried about everything I had been told about how it all happened, where the evil had come from, and I never thought that at sunrise I would open my eye. At plain sight I could see everything, and I went outside and caught a glimpse of the sunlight; nothing hurt. Nothing. To this day. Since I was so grateful that day, even my aunt told me to thank God, because it was a Sunday. I went to the church first thing in the morning and lit a candle. It was wonderful!*

That night, *chjoon chjine* deciphered the specifics of the curse. The person who had hired the sorcerer was an ex-girlfriend whom Ricardo had proposed to, but she turned out to be a jealous woman, and they were always arguing. Disappointed, Ricardo began to distance himself from her, which caused her spite and desire for revenge.

#### *Monica and her husband*

From 9 p.m. to 5 a.m., at a velada held by Monica, several people benefited from the Honguito. The first was her son Jesús, a 12-year-old boy who liked to go and see how the road was being built. He had been stabbed in the leg with a rod by a man who was bothered by the presence of Jesús at the construction site. The wound made it unable for Jesús to walk. The second was a boy that "if woken up, was capable of running away like a madman." In a vision, the sage realized that he was with his parents hanging from a tree. Since that moment, they realized that the affliction was caused by a witchcraft perpetrated by a person in conflict with them. The third was Monica's nephew, who suffered from severe nosebleeds as punishment, inflicted by a *Chikon*, for having skinned and butchered a recently hunted *temazate* (deer) and washed the meat in the water of a ditch.

Monica's husband had sworn that "he would never in his life take the Saints, "because, he said, "he had many sins," but "he had no choice." He felt very bad and could not lift his arms, but he had to wait for the rains so that mushrooms would sprout again. In the "*suerte*," that is, under the effect of mushrooms, he was very aggressive and shouted, "I'm going to kill you all

right now." He would slam his fist on the table and curse. Monica remembers that the Honguito immobilized her and said, "Don't speak, this way he shall learn," and to her husband he said, "You are a bad person, go apologize to the person you had a fight with. Go right now! In the next *mixa* you will be cured if you go and apologize. And we told the Mushroom to wait, it's early in the morning, he'll go when the sun comes up." Monica's husband "saw that he had a lot of blood on his arms, and he had barbed wire," the same wire he used to fence the corrals of the cattle he raised, and which inspired the men he had quarreled with to plan their revenge against him.

### *Antonio*

Before getting married, Antonio drank a lot of beer and smoked marijuana that he grew. When Antonio realized he had an addiction, his mother and brother suggested he attend a *velada*. Antonio and his brother ingested the mushrooms together, two pairs each, and the mother took care of them:

*There I saw God with a white beard and dressed in white. He caught my attention because he smoked marijuana and showed me a fruit tree; that tree was me. He told me I had many things ahead of me and showed me New York. He showed me a river, green grass, beautiful things in order to get me to stop those vices. God told me that there is only one Path and that He is the only one to pray to, He helps you overcome illness, and He is gracious.*



## DISCUSSION

### *Doses and number of sessions*

One of the most striking contrasts between the use of the sacred mushroom in the *velada* and in experimental psilocybin-based therapeutics is the specification of sessions and quantities. In the experimental setting, this is done by systematically assessing the effects at different doses. For example, Griffiths et al. (2011) report that five monthly, eight-hour sessions at a dose of 20-30 mg/70 kg elicited perceptual acuity, anxiety, and fear during the psychoactive state in 39% of participants, and mystical experiences in 72%; positive mood effects were observed at the end of the sessions and were maintained for up to 14 months. Davis et al. (2021) indicate a reduction of up to 50% of depressive symptoms that remains for up to four weeks, after only two sessions with 20 mg and 30 mg/70 kg of psilocybin and 11 hours of psychotherapeutic support. On the other hand, as presented in the testimonies of the patients in the Mazatec context, the Honguito asks for three or four *veladas* that must be performed every four days, but He can also ask for 13 and up to 53,

depending on the severity of the case. Only the Honguito can determine the number, and considering that mushrooms are not abundant all year round and that "staying up late" is costly, whoever receives the prescription of 53 veladas will probably be under "treatment" for the rest of their life.

