

# Mycophagy as a Basic Food of Traditional Gastronomy in Xalatlaco, State of Mexico\*

[English Version]

La micofagia como alimento base de la gastronomía tradicional en Xalatlaco, Estado de México

A micofagia como alimento básico na gastronomia tradicional de Xalatlaco, Estado do México

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## Abstract

Gastronomy determines the history and culture of a country or region, is transmitted from generation to generation, and builds identity and food heritage **Objective:** To analyze the traditional knowledge, consumption and gastronomic importance of wild mushrooms in the municipality of Xalatlaco, State of Mexico. **Methodology:** Cross-sectional-ethnographic. Target population: collectors, traditional cooks, and consumers of wild mushrooms. The sampling statistic was by

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snowball to saturation and qualitative data analysis by percentile. The identification and classification of mushrooms by their common names were based on the collectors. The culinary use of these mushrooms was determined by the cooks, who recognized the mushrooms that were collected. **Results:** Traditional knowledge is inherited and transmitted through mushroom consumption. Culinary identity is at risk due to the generational gap and the evolution of eating habits. Seventeen varieties of edible wild mushrooms, seven types of preparation, 17 recipes and one preservation method were documented. *Chilpaztle* is recognized as a gastronomic identity dish. Likewise, the living memory, traditional, and collective culinary knowledge is preserved in “*La danza de los Tlaxinquis*” (The dance of the Tlaxinquis). **Conclusions:** Xalatlaco is immersed in globalization, preserving its traditional knowledge in the hongueros and cooks. It maintains the living memory of its past through gastronomy, as well as its artistic and religious representations, which reaffirm its identity and ethnicity. Mycophagy has been and continues to be the basis of gastronomy in this municipality. Therefore, sustainable management, the revaluation of traditional knowledge, and the rescue of food culture should be the main focus of regional gastronomy.

**Keywords:** edible wild mushrooms; traditional knowledge; culinary identity.

## Resumen

La gastronomía determina la historia y cultura de un país o región, se transmite de generación en generación, y construye la identidad y el patrimonio alimentario. **Objetivo:** analizar el conocimiento tradicional, consumo de hongos silvestres e importancia gastronómica en el municipio de Xalatlaco, Estado de México. **Metodología:** de corte transversal-etnográfica. Población objetivo: recolectores, cocineras tradicionales y consumidores de hongos silvestres. El estadístico muestral fue por bola de nieve hasta la saturación, y análisis de datos cualitativo por percentil. La identificación y clasificación por nombre común de los hongos fue con base en los recolectores, y el uso culinario determinado por las cocineras a partir del reconocimiento de los hongos colectados. **Resultados:** el conocimiento tradicional es heredado y transmitido bajo el consumo de hongos; identidad culinaria que está en riesgo por el salto generacional y la evolución de hábitos alimenticios. Se documentaron diecisiete variedades de hongos silvestres comestibles y siete tipos de preparación, diecisiete recetas y un método de conservación. Se reconoce al «Chilpaztle» como plato identitario gastronómico. Asimismo, se preserva la memoria viva, conocimiento tradicional y culinario colectivo en «La danza de los Tlaxinquis». **Conclusiones:** Xalatlaco está inmerso en la globalización, resguarda su conocimiento tradicional en los hongueros y cocineras, manteniendo la memoria viva de su pasado a través de la gastronomía y sus representaciones artísticas y

religiosas; las cuales reafirman su identidad y origen étnico. La micofagia ha sido y sigue siendo la base de la gastronomía en este municipio, por ende, el manejo sustentable, la revalorización de los conocimientos tradicionales y el rescate de la cultura alimentaria deben ser los ejes de la gastronomía regional.

**Palabras clave:** hongos silvestres comestibles; conocimiento tradicional; identidad culinaria.

## Resumo

A gastronomia determina a história e a cultura de um país ou região, é transmitida de geração em geração e constrói a identidade e o patrimônio alimentar. **Objetivo:** analisar o conhecimento tradicional, o consumo de cogumelos silvestres e a importância gastronômica no município de Xalatlaco, Estado do México. **Metodologia:** estudo etnográfico transversal. População alvo: colecionadores, cozinheiros tradicionais e consumidores de cogumelos silvestres. A estatística da amostragem foi por bola de neve até a saturação, e a análise de dados qualitativos por porcentagem. A identificação e classificação por nome comum dos cogumelos foi baseada nos coletores, e o uso culinário foi determinado pelos cozinheiros a partir do reconhecimento dos cogumelos coletados.

**Resultados:** o conhecimento tradicional é herdado e transmitido através do consumo de cogumelos; uma identidade culinária que está em risco devido ao salto geracional e à evolução dos hábitos alimentares. Dezesete variedades de cogumelos silvestres comestíveis e sete tipos de preparação, dezessete receitas e um método de conservação foram documentados. O "Chilpaztle" é reconhecido como um prato de identidade gastronômica. Além disso, a memória viva, o conhecimento culinário tradicional e coletivo é preservado em "La danza de los Tlaxinquis". **Conclusões:** Xalatlaco está imerso na globalização, preserva seus conhecimentos tradicionais nos cogumelheiros e cozinheiros, mantendo a memória viva de seu passado através da gastronomia e suas representações artísticas e religiosas, que reafirmam sua identidade e origem étnica. A micofagia tem sido e continua sendo a base da gastronomia neste município, portanto, a gestão sustentável, a revalorização dos conhecimentos tradicionais e o resgate da cultura alimentar devem ser os eixos da gastronomia regional.

**Palavras-chave:** cogumelos silvestres comestíveis; conhecimento tradicional; identidade culinária.

## Introduction

Gastronomy determines the history and culture of a country and generates its own identity from traditions that mature over time. Food appeals to both the interior and exterior senses, evoking memories that go beyond the confines of the personal and physical. It incorporates the collective and evokes the culture of the people who transmit it from generation to generation as part of their identity, which becomes engraved in the memory and provokes nostalgia (Triviño & Forero, 2019; Padilla, 2020). Mexican gastronomy has been recognized as an intangible heritage of humanity not only for the dishes it represents, but also for the techniques, flavors, ingredients, and recipes that it embodies, as well as the rituals required for its conception. It is a symbol for Mexicans (Mejía et al., 2014).

According to Garibay et al. (2018), Mexican food has historically been a fusion of ingredients readily available in the local area. Mexican cuisine is currently one of the most popular in the world, known for its wide variety of delicacies that include herbs, plants, insects, and field animals. However, its greatest distinction lies in its great diversity of wild fungi.

There are approximately 2,300 species of edible and medicinal wild mushrooms worldwide, with an estimated 450 species consumed in Mexico and 350 used in traditional medicine by the different native groups that inhabit the country (González et al., 2021). Edible wild mushrooms are considered non-timber forest resources, which provide income to communities and contribute to the diet. In this sense, communities possess biological, ecological, and cultural knowledge regarding aspects such as the morphological structures of wild mushrooms, their place and time of growth, the substrates where they develop, the types of vegetation conducive to their development, and their forms of use and cultural importance (Burrola et al., 2012).

Various authors have investigated the cultural, economic and biological implications of edible wild mushrooms. Authors such as García et al. (2019) conducted a review of ethnomycology, including its medicinal, food, and economic uses. Burrola et al. (2012) documented the use of mushrooms, local ecological knowledge, the requirements for their growth, the collection process, sale, and use. For their part, Jasso et al. (2019) analyzed the ecological-cultural context of wild edible mushrooms in a community in central Mexico. In their studies, they recorded 17 species of culturally significant wild edible mushrooms, and 27 mushroom dishes that are enjoyed from June to October. Molina et al. (2019) identified the use and Traditional Ecological Knowledge (TEK) on wild edible mushrooms possessed by collectors from an indigenous community in central Mexico. From another perspective, in 2018, Ruan conducted a study on the

collection practices of the Tzotzils of Chamula Chiapas, Mexico, examining how these practices have changed over time and exploring strategies for identifying edible and toxic species. Likewise, in 2006, Arteaga and Moreno conducted a study to assess the phenology and appearance of fungal species, as well as the production per surface unit and economic value per hectare of the forest where the fungi develop. They also examined the ecological conditions of the forest. Pinzón et al. (2021) presented a bibliographic compilation of edible wild mushroom species from the Yucatan peninsula with potential for human consumption. Cano and Romero (2016), as well as González et al. (2021) studied the chemical composition, biological activity, and therapeutic and nutritional benefits of wild mushrooms from Mexico.

The effects of globalization on Mexican food culture have led to the loss of pre-Hispanic culinary roots, which has impacted people's health and quality of life (Garibay et al., 2018). In this context, gastronomy —as a contemporary evolutionary concept of human eating habits, art, or science of good eating and drinking, and cultural tradition, society, and civilization (Bahls et al., 2019)— seeks to answer questions such as where, how, when, and why food is consumed and prepared. In this sense, mycophagy is especially relevant due to its nutritional importance.

Mycophagy consists of two Greek words, *myco* (fungus) and *phagein* (eat). It can be defined as the act of eating mushrooms or any of their parts. This term specifically refers to the consumption of macromycetes, which are the basis of gastronomy in Xalatlaco, Mexico. In this regard, few investigations have delved into the analysis of consumption and culinary contributions of traditional cooks. Therefore, the objective of this work is to analyze traditional knowledge, the consumption of wild mushrooms, and gastronomic importance in the municipality of Xalatlaco, Mexico.

## Methodology

The analysis was carried out in the municipality of Xalatlaco, State of Mexico, located between parallels 19°08' and 19°14' north latitude, and meridians 99°41' and 99°20' west longitude. With altitudes ranging from 2,600 to 3,800 meters above sea level, the climate is semi-cold with abundant rain in summer. The forest area comprises little more than 50% of the municipality's territorial extension. Due to the rugged terrain, there is a diversity of microclimates that favor the

flora of the area, including conifers, shrubs, and wild mushrooms. The latter predominates during the rainy season, which lasts from June to November.

The investigation was cross-sectional and constitutes the study of an event at a given moment. The time unit is given by the research conditions to collect and analyze data from an ethnographic sample (Cabrera et al., 2006).

In this study, the researcher selects the place and participants by collecting the information and analyzing the data (Hernández et al., 2014). Its compilation was based on semi-structured interviews during the period July-August 2021. And, finally, the statistical method for the selection of the sample from the target populations was non-probabilistic snowball, determined with the saturation criterion (Elorza, 2008). Regarding the analysis of the information, it was qualitative and quantitative based on percentiles.

The target population were wild mushroom collectors, consumers, and traditional cooks in Xalatlaco, State of Mexico. The selection criteria of the collectors (mushroom hunters) was the age range of 38-50 years, with the knowledge of edible wild mushrooms. The sample was made up of 15 people, and the variable for this group was knowledge of wild mushrooms, and perception of consumption by the population.

Alternatively, the sample of consumers consisted of 30 subjects aged 20-50 years. The variables were knowledge, consumption, preference, perception of flavors, and culture of consumption of edible wild mushrooms. Regarding the traditional cooks, the selection criteria consisted of individuals 70 years or older with culinary knowledge of wild mushrooms and wood cooking, made up of seven participants.

The collection of the mushrooms was carried out in the *Agua Grande* area—with a preponderant vegetation cover of oyamel pine, oaks and bushes—during the morning in the company of traditional mushroom hunters, who, before starting the search and collection, performed a ritual asking the forest for permission to enter and cut the specimens. Once the fungi were identified, they were collected trying to leave a part of the volva, without completely extracting the mycelium. The specimens were transferred to the house of one of the collectors, according to the methodology proposed by Cifuentes et al. (1986), so that the specimens did not suffer any damage. The identification of the fungi was carried out by the mushroom hunters. The classification was made according to their common name and the assignment of the scientific name was carried out through photographic galleries (Naturalista, 2022; Institute of Biology, 2022; Malacara, 2019; Cuesta & Santamaría, 2012; Arteaga & Moreno, 2006)

Finally, the culinary use of edible wild mushrooms was determined by the traditional cooks, who independently identified the type of mushroom from the photographic memory of previously collected mushrooms. During the patron

saint festivities of the San Juan neighborhood (June 22) in Xalatlaco, Mexico, *La danza de los Tlaxinquis* (the dance of the Tlaxinquis) was observed and documented.

## Results

Xalatlaco has ceased to be an indigenous town. However, it preserves knowledge and traditions that provide it identity (González, 2015). In this sense, it is worth mentioning that a considerable number of species of wild edible fungi, mycophilic and mycophagic patterns, as well as knowledge and traditional culinary heritage is found and protected in the rural forest ethnic communities of Mexico (García & Thomé, 2019) as can be seen in the results of this research.

### Traditional Knowledge and Gathering of Wild Mushrooms

The collection of edible wild mushrooms (EWM) is an activity that dates back to ancient times, which was complemented by the collection of firewood. It is said that formerly, the natural production of fungus was abundant. However, according to Orozco et al. (2018), as the vegetation cover has decreased, the organisms have been losing ground in their natural habitat. According to the participants, the knowledge of edible species was passed from generation to generation, and currently, only traditional collectors have this information.

The foregoing is in accordance with what was stated by Estrada et al. (2009) and Burrola et al. (2012), who documented the importance of traditional knowledge inherited through generations and defined it as the set of knowledge and practices collectively generated, selected, and accumulated over time, which are stored in memory and transmitted along generations. This knowledge gives its holders a place in the social structure and gives them a defined identity. Likewise, Jasso et al. (2019) mention that it is men who safeguard traditional knowledge and are in charge of collecting. In contrast, the Institute of Biology (2022) cites that collecting is not limited to the male gender since both men and women carry out this activity. However, women are present in the entire process of using the mushrooms, being the main individuals responsible for conserving and transmitting the knowledge of this heritage (Ruan, 2018).