### *The therapeutic process*

When a person suffers from an illness caused by an evil spell or curse, the Honguito intervenes by "taking out the air" (i.e., eliminating the negative energy sent by the sorcerer). The sick person can be treated by extracting the affected part or by witnessing the recomposition of their dismembered body. Also, the person under the effect of the entheogen can remove the filth from the body with water, or by rubbing or blowing the affected part. However, releasing a person from evil is often achieved by expelling foul-smelling water through the vagina or by urination or vomit. Perhaps because of this, one way to measure the success of the velada is to notice if the person vomits, as shown in the case of Margarita.

The latter contrasts with the use of psilocybin and the interpretation of its effects in contemporary therapeutic contexts. Seven clinical studies on 130 patients diagnosed with depression and anxiety showed that psilocybin produces anxiolytic and antidepressant effects in the medium term, but can also cause headaches, nausea, and vomiting during the psychoactive state, which in some clinical experimental proposals should be avoided, if possible, so as not to interfere with the positive experiences associated with the success of the therapy (Muttoni, Ardissino, and John 2019). Thus, in the setting of the traditional use of mushrooms, vomiting is interpreted as the beginning of the healing experience, but this is not the case in contemporary experimental therapeutics, which avoids vomiting and possibly strips the patient of an important metaphorical and somatic component that could contribute to the meaning given to their illness.

In every velada, the question is concrete; it is about learning the cause and the possible inflictor of an unfortunate situation, an illness or a conflict, discovering possible enemies, and thus preventing future misfortunes, or for young persons it can be about discovering what the future holds for them. The pragmatism of the Honguito is indisputable: the cause of an illness and the people who inflicted it are there, although He does not always show their faces to prevent revenge from furthering conflicts among close relatives and neighbors, as shown in the testimony of Ricardo and his injured eye.

On the other hand, the pragmatism proposed in the setting of western psilocybin-based therapeutics is different. The robustness of the results is observed through the development of attitudes assessed with psychometric instruments or using diagnostic criteria from psychiatric manuals that claim to be applicable to all patients. For example, there is an increase in the sense



of empowerment and long-term acceptance in patients diagnosed with depression and anxiety (Aday et al. 2020) and a reduction of up to 50% of psychiatric symptoms in patients diagnosed with major depression (Davis et al. 2021). Indeed, psychometric and psychiatric assessments are valuable for therapeutic intervention. However, standardization of these effects as a single measure not only overlooks diversity, but also excludes people whose frames of reference concerning mental health do not conform to a standard psychiatric symptomatology. This is the case of Mazatec communities whose members may experience sadness, listlessness, or euphoria as part of an illness, but in their medical imaginary, depression and anxiety, as they are known in psychiatry, have no place.

### *The experience of illness and healing*

Illness is caused by specific community events that are part of the setting in the Mazatec context and are recognized and addressed as part of the patient's healing. Individual and collective experiences are conditioned to processes that are congruent with the social environment, beliefs, collective imaginary, and, in general, with the Mazatec culture. This is where their efficacy comes from. Therefore, the setting of the traditional use of mushrooms involves not only the patient, but also the ritual specialist, family members, or others with close ties to the patient. This vision is different from that of contemporary therapeutics, where healing is attributed to the patient's individual experiences of well-being, ignoring interpersonal causes and the social bonds that could be reestablished as part of the healing process. For example, cancer patients treated with psilocybin share "enlightening" experiences that lead them to understand about forgiveness and the important things in life, but the aspects to be forgiven and guidance to do so are not necessarily described or analyzed in the scientific reports (Grob et al. 2011; Spiegel 2016). The Mazatec setting and set emphasize collectivity and social reciprocity as part of healing, whereas scientific reports describe a more individualistic approach to healing.