In this regard, Mejía et al. (2014) define heritage as a cultural aspect that a society attributes to certain specific, historical, aesthetic, and use values. Therefore,

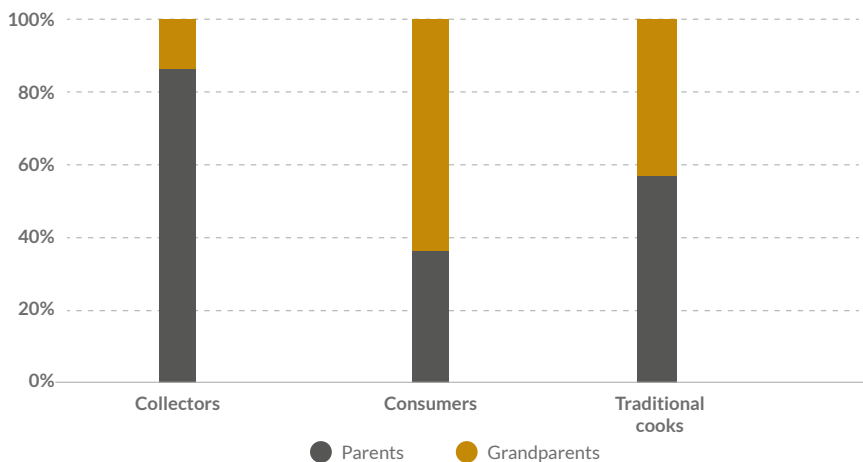
due to heritage, knowledge, values, emotions, and ideals, among other aspects, are inherited from one generation to another through symbols where the past, present, and future coexist.

## Consumption and Identification of Edible Wild Mushrooms

Both the taste for consumption and the identification of edible wild mushrooms is inherited. In the case of collectors, 86.6% consumed mushrooms in the family provided by their parents, while 13.3% remember that it was their grandparents who fed them. In this sense, the “mushroom hunters” are people with knowledge of habitats, growing season of the species of interest, environmental factors that favor their development, and practices related to the identification, collection, transportation, conservation, and preparation of wild mushrooms (Institute of Biology, 2022).

Alternatively, 63.3% of the participants consumed mushrooms with their grandparents, while the other 36.6% with their parents. Regarding traditional cooks, 57.1% of the participants reported that identification and consumption was provided by their parents, while 42.9% stated that it was instilled by their grandparents (Figure 1).

**Figure 1.** Generational Chain of Food Culture of Edible Wild Mushrooms, Transmitted in Three Study Populations in Xalatlaco, State of Mexico.





The above data highlight the transmission of knowledge directly from one generation to another. Additionally, it shows the generation gap in the consuming population, which shows the risk of culinary identity. In this sense, gastronomy evolves in accordance with existing social needs (Reyes et al., 2017).

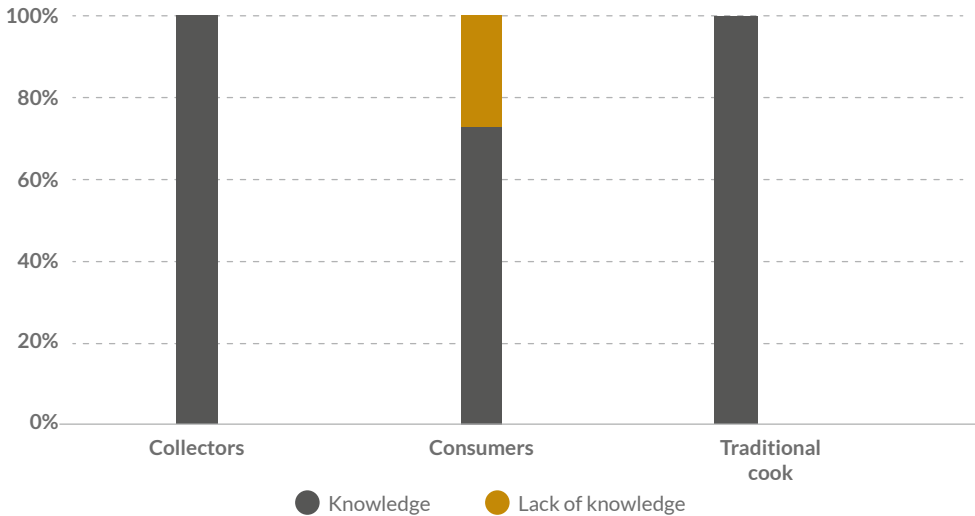
The change in eating habits can be explained through economic and social factors suffered in Xalatlaco and in the original peoples of Mexico over the second half of the 20th century. This occurred due to the increase in schooling, loss of the native language, abandonment of agriculture, massive migration, as well as the diversification of economic activities for survival. Consequently, the effects of globalization have directly influenced the detriment of culinary roots. According to Fierro et al. (2019), the hegemonic effect of the market has led to a change in eating habits, where parents eat lunch at work and children at school forgetting about the homemade food, losing the habit of cooking and thus, the associated culinary skills. According to Reyes et al. (2017), the connotation and recognition of gastronomy as an intangible heritage of society is important because the beliefs, ways of life, practices, experiences, and food customs are part of the heritage of the protected culture.

In terms of the transmission of traditional-intergenerational knowledge (as can be seen in Figure 2), the traditional collectors and cooks were fully able to identify EWM. In this regard, Cano and Romero (2016) point out that cultural heritage includes not only the cooking of EWM, but also the categorization and identification based on their shape, color, or consistency, location of origin, and time of development during wet weather.

In contrast, 73.3% of the consumers surveyed correctly identified the wild mushrooms, as opposed to 26.7% who did not. According to Gutierrez et al. (2019) and Ruan (2018), the traditional use and collection of wild mushrooms is linked to the condition of poverty experienced by rural families, and it is accompanied by a forgetting of wild resources and traditional methods of taking advantage of them.

Finally, consumers do not understand the distinction between wild and cultivated mushroom, and there is even confusion between the two species. According to Ceron et al. (2020) and Cano and Romero (2016), the most well-known macromicetes among the population are those edible and cultivable like Champignon and Oyster (*Agaricus bisporus*, *Pleurotus ostreatus*), followed by *Lentinus edodes* and *Flammulina velutipes*, *Amanita caesaria*, *Boletus edulis*, *Cantharellus cibarius*, *Thicholoma magnivelare*, *Lactarius deliciosus*, and *Tuber melanosporum*.

**Figure 2.** Knowledge Edible Wild Mushrooms from Three Study Communities in Xalatlaco, Mexico.



Currently, in the community of Xalatlaco, the traditional gathering and cooking groups that were surveyed reported learning about 17 different types of edible mushrooms that were collected during the rainy season that lasts from June to November. (Figure 3). The results agree with what Jasso and others reported. (2019) and Martínez et al. (2019) in San Jerónimo, Acahualco, and Agua Blanca, Mexico where culturally and traditionally, the same number of EWM varieties are consumed.