The entheogenic trance induced by the Honguito projects images irrefutably showing evil being eradicated from the body, leaving the body free from harm. As described in the section "The Honguito: the blood of Christ," or in Gudelia's testimony, these images involve sensory and somatic experiences. The presentation of these images could be explained by the activating effects of psilocybin on the visual, auditory, interoceptive, and somatosensory systems of the brain, as has been described in neuroscientific research with animal models since the 1960s and 1970s (Roberts and Barley 1967; Scholes and Gutnick 1970; Meldrum and Naquet 1971), and recently through functional magnetic resonance imaging in humans (Carhart-Harris et al. 2012). However, the mere projection of images during the velada is not enough. In

addition, faith in the power of God, the Virgin, Jesus Christ, and the Honguito motivates the transformation, and the following morning or a few days later, the person is fully or partially recovered; the latter occurs when the Honguito has recommended other veladas. Certainly, the recovery or well-being felt after the ceremony, as well as after experimental therapeutics, can be understood from the agonist function of psilocin on 5HT<sub>2A</sub> serotonin receptors. Serotonin is a neurotransmitter involved in the sense of well-being and in various cognitive processes, such as learning, attention, social behavior, and sleep. Nonetheless, this sense of well-being would also stem precisely from the trust placed in the Honguito and God, which would imply a deep awareness of accompaniment by a divine entity during the healing process. Some neuroscientific experiments may provide a guide to understanding this experience of accompaniment. For example, brain activation has been recorded by functional magnetic resonance imaging when Christian believers pray and establish a dialogue with their God. Activation is reported in the temporal pole, the prefrontal cortex, the temporo-parietal conjunction, and the precuneus, whose cognitive functions include linguistic processes, recognition of others, attention, and understanding of social processes that, together, involve social cognition equivalent to that exhibited when engaging in dialogue with others (Schjoedt et al. 2009).

In another example, brain activation was recorded in non-believers and Christian believers as they listened to prayers for intercession and healing by a speaker known for his healing powers. For believers, listening to the prayer produced a deactivation or low signal in a frontal brain network bilaterally covering the medial and dorsolateral portions of the prefrontal cortex, which is implicated in executive and social cognition. This suggests that believers inhibit such cognitive functions when listening to the prayer. In fact, the deactivation predicted their subsequent positive assessments of the speaker and their experience of God when listening to the prayer (Schjoedt et al. 2011). These results do not imply a brain function univocally associated with the interlocution with the divine. Rather, they suggest that the experience of the presence of the divine, or of the one who represents it, involves a particular category of social interaction that is supported by neurocognitive processes equivalent to those used in relationships or interactions with others, in particular, with people who are trusted. Although this postulation needs further exploration and should consider models with diverse beliefs and relationships, conclusions can be drawn from it. The relationship with God, the Virgin, or Jesus Christ constitutes a crucial part of the velada setting. Perhaps the divine attribution or resemblance of these divine entities with the Honguito makes it easier to see the sacred mushroom as a volitional being with personality, enabling a person to hear and see more attentively the images it projects and the indications it dictates, and to consolidate faith and trust in Him.

Mystical experiences are one of the constants associated with psilocybin use in experimental studies. However, unlike what is observed in the velada, such experiences are referred to abstractly as feelings of sacredness, interconnectedness, ineffability, or truth about nature and reality (James et al. 2020). Experiences may vary depending on the person's religious profile and can be associated with various behavioral changes. For example, Griffiths et al. (2006) showed that 22 of 36 people who used psilocybin in controlled settings experienced feelings of oneness and transcendence of time and space, but these occurred primarily in people with religious inclinations. Although these investigations mainly use psychometric scales that do not analyze the content of people's religious or mystical belief, they allow an immediate, quantitative, and systematic assessment of the reported experience (e.g., see Barrett, Johnson, and Griffiths 2015; MacLean et al. 2012; Majić, Schmidt, and Gallinat 2015). Interestingly, it has been shown that the intensity of mystical experiences during the psilocybin effect predicts changes in the "openness" personality trait, which is characterized by imagination, creativity, intellectual flexibility, and sensitivity (MacLean et al. 2011). One experience in particular stands out in scientific reports: the dissolution of the self. This experience is understood in the framework of meditative practices recently adopted in western therapeutic contexts. Smigielski et al. (2019) report that the use of psilocybin increases and enhances the depth of meditation and the experience of dissolution of the self in mindfulness practitioners, and that its optimism, possibility of emotional reappraisal, and psychosocial benefits last up to four months. The two previous findings suggest that, in effect, the experiences generated by the Honguito, or psilocybin, become meaningful from a person's unique religious and spiritual set or baggage. It is this baggage that favors attitude changes and therapeutic effects in the medium and long term, and it enables indirect semantic priming, facilitated by the effects of psilocybin on the cognitive language network (Spitzer et al. 1996) and through which people define and communicate their experience by using concepts and terms they are familiar with because of their beliefs.