**Figure 3.** Morphology of the 10 Different Types of Edible Wild Mushrooms Found in Xalatlaco, Mexico.

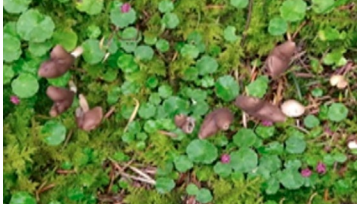
1. Scaly chanterell (*Gomphus floccosus*)



2. Clustered coral (*Ramaria formosa*)



3. Fried chicken mushroom (*Lyophyllum decastes*)



4. Fly amanita (*Amuscaria colours*)



5. Blackening russula (*Russula nigricans*)



6. Xocoyol (*Laccaria laccata*)



7. Blushing morel (*Morchella esculenta*)



8. Mosaic puffball (*Clavantia utriformis*)



9. Enchilados (*Cantharellus friesii*)



10. Tejamalinerio (*Citocybe geotropa*)



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Source: Author's elaboration based on field information, Naturalista (2022), Instituto de Biología (2022), Malacara (2019), Cuesta y Santamaría (2012) y Arteaga y Moreno (2006).  
Photos by Perete Lara Javier.

Ruan (2018), alternatively, identified 21 species of edible mushrooms in the Totzil communities in Chiapas (Pinzón et al.). Nineteen edible mushrooms species were identified in the southeast of Mexico in 2021 (Estrada & colleagues). In 2009 just over 67 varieties of wild edible mushrooms were documented in markets around the Sierra Nevada of central Mexico.

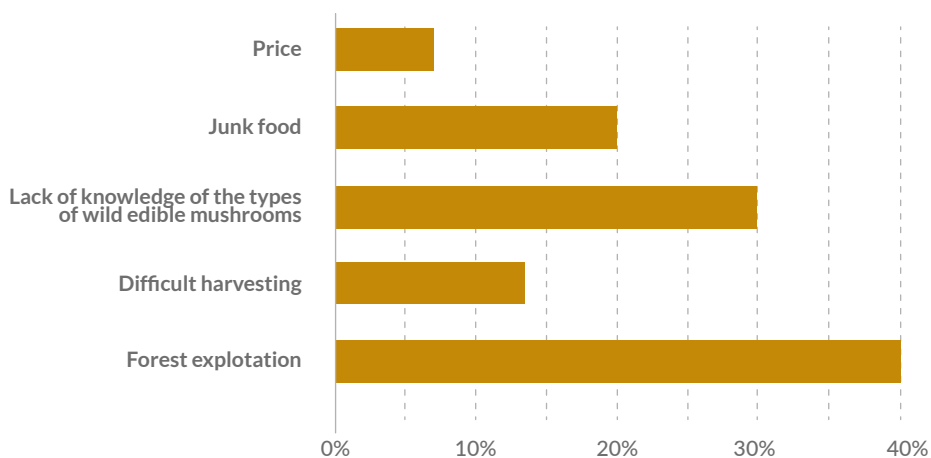
The most common EWM varieties identified by the survey groups were, in accordance with its morphology and traditional names: Clavo, Panza or Pancita, Mazorca and Chilero. According to Gutierrez et al. (2019) and Cano and Romero (2016), the residents identify the species by their traditional names, which is crucial for understanding the classification criteria that allow for cataloging them in hierarchical systems that are quite similar to western ones. Cano and Romero (2016) as well as Estrada et al. (2009) mention that the preference for some varieties is due to the easily recognizable morphology (panzas [bulging, convex shape] and escobetas [brush shape]), making it impossible to confuse it with poisonous fungus, as well as the consistency, flavor, and culinary preparation.

The number of food varieties that have been identified and incorporated into the diets of forest-rural communities reveals the cultural diversity and distinctiveness of the microscopic resources and their use. It is significant to note that because there is no official taxonomic classification in the research community, confirming that the species are identical to those described in other studies is challenging. Additionally, it is possible that there are other edible species in the area besides the 17 different varieties of wild mushrooms.

It is common for men to collect mushrooms, but women are in charge of selling them; in this context, it was identified that the consumption of edible wild mushrooms has decreased (Figure 4). According to the mushroom's hunters, 40.0% of consumers believe that eating wild mushrooms contributes to the resource of forests degradation and the loss of biodiversity; 13.3% believe the difficulty in gathering wild mushrooms is to blame; 20.0% mentioned the lack of knowledge of the types of wild edible mushrooms; 20.0% attributes this to the consumption and introduction of junk food; and 6.7% to the high price of wild mushrooms. According to Ruan (2018), the consumption of mushrooms is an unsustainable type of forest exploitation that helps to sustainably feed and generate resources for local communities. In the same way, Garca and Thomé (2019) mention that consumption is organized, can generate resources for communities, and contribute to local development. Estrada and others (2009) support the hypothesis that selling these products at high prices will generate economic resources.

The art of good eating and drinking has changed as a result of the evolution of dietary habits in a globalized society. In this sense, the consumption and preparation of plates represent a “food habit” part of the culinary culture; a collection of rules and customary methods for choosing, preparing, and consuming foods (Mejia et al. 2014). According to that stated earlier, Bahls et al. (2009) mention that the culinary field of gastronomy is a refinement of cooking in which the middle- and upper-class Meridians separate dishes that, in their opinion, reflect the sophistication and globalism of society. In this regard, it is vital to have knowledge of the Xalatlaco community's cuisine, which promotes authenticity and culture, produced rationally based on traditional knowledge.

**Figure 4.** Factors Affecting the Consumption of Edible Mushrooms in Xalatlaco, Mexico.



## Use of Wild Edible Mushroom in Cooking

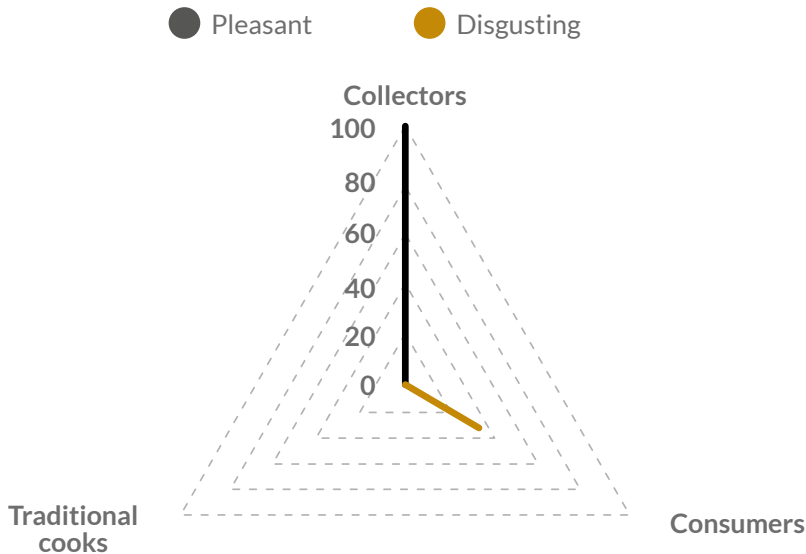
### Flavor Perception.