#### *Otherness during the entheogenic experience*

Social and interpersonal elements during the velada are relevant in the Mazatec set and setting. Occasionally, either a sick or afflicted person has to heal another person who is either present in the ritual or elsewhere. This means that those who participate in the velada are in some way "connected," and that the Honguito may decide to address unexpected events that arise during the ritual. Ultimately, the work is collective. There is the *chjotą chjine* (officiator and director) and one or more patients, but also family members who reinforce the work of the guide. Possibly, the collective use of mushrooms favors empathy among the participants (i.e., emotional contagion

or shared affective experiences). Although empathy is concretely affective, it is striking that, during the ethnographic recording, a patient explained that the effect of the Honguito can become contagious during a *velada*, somehow spreading to another participant so that they could do the work. It was even mentioned that the same images subsequently appeared to several of the participants. Certainly, this point deserves further study in order to assess whether, perhaps, the empathy induced by psilocybin consumption in a group could propitiate a form of perceptual bonding among those present.

The empathic effect is a point of coincidence with some contemporary therapeutic proposals. Several reports indicate that psilocybin-assisted psychotherapy has enhanced effects on depression, and overall positive effects on behavior, when it involves social support and peer-to-peer dialogues that foster bonding or connection between research participants (Carhart-Harris et al. 2018; Griffiths et al. 2018; Watts et al. 2017). In this regard, psilocybin appears to have an impact on affective dimensions underlying these bonds. For example, after attending a group retreat that used psilocybin, 55 people showed higher levels of empathy and satisfaction with their lives (Mason et al. 2019). Similarly, during the *velada*, prayers strengthen unity among the participants. Prayer leads to the effect of the entheogen because it summons the Honguito and the divinities that accompany it; and if the Honguito leaves, prayers bring it back. That is, the Honguito is also a being with whom one empathizes, contrary to scientific studies in which prayer is considered a mystical experience that derives from ingesting the substance (psilocybin).

The Honguito also serves as a judge, as a father who scolds and evaluates the behavior of those who ask to be cured, and does not hesitate to make them see their faults, punish them, and demand that they make amends for their mistakes. As God, he presents himself as a moral authority with the power to deliberate and discern between good and evil. For some, part of the healing includes subsequent reconciliation, such as apologizing to those they wronged and hurt, as described in the case of Monica's husband. Thus, the "personality" of the Honguito takes on a moralizing and communitarian nuance, forcing the person who has behaved antisocially to rectify their actions towards others. The Honguito prefers that the person ask for forgiveness rather than return the evil spell to satisfy their thirst for revenge. The emotional state that motivates apology and reconciliation may be triggered, in part, by the effects of psilocybin in the brain. Functional magnetic resonance imaging research shows that psilocybin causes hypoactivation of the amygdala and a consequent inhibition of negative emotional reactions, such as fear or anger (Kraehenmann et al. 2015). This hypoactivation may be explained by the hyperactivation of the medial prefrontal cortex (mPFC) also triggered by psilocybin. The mPFC maintains inhibitory projections to the amygdala, and its cognitive function involves autobiographical memory,

suggesting that access to memories during the psychoactive state regulates emotional experience. This is coupled with increased functional connectivity between the anterior and posterior cingulate cortex. Thus, psilocybin is proposed to modulate the role of both brain regions, whose cognitive functions include attention, social decision-making, and representation of the referential self (Carhart-Harris et al. 2017). Interestingly, these four brain regions are part of a network necessary for experiencing and expressing moral emotions, such as outrage, guilt, compassion, or revenge (Atilano-Barbosa et al. 2022; Mercadillo et al. 2011). In this way, the effects of psilocybin, as a substance, together with the moral value assigned to the personality of the Honguito, favor pro-social actions that are reinforced in the Mazatec imaginary and are part of individual and collective healing.