The perception of flavors is connected to the traditional knowledge that has been passed down from one generation to the next and is a part of food culture. Food consumption is an activity, where biological, social, cultural, economic, and political factors are intertwined ranging from the selection of food to its preparation (Noguera et al., 2017). According to the groups polled, the flavor of the EWM is what makes people eat or consume them (Figure 6); both traditional cooks and samplers thought the taste was pleasant. However, none of the groups mentioned a particular flavor. Instead, 66.6% of consumers described it as enjoyable and 34.4% as unpleasant. According to Cano and Romero, and Jasso et al. (2016), the use of mushrooms in human diets has become more prevalent because of their distinctive flavor and aroma. Jasso et al. (2019) state that the cultural importance of fungi is associated with nutritional value, because people with ethnomycological knowledge perceive fungi as a natural meat; they evidenced that in some mushrooms the taste is similar to the meat of chicken, charal (freshwater fish of the genus *Chirostoma*), or frog.

According to Cano and Romero (2016), the perception of meat taste is attributable to its chemical composition and nutritional value; generally, mushrooms contain 90% water and 10% dry matter. Protein comprises 27-48% of EWM, with carbohydrates (especially dietary fiber: D-Glucans, chitin and Pectic substances) adding up to approximately 60%. Lipids comprise 2-8% within which linoleic acid stands out. According to the authors, the high protein (15 to 35% of dry weight) reflects the belief that mushrooms are an effective substitute for meat, although not all wild fungi have this characteristic. It should be noted that fungi are an important source of minerals and antioxidants, such as phytoestersols; they are considered as functional foods (Cano & Romero, 2016). In this way, human beings have been accompanied by an evolution in nutrition that turns food into a cultural act, a more faithful expression of traditions of a people (Mejía et al., 2014).

The perception of flavors in a culture is inherited and preserved; however, this perception is dynamic and changes over time, not only in its physical and chemical elements, but also via social and cultural transformations (Mejía et al., 2014).

**Figure 5.** Cultural Perception of the Flavor of Edible Wild Fungus in Xalatlaco, Mexico.



Cuisines go beyond the consumption of local food, as they contain the social, cultural, and technical aspects, as well as the knowledge and culinary history (Brito & Botelho, 2018). The transmission of culinary knowledge was carried out by traditional chefs, usually at the time of the sale of mushrooms. In accordance with the Institute of Biology (2022) and Jasso et al. (2019) that mention that the transfer of ancestral culinary knowledge is granted at the time of its commercialization, and by older women. Ancestral culinary knowledge integrates a collective knowledge, it recognizes the taste and nutrition of mushrooms and evidences the diversity of productive activities that determine the conservation of biodiversity (Jasso et al. 2019).

Of the 17 varieties of mushrooms, seven types of preparation or culinary techniques (Table 1) were identified: stews, strong dishes, salted, roasted, filled tamales, *tlacoyos* and cheesecakes (entrées). Seventeen recipes of the traditional chefs were documented: entrées: pork ear quesadilla, egg quesadilla; roasted: mosaic puffball; blackening russula: stew of enchillados, *xocoyol* stews, fly amanita stews and agave stew; main dishes: *chilpaztle*, filled *mazorquita* and filled clustered coral; tamales: of fried chicken mushrooms tamal and *clavito* tamal; tacos: *pancita encebollada*; garnishes: *pancita encebollada*, and *pan de mosco*.

Other referred recipes were: green sauce tamales with carvings and pork meat, bread fungus quesadillas and cheese Oaxaca or cheese, broad beans *tlacoyos* with *clavitos*, cloves in green sauce with pork, filled clustered coral with *guajillo* sauce, *mazorquita* filled

with ground beef and red mole (Table 2). Alternatively, Jasso et al. (2019) identified 27 edible wild mushroom recipes according to their preparation. They were classified into nine groups: stews, main courses, quesadilla, peeled mushroom tortilla, mushrooms salad, fried or salted mushrooms, broad beans wraps and filled mushrooms.

**Table 1.** Culinary Use of Edible Wild Mushrooms in Xalatlaco, Mexico.

Common Name	Scientific Name	Availability	Culinary Techniques
Chilero	<i>Lactarius deliciosus</i>	July – November	Salted or stews.
Scaly Chanterelle	<i>Gomphus floccosus</i>	July – November	Salted or stews.
Clavito	<i>Entoloma lividoalbum</i>	July – November	Salted or stews, tamales and soups.
Pan de mosco	<i>amanita muscaria colors</i>	July – November	Salted or stews.
Pork ear or tolumbo	<i>Russula nigricans</i>	July – November	Salted or stews and in quesadillas.
Clustered coral	<i>Ramaria formosa</i>	July – November	Salted or stews, in tamales, filled and stews.
Fried Chicken mushroom	<i>Lyophyllum decastes</i>	July – November	Salted or stews, in soups and tamales.
Agave mushroom	<i>Ciuperclor Pleurotus</i>	July – November	Salted or stews and in quesadillas.
Huevito	<i>Calvatia utriformis</i>	July – November	Salted or stews.
Fly amanita or fly agaric	<i>Amuscaria colours</i>	July – November	Salted or stews.
Blackening russula	<i>Russula nigricans</i>	July – November	Salted or stews.
Xocoyol	<i>Laccaria laccata</i>	July – November	Salted or stews.
Morel	<i>Morchella esculenta</i>	July – November	Salted or stews, and stuffing.
Bread or panza	<i>Boletus loyo</i>	July – November	Salted or stews.
Mosaic puffball	<i>Calvatia utriformis</i>	July – November	Salted, stews and grilled.
Enchiladas	<i>Cantharellus friesii</i>	July – November	Salted or stews.



Common Name	Scientific Name	Availability	Culinary Techniques
Tejamanilero	<i>Clitocybe geotropa</i>	July – November	Salted or stews, in soups and tamales.

Recipes are a set of cooking knowledge; they are transmitted orally or in writing from generation to generation. This knowledge resides in the memory of the inhabitants, who will protect and transmit it; this ensures its permanence and extends its recognition as an identity factor (Mejía et al. 2014). For traditional Xalatlaco dishes, EWMs are the main ingredient based on recipes and culinary creations. This coincides with that expoused by Cano and Romero (2016). They documented that macromycetes are considered main ingredients of gourmet and traditional dishes, as well as excellent garnish in countless preparations.