The moralizing and compassionate figure of the Honguito, within the Mazatec community perspective, plays an important role in understanding its intervention in cases of addiction. When a person tries to give up alcohol or other drugs, the Honguito, instead of reprimanding them for their behavior, shows them a better future and gives them a reason to live. Pilot studies have proposed psilocybin as a treatment for tobacco and alcohol abuse (Bogenschutz et al. 2015; Johnson et al. 2014); the mystical experiences presented predict therapeutic success evaluated by reducing consumption (Garcia-Romeu, Griffiths, and Johnson 2014). As previously proposed in cases of addiction treated through the use of entheogens, the healing effect derives from the acknowledgement that one is living a painful reality but that it is also accompanied by experiences of kindness, compassion, and tranquility (Caro, Enciso, and Mercadillo, 2020), which is shown in the case of Antonio, a beer and marijuana consumer to whom God shows a new path during the *velada*. It is perhaps the calming experiences induced by the Holy Children, endowed with personality and authority, that instill in the person with addictions peace and a reconnection with themselves and others. In this sense, far from maintaining a prohibitionist and criminalizing vision of addictions, healing through the Honguito provides an existential reconfiguration that favors a resolute, voluntary, and moral change.



## CONCLUSIONS

Research from experimental psychology, cognitive sciences, and neurosciences, developed under the resurgence of psychedelic medicine, have reported important findings to understand the effects of psilocybin. Yet, this research is still scarce and shows several limitations for generalizing interpretations. Methodologies are varied and include interviews, surveys, and psychometric instruments or recording of brain function, but no study has

provided a comprehensive and detailed description of the context, dynamics, and role of each of the participants; in particular, the role of the therapist or researcher in guiding the experience. While mystical-type experiences are constants, the description of such experiences is primarily done by psychometric instruments that barely explore content, origin, or beliefs, which, as discussed, are an essential part of the set that can shape the healing experience through magic mushrooms or psilocybin. Transdisciplinarity is seldom used and generally attempts to intertwine brain function with psychometric assessment and, rarely, with phenomenological interviews or clinical observations. Moreover, the social and community aspect derived from therapeutic interventions is hardly, if ever, addressed. Therefore, the experimental study of psilocybin is still at an early stage.

For its part, anthropology has proven the relevance of the set, attitudes, and beliefs that shape the patient's inner world and contribute to the effectiveness of the therapeutic ritual: faith and the certainty that the divinity itself will be the architect of change. Likewise, the entheogenic rite—the setting or physical and social scenario—favors subjective processes that can have effects on neurobiological functions by "releasing" emotions that are sometimes repressed. We could even suppose that the "dissolution of the self," suggested as a fundamental part of contemporary psychedelic therapy, is inherent to the process of healing and conflict resolution in the indigenous ritual context. In fact, one of the aspects that could validate such a conjecture is the experience in which the Honguito forces the person to ask for forgiveness. In this context, the "ego" is metaphorically diminished by exhibiting its faults.

On the other hand, it is also worth noting the importance of diet for those who ritually consume the sacred mushrooms. Although a thorough investigation of the subject is required, we can argue that sexual abstinence would have the purpose of not interfering with the effect of psilocybin, which is likely to last for four days after ingestion.

We would also like to emphasize that often, in the traditional context, the Honguito requests more than one *velada*, which contrasts with the delivery of psilocybin in a previously defined number of sessions or, sometimes, in a single session. Since it has been reported that the improvement in many cases is not permanent, we wonder if extending the number of sessions or experimentally investigating the effects of recurrent mushroom use should be considered for better results.