**Table 2.** Recipes Based on Edible Wild Mushrooms from the Traditional Chefs of Xalatlaco, Mexico.

Common Name	Scientific name	Time of service	Name of the recipe	Ingredients
<i>Pork ear or tolumbo</i>	<i>Russula nigricans</i>	Starter	Pork ear quesadilla	Onions, serrano chili, salt or pork butter, epazote, garlic, corn tortilla or cheese.
<i>Huevito</i>	<i>Calvatia utriformis</i>		Quesadilla of huevito	
<i>Mosaic puffball</i>	<i>Calvatia utriformis</i>	Roasted	Roasted mosaic puffball	Salt and pork butter.
<i>Galletita</i>	<i>Russula nigricans</i>		Roasted galletita	

Common Name	Scientific name	Time of service	Name of the recipe	Ingredients
Enchilada	<i>Cantharellus fresii</i>	Soup, stews and creams	Soups of enchiladas	Onions, veins of chili pass, salt, <i>epazote</i> , garlic and water.
Xocoyol o xocoyotl	<i>Laccaria laccata</i>		Soup of xocoyol	Onions, <i>epazote</i> salt, garlic and water.
Fly amanita	<i>schrums</i>		Soup of fly amanita	
Agave mushroom	<i>Ciuperclor Pleurotus</i>		Soup of agave	Onions, salt, <i>epazote</i> , garlic, water, veins of chili pass and dry charal.
Tejamanilero	<i>Clitocybe geotropa</i>	Mains course	Chilpaztle	Onion stalk, salt, dried fish (popocha), dried charal, <i>epazote</i> , garlic and chilaca.
Mazorquitas	<i>Morchella esculenta</i>		Filled mazorquita	Onion, <i>jitomate</i> , salt, garlic, <i>epazote</i> and cheese.
Clustered coral	<i>Romaria formosa</i>		Filled escobetita	Onions, <i>jitomate</i> , salt, garlic, <i>epazote</i> , pork meat and egg.
Fried chicken mushroom	<i>Lyophyllum decastes</i>	Tamales	Tamales of fried chicken mushroom	Onions, salt, pig butter, <i>jitomate</i> , pork meat, serrano chili, nixtamalized corn mass and hydrated corn leaf.
Clavito	<i>Entoloma lividoalbum</i>		Tamales of clavitos	<i>Jitomate</i> , pork meat, serrano chili, nixtamalized corn mass and hydrated corn leaf.
Bread or panza	<i>Boletus loyo</i>	Tacos	Pancito encebollado	Onions, chili veins, salt, oil or pork butter, <i>epazote</i> and garlic.
Chilero	<i>Lactarius deliciosus</i>		Pancito encebollado	Onions, garlic, <i>epazote</i> , salt, oil or butter.
Scaly Chanterelle	<i>Gomphus floccosus</i>	Garnish	Cornetitas	Onions, serrano chili, salt, oil or pork butter, <i>epazote</i> , garlic and chilaca.
Pan de mosco	<i>Amanita muscaria colors</i>		Pan de mosco	Onions, salt, veins of pasilla chili, oil or pork butter, <i>epazote</i> and garlic.

Another finding linked with wild mushrooms was *La danza de los Tlaxinquis* or *Tejamanileros*. A theatre (dance of Pre-Hispanic Origin) with parliament in *náhuatl*, typical from the municipality of Xalatlaco, represents the living legend of wild mushrooms. *Otrora*, caregivers of the forest, promote the balance between the mankind and nature.

The story begins with a portrayal of the work undertaken by men in the forest at *El Cerro del Quepil*, (The Quepil mountain) the site where the first settlers established their community. This is a remarkable summit covered in branches, moss, and some edible wild mushrooms that are distinct features of the Mexican dance landscape. The main character in this story is *Cuajtlachane*, the lord of the forest, who is accompanied by the *Tlaxinquis*, the men of the forest. As part of a ritual of reverence and respect, Cuajtlachane sings to acknowledge the neighboring sites, while the Tlaxinquis dance around him. The dancers are attired in white blanket underpants, huaraches and hats and mushroom necklaces (commonly referred to as rosaries). The Tlaxinquis used to produce *tejamanil*, wooden sheets made from oyamel trees which gave the dance its name. These wooden sheets are still used as roofing material for houses in the village.

Presently, the local inhabitants continue to use mushrooms necklaces (also known as rosaries) to preserve them as a vital source of sustenance for their households, given that these mushrooms can only be harvested during the rainy season. The mushrooms used for this purpose include *clavitos* (*Entoloma lividoalbum*), *negritos* (*Lyophyllum decastes*), *mazorquitas* (*Morchella esculenta*) and *tejamanileros* (*Clitocybe gibba*). Once dried, these mushrooms are stored until a *Tlacualera* or traditional cook, uses them to prepare food. The larger edible wild mushrooms, which have a higher water content, are bartered for non-perishable foods, such as dried chili, charal, and dried fish (popocha). Once mushrooms have been cleaned and selected, bartering takes place in the village market which has been the traditional way of life for the forest caretakers.

While the dance is taking place, a broth called *chilpaztle* is prepared, believed to cure jaundice or weakness. The ingredients used to prepare chilpaztle broth are readily available and easily preserved. This broth is prepared with dried chiles, dried fish (popocha), dried charales, garlic, onions, epazote and EWMs harvested by the community's mushroom farmers as the main ingredient.

Toward the end of the dance, a wedding ceremony takes place, in which *Xoco*, the youngest son of the town marries *Sohualxoxóchitl*, the maiden. The ceremony is officiated by the *Cuajtlachane*, known as the lord of the forest, who presents the bride's traditional activities including making tortillas, grinding corn in a *metate*, and preparing sauces in a *molcajete*. As for the groom's part, he is tasked with making *tejamanil* and receives instructions on the duties he will assume from now on as a man of the forest. At the end of the wedding ceremony, the Cuajtlachane presents his "son" with a piece of *tejamanil* and all the necessary ingredients for

preparing the *tlaxinque* or chilpaztle broth. As part of the ceremony, the lord of the forest dances with the ingredients, in full view of all the local inhabitants, as a gesture of sustenance for the community. At the end of the dance, the Tlacualera and the Tlaxinquis distribute the food prepared with the locally-harvested herbs, seeds, vegetables, and mushrooms. Afterward, the chilpaztle broth is shared as a symbol of the community's harmony with the forest and continued reliance on its sustaining resources.

The dance-theater performances of the Tlaxinquis comprise three movements. The first depicts the arrival and settlement of the earliest inhabitants along with their veneration of local deities and the surrounding hills as sources of sustenance. Paoli (1991) argued that the migration to *Las Cruces* in the central mountain range, which is now known as the municipality of Xalatlaco, located at an altitude of 2,700 meters above sea level, was a logical consequence of the conquest of the Mexican Empire in 1476, as settlers from the great city moved southeast to the Toluca Valley. The religious and mythical significance of the dance is enhanced in the personification of El Cerro del Quepil. In Mesoamerican cultures, hills were honored as sacred entities believed to protect and benefit the population, and the worship of these entities is shown in the dance (Jarquín, 2011). According to the world view of ancient Mexico, the *Cuajtlachane* plays the role of representing the highest deity, while the Tlaxinquis are believed to represent trees which were seen as men with rational souls in past life (González, 2015).

The second part of the performance can be understood as entailing family life, daily work, food, and the preservation of life. The dance-theater performances intertwine the mythical and everyday aspects with the EWM serving as the core of the ceremony. The religious practices in Mesoamerican culture are commonly associated with the cultivation of corn which is the basis of Mexican cuisine. Religious festivals and ceremonies are often timed to coincide with the phenological stages of the corn crop (González, 2015). "The Dance of the Tlaxinquis" is traditionally performed during the summer solstice, a time when the onset of rainfall indicates the beginning of mushroom production which is the source of sustenance and livelihood for the forest caretakers.