The rise of psychedelic therapy urges us to suggest that, both in protocol design and in results interpretation, contributions from anthropological research should be examined, specifically regarding the analysis of the set and setting based on the experience of native peoples who for hundreds of

years have used sacred plants not only as part of their therapeutics, but also as a way of seeking fusion with the social and cosmic environment.

Today, those of us dedicated to research on sacred mushrooms and psilocybin have a duty to overcome the barriers that have historically been erected around our disciplines and to foster an open dialogue that lays the foundations for a transdisciplinary approach. In this paper, we seek to show the complexity of the set and setting of the *velada* and to understand the experiences within it through the interaction between natural systems (e.g., the ecology of psilocybin mushrooms and its influence on mushroom collection for use in the *velada*, or the chemistry of psilocybin and its effects on brain function and cognitive and affective processes) and social systems (e.g., the cultural properties of the Mazatec context, community relationships, and their inherent morality). Understanding these interactions involves collaboration and knowledge exchange, not only among researchers from different disciplines, but also with other parties involved in the problem, such as the ritual specialist and the users or patients themselves, who should be considered not only as subjects of analysis, but also as bearers of experiences and knowledge crucial to comprehending the phenomenon.

The transdisciplinarity we propose involves the integration of knowledge from different disciplines, such as anthropology, neurosciences, or psychology, as well as the reflection that researchers from each of them carry out collectively to discuss their own frameworks and assumptions. Furthermore, transdisciplinarity involves what Wickson, Carew, and Russell (2006) call a paradox (i.e., that the integration of knowledge from multiple disciplines also implies assuming that different frameworks or assumptions may be methodologically incompatible to understand different levels of reality of the phenomenon). For example, anthropological understanding about mushrooms and psilocybin implies a phenomenological reality of experience that can be understood through ethnographic records and analysis, but another body of knowledge, such as neuroscience, is needed to elucidate the neurochemical reality of the mushroom or psilocybin, which is part of the human biology that contains and expresses experience.

This paradox is not necessarily an impediment to transdisciplinary efforts. Different proposals that have emerged since the second half of the twentieth century provide guidelines for this. Francisco Varela's neurophenomenology, sophisticated in enactive cognition, proposes that the recording of experiences (e.g., in the first person, later translated into interpretable reports in the third person) and of brain function when facing the same phenomenon, provides two types of data that can be jointly interpreted to deal with the gap between psychology and neurosciences. This proposal gives the notion of the "body"—as the substratum of individuality and the basis of the living and the cognitive—emergent qualities of knowledge that can be accessed through the

information provided by the person who possesses such a body (Varela, Thompson, and Rosch 1991). The proposal of social neuroscience, as a neurobiological paradigm to elucidate the brain bases and mechanisms underlying social behavior and cognition, has increasingly sophisticated its premises to involve the communicated experience in the experimental designs for recording brain function. Thus, it suggests interpreting experience and brain function as an intertwining that affronts common aspects of an individual's life (Mercadillo 2010). Neuroanthropology has focused on relating certain social and cultural situations that shape the function, and even the morphology, of the human brain, using ethnography as a tool in conjunction with neuroimaging (Domínguez-Duque et al. 2010).

Transdisciplinarity is, then, a first step towards an exercise that—based on the entheogenic experience of the Mazatec people—can result in a better understanding of the effects of psilocybin and what it represents for therapeutics in the western context. This should prioritize the experiences of the participants in the context of both traditional and experimental medicine, and consider them as bio-psycho-socio-cultural actors in all their complexity.



#### NOTES

<sup>1</sup> We have not found an explanation for the use of number 53; various numbers are considered sacred, such as 4, 7, and 13. We can deduce that it is the product of multiplying 13 by 4, 52, plus 1. Likewise, in the divination practice of corn tossing, the amount of kernels tossed on a white cloth, as we have observed in the field, is between 33 and 60.

<sup>2</sup> Aromatic resin obtained from trees belonging to the genus *Bursera*

<sup>3</sup> She is referring to a social welfare program.

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