The concluding part of the dance ceremony encompasses expressions of appreciation, elation, and wealthiness. This celebratory symbol creates an immersive atmosphere that depicts wealth, generosity, resilience, companionship and community trust (Paoli, 1991). The symbolic collective dance and the consumption of chilpaztle broth serve to contemporize a shared history rooted in the culinary arts and flavors, thereby asserting the community's identity and ethnic heritage. According to González (2015), "The dance of Tlaxinquis" represents a form of resistance against the loss of cultural identity and helps to affirm the community's values, nourishing the spirit and preserving the living memory of the community.

## Conclusions

The municipality of Xalatlaco finds itself located within a globalized world where it must struggle between ancient and modern ways of life. Nonetheless the community manages to preserve its traditional knowledge through the efforts of mushroom growers and cooks who are the repositories of the past. Gastronomy as well as artistic and religious representations serve to reaffirm the community's identity and ethnic origins.

Gastronomy interweaves a complex set of symbolic systems and faithfully reflects its culture, thus being a meaningful aspect of intangible cultural heritage. The knowledge of mushrooms including their harvesting, consumption, and preparation is an inherited process, with women playing a critical role in safeguarding and transmitting this culinary tradition. However, globalization has had the harmful effect of changing consumers' eating habits, and a generational shift has led to a loss of culinary skills and knowledge. Despite this, mushroom growers and cooks preserve the identification of EWM. The latter group maintains the culinary cultural heritage of preparing EWM through their recipes.

Similarly, "The dance of Tlaxinquis," the use of EWM in the dancers' rosaries and the performance of *El Cerro del Quepil* all serve to preserve living memory, traditional and collective culinary knowledge as cultural heritage. These are symbolic of sustenance and livelihood. Meanwhile, the chilpaztle broth, the town's signature culinary dish, serves as a reminder of the cultural exchange between ethnic groups in the Toluca Valley, as it incorporates dried fish into the main dish. The addition of new ingredients to traditional culinary techniques contributes to the know-how of traditional cuisines. Therefore, chilpaztle broth is an identifying symbol of Xalatlaco's gastronomy.

Mycophagy, or the consumption of EWM, has been and continues to be the foundation of Xalatlaco's gastronomy in the State of Mexico. As such, the sustainable management, the revaluation of traditional knowledge, and the preservation of food culture must be the core of the regional gastronomy.

## References

Arteaga, M. B. y Moreno, Z. C. (2006). Los hongos comestibles silvestres de Santa Catarina del Monte, Estado de México. *Revista Chapingo. Serie*

*Ciencias Forestales y del Ambiente*, 12(2), 125-131. <https://www.redalyc.org/pdf/629/62912205.pdf>

- Bahls, Á., Wendhausen K., R. y da Silva A., E. (2019). Comprensión de los conceptos de culinaria y gastronomía. Una revisión y propuesta conceptual. *Estudios y perspectivas en turismo*, 28, 312-330. <https://www.redalyc.org/journal/1807/180760431004/html/>
- Brito, L. M. y Botelho, D. (2018). La gastronomía como marca de destino: Proposiciones en Minas Gerais - Brasil. *Estudios y Perspectivas en Turismo*, 27(2), 390-412. <https://www.redalyc.org/journal/1807/180755394012/html/>
- Burrola, A. C., Montiel, O., Garibay, O. R. y Zizumbo, V. R. (2012). Conocimiento tradicional y aprovechamiento de los hongos comestibles silvestres en la región de Amanalco, Estado de México. *Revista Mexicana de Micología*, 35(2), 1-16. <https://www.redalyc.org/articulo.oa?id=88325120004>
- Cabrera, P. L., Bethencourt, B. J., González, A. M. y Álvarez, P. P. (2006). Un estudio transversal retrospectivo sobre prolongación y abandono de estudios universitarios. *RELIEVE. Revista Electrónica de Investigación y Evaluación Educativa*, 12(1), 105-127. <https://ojs.uv.es/index.php/RELIEVE/article/view/4241>
- Cano, E.A. y Romero, B. L. (2016). Valor económico, nutricional y medicinal de hongos comestibles silvestres. *Revista chilena de nutrición*, 43(1), 75-80. <https://dx.doi.org/10.4067/S0717-75182016000100011>
- Ceron, G. M., Santos, L. E., Sánchez, O. I., Rangel, V. E., Rodríguez, Á. J. e Ibarra, O. I. (2020). Hongos comestibles: Un ingrediente alternativo en la formulación de productos cárnicos. *Pädi Boletín Científico de Ciencias Básicas e Ingenierías del ICIB*, 7(14), 47-50. <https://www.semanticscholar.org/paper/Hongos-comestibles%3A-Una-alternativa-saludable-en-Ceron-L%C3%B3pez/c95ca09d566ff5b1880294eeced5df3a8f69940>
- Cifuentes, B. J., Villegas, R. M. y Pérez, R. L. (1986). Técnicas especiales de recolección y preparación de ejemplares de grupos selectos de plantas: hongos. En A. Lot, y F. Chiang (Ed.), *Manual de herbario* (pp. 55-64). Consejo Nacional de la Flora de México.

- Cuesta, C. J. y Santamaría, R. N. (13 de enero de 2012). *Cantharellus friesii*. Blog REDFORESTA. Red Social de los Profesionales del Medio Natural.
- Elorza, P-T. H. (2008). *Estadística para las Ciencias Sociales, del comportamiento y de la salud*. Cengage Learning Editores S. A.
- Estrada, M. E., Guzmán, G., Cibrián, T. D. y Ortega, P. R. (2009). Contribución al conocimiento etnomicológico de los hongos comestibles silvestres de mercados regionales y comunidades de la Sierra Nevada (México). *Interciencia*, 34(1), 23-33. <https://www.redalyc.org/articulo.oa?id=33934104>
- Fierro, M. J., Salinas, J., Lera, L., González, C. Gloria y Vio del Río, F. (2019). Efecto de un programa para profesores sobre cambio de hábitos alimentarios y habilidades culinarias en escuelas públicas de Chile. *Nutrición Hospitalaria*, 36(2), 441-448. <https://dx.doi.org/10.20960/nh.2190>
- García, S. M. del C., Viveros A. L. J., Flores E, M., Carreño L. R., Munguía P. R. y Santiesteban, N. A. (2019). Etnomicrología de la Sierra Nevada. *RD-ICUAP*, 5(15), 1-13. [https://www.researchgate.net/publication/348603726\\_ETNOMICOLOGIA\\_DE\\_LA\\_SIERRA\\_NEVADA\\_ETHNOMICOLOGY\\_OF\\_SIERRA\\_NEVADA](https://www.researchgate.net/publication/348603726_ETNOMICOLOGIA_DE_LA_SIERRA_NEVADA_ETHNOMICOLOGY_OF_SIERRA_NEVADA)
- García, S. E. y Thomé, O. H. (2019). La dimensión recreativa de los hongos comestibles silvestres de Senguio Michoacán, México, y sus escenarios de desarrollo local. *Agroproductividad*, 12(5), 45-50. <https://doi.org/10.32854/agrop.v0i0.1402>
- Garibay, T. F., Altamirano, G. C., Huerta, G. J. y Hernández, G. S. (2018). Cuatro productos ancestrales y su importancia en la gastronomía mexicana. *Kikame: El que viaja*, 6(6), 16-19. <https://core.ac.uk/download/pdf/268579667.pdf>
- González, M. A., Rivas, A. R. y Burrola, A. C. (2021). Actividad antioxidante de hongos silvestres consumidos tradicionalmente en el centro de México. *SCIENTIA FUNGORUM*, 52, 1-10. <https://www.scientiafungorum.org.mx/index.php/micologia/article/view/1410/1523>
- González, M. S. (2015). Ritual, memoria e identidad de los nahuas contemporáneos; Las danzas de hacienda, de Xalatlaco, Estado de México. En E. C. Good, & R. Dominique (Ed.), *Múltiples formas de ser nahuas. Miradas antropológicas, hacia representaciones, conceptos y prácticas* (págs. 1-22). El colegio de Michoacán.

- Hernández, S. R., Fernández, C. C. y Baptista, L. P. (2014). *Metodología de la investigación*. Mc Graw Hill. Instituto de Biología, UNAM. (2022, 22 de noviembre). Hongos silvestres comestibles y tóxicos de México. <https://www.hongoscomestiblesytoxicos.ib.unam.mx/index.html>
- Jasso, A. X., Martínez, C. A. y Dorantes, C. E. (2019). Más allá de la comercialización de hongos comestibles silvestres en la comunidad de San Antonio Acahualco, México. *Agroproductividad*, 12(5), 9-16. <https://www.semanticscholar.org/paper/Hongos-comestibles%3A-Una-alternativa-saludable-en-Ceron-L%C3%B3pez/c95ca09d566ff5b1880294eeced5df3a8f69940>
- Jarquín, M. T. (2011). El alma del Xinantécatl. Pervivencia de ritos indígenas en el Valle de Toluca. A propósito de la obra de Jacinto de la Serna. *Estudios De Cultura Otopame*, 6(1), 89-100. <https://revistas.unam.mx/index.php/eco/article/view/23982>
- Jiménez, R. A., Thomé, O. H., Espinoza, O. A. y Vizcarra, B. I. (2017). Aprovechamiento recreativo de los hongos silvestres: caso de micoturismo en el mundo con énfasis en México. *Bosque*, 38(3), 447-456. <https://biblat.unam.mx/es/revista/bosque-valdivia/articulo/aprovechamiento-recreativo-de-los-hongos-comestibles-silvestres-casos-de-micoturismo-en-el-mundo-con-enfasis-en-mexico>
- Malacara M, C. (2019). *Caracterización química, farmacológica y evaluación del potencial antioxidante de los hongos comestibles silvestres: Yema (Amanita caesaria), Venado (Amanita varginata var punctata), Juan Diego (Amanita Rubecens), Oreja (Clytocibe gibba), Xocoyotl (Lacca)*. Universidad Autónoma de la Ciudad de México.
- Martínez, H. J., Váldez, P. M. y Arriaga, J. C. (2019). Recolección de hongos comestibles silvestres en el contexto de pastoreo de alta montaña en la localidad de Agua Blanca en el Nevado de Toluca, México. *Agroproductividad*, 12(5), 17-23. <https://revista-agroproductividad.org/index.php/agroproductividad/article/view/1399>
- Mejía, L. S., Bravo, M. y Mejía, C. S. E. (2014). La gastronomía como símbolo en la cultura. *Culinaria*, 7(1), 50-64. <https://docplayer.es/18108972-La-gastronomia-como-simbolo-en-la-cultura-lina-sarai-mejia-lopez-miriam-bravo-rodriguez-sonia-edith-mejia-castillo.html>



- Molina, C. S., Thomé, O. H. y Espinoza, O. A. (2019). Conocimiento ecológico tradicional y aprovechamiento de los hongos comestibles silvestres en el centro de México. *Agroproductividad*, 12(5), 3-8. <https://doi.org/10.32854/agrop.v0i0.1395>
- Naturalista. (20 de noviembre de 2022). *Hongos, Romaria formosa*. [https://www.naturalista.mx/taxa/48770-Ramaria-formosa/browse\\_photos](https://www.naturalista.mx/taxa/48770-Ramaria-formosa/browse_photos)
- Noguera, M. N., Ojeda, O. L., Pérez, Y. L., Martínez, F. y González, D. (2017). Factores asociados a la compra y el consumo de hortalizas en la parroquia de Santa Rita, Municipio Francisco Linares Alcántara, Estado Arauca. *Comunidad y Salud*, 15(2), 40-48. <https://www.redalyc.org/pdf/3757/375754623006.pdf>
- Orozco, M. E., Valdés, M. E., Álvarez, G. y Morales Sánchez, D. (2018). Apropiación social de la masa combustible: Análisis de, l estado. *Revista Iberoamericana de Ciencias*, 5(3), 67-80. <https://ri.uaemex.mx/handle/20.500.11799/94543?show=full>
- Padilla, M. F. (2020). La cocina tradicional. Consideraciones sobre su vigencia a partir del contraste entre su presencia en el pasado y en el presente. *Convergence, Tech. Revista científica*, 4(1), 11-14. <https://revista.sudamericano.edu.ec/index.php/convergence/article/view/29>
- Paoli, A. (1991). Identidad y utopía en las fiestas de Xalatlaco. *Argumentos*, 14, 99-112. <https://argumentos.xoc.uam.mx/index.php/argumentos/article/view/833/829>
- Pinzón, J. P., De la Fuente, J. y Uitzil-Colli, M. O. (2021). Los hongos silvestres comestibles de la península de Yucatán. *Desde el Herbario CICY*, 13, 102-109. [https://www.cicy.mx/Documentos/CICY/Desde\\_Herbario/2021/2021-05-27-Pinzon\\_et\\_al.Hongos\\_silvestres\\_comestibles\\_de\\_la\\_peninsula\\_de\\_Yucatan.pdf](https://www.cicy.mx/Documentos/CICY/Desde_Herbario/2021/2021-05-27-Pinzon_et_al.Hongos_silvestres_comestibles_de_la_peninsula_de_Yucatan.pdf)
- Reyes, A. C., Guerra E. A. y Quintero, J. M. (2017). Educación en gastronomía: su vínculo con la identidad cultural y el turismo. *El Periplo Sustentable*, (32), 1-23. <https://www.redalyc.org/articulo.oa?id=193462120009>
- Ruan, S. F. (2018). Recolección de hongos comestibles silvestres y estrategias para el reconocimiento de especies tóxicas entre los tsotsiles de Chamula, Chiapas,

México. *SCIENTIA FUNGORUM*, 48, 1-13. <https://scientiafungorum.org.mx/index.php/micologia/article/view/1179>

Triviño, A. D. y Forero, M. S. (2019). *La gastronomía mexicana como parte de la identidad de su marca país*. CRAUSTA. Centro de recursos para el aprendizaje y la investigación. <https://repository.usta.edu.co/handle/11634/15457?show=full>