

**The Role of Psychoactive Substances as  
Entheogens and Medicines in  
Pre-Columbian Mexico.**

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**ABSTRACT:**

Powerful psychoactive substances were used for both entheogenic and medicinal purposes in pre-Columbian Mesoamerica, and their use was meticulously documented by early colonial chroniclers seeking to understand the New World. For example, *Lophophora williamsii* contains relatively high concentrations of an incredibly powerful psychedelic alkaloid in mescaline (today a Schedule I controlled substance). The cactus was, however, more revered in ancient Mesoamerica as a stimulant and panacea, with its powerful visions considered a secondary desire.

The aim of this dissertation has been to build a multi-disciplinary catalogue of pre-Columbian psychoactive medicines and investigate their medicinal and ritual significance. A plant template was designed that would both successfully answer the research questions, and provide a useful reference tool for future ethnopharmacological and Ancient Mesoamerican research. New examples of psychoactive-related artefacts discovered on fieldwork have been included, and new theories on old identifications have been proposed. The dissertation's catalogue addresses the research questions posed and serves as an up-to-date reference point for future studies into native psychoactive plants of Mexico. Recommendations were made for the further cataloguing of Mexico's native psychoactive plants and their historic use.

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*"I declare that this dissertation is my own work and that all sources have been appropriately acknowledged. This dissertation comprises 11,944 words of main text."*

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## 1. Introduction

Upon discovering what he thought was the West Indies, Christopher Columbus immediately wrote back to King Ferdinand II's finance minister, Luis de Santángel, recounting the foreign lands he had witnessed on his voyage. In doing so, Columbus began what would be a long tradition of documenting and explaining the flora and fauna of the New World. More formal and focussed attempts to account for life in New Spain followed after the conquest of Tenochtitlan, capital of the Aztec empire. These efforts were principally under the guises of, most notably in Mexico, Franciscan friar Bernardino de Sahagún, Diego Durán and Francisco Hernández. Sahagún's Nahuatl masterpiece of ethnography, *The Florentine Codex*, affirmed his place as the father of American ethnography, and it is there where this dissertation finds its roots.

Building from Sahagún's work, the aim of this dissertation is to collate, critique and supplement the evidence that exists surrounding the medicinal and entheogenic uses of native psychoactive plants in pre-Columbian Mexico. To do this, a catalogue of psychoactives specific to pre-Columbian Mesoamerica has been created. The catalogue aims to answer the proposed research questions regarding native psychoactives, and additionally function as a powerful reference tool for future studies on entheogens in the fields of Mesoamerican Studies, ethnopharmacology and ethnobotany.

## 2. Literature Review

In creating a catalogue of psychoactive entheogens and medicines used in pre-Columbian Mesoamerica, it was imperative to review the current academic literature on what is a multidisciplinary subject. This research project has its roots in the reality that there is no modern reference catalogue of psychoactive plants used for **both** entheogenic and medicinal purposes focussed on pre-Columbian Mesoamerica.

Due to the lack of literature that is wholly within this dissertation's scope, the primary purpose of this literature review is to identify and analyse sources that pertain to the plant subheadings covered in this catalogue, which have been based on the research questions.

For example, in studying Aztec health and medicine, one of the definitive publications in the field is Bernard Ortiz de Montellano's *Aztec Medicine, Heath, and Nutrition*. For ethnopharmacological research related to psychoactive plants, Christian Rätsch's unparalleled *The Encyclopedia of Psychoactive Plants: Ethnopharmacology and Its Applications* needed to be reviewed. Other literature pertaining to specific psychoactives in ethnobotany includes the corpus of papers written by Richard Evans Schultes.

*Plants of the Gods* by Richard Evans Schultes and Albert Hofmann was a milestone in ethnobotany and is devoted to the use of hallucinogenic plants on a global scale. The book draws immensely from their own published research which pioneered ethnobotanical studies on psychoactive substances in the 20<sup>th</sup> century. Indeed, it was the collective publications of both Schultes and Hofmann that inspired this research project.

Due to the global scope of their book, it lacks a great depth and focus on ancient Mesoamerican psychoactives. The authors instead chose to focus on the contemporary use of these plants by indigenous populations, such as the Huichol, and their traditional and ceremonial backgrounds. *Plants of the Gods* was an excellent primer as it contains a thorough list of psychoactive plants, with descriptions, taxonomical names, psychoactive alkaloids and ritual uses.

Peter A.G.M de Smet's *Ritual Enemas and Snuffs in the Americas* was a useful piece of literature in researching the ritual aspect of this dissertation. De Smet's scope is

incredibly specific, focussing on enemas and snuffs, but also covers an immense geographic and temporal range. The publication functions as an essential source for information pertaining to traditional enema application, something that was sometimes lacking in detail in other ethnopharmacological literature.

The most extensive ethnopharmacological publication focussed on psychoactives is Christian Rätsch's *The Encyclopedia of Psychoactive Plants: Ethnopharmacology and Its Applications*. The encyclopaedia impressively covers every known psychoactive plant and their derivatives, and greatly expands on Schultes and Hofmann's pioneering studies. It is a magnum opus of ethnopharmacology which this research project has benefitted from immensely. Due to Rätsch's meticulous and holistic interdisciplinary approach on the contemporary and historic use of psychoactive plants, it is certain that future studies will also benefit from this encyclopaedia. The encyclopaedia is by no means dedicated to collating the pre-Columbian Mesoamerican use of native psychoactives, as this catalogue is. It did, however, function as a strong schematic base and reference point in the creation of this research catalogue.

Jan G.R. Elferink has produced a number of short journal articles that focus more directly on psychoactive plant use in the Aztec Empire. Elferink's eight-page paper, *Some Little-Known Plants of the Aztecs* (1988) focuses, with limited success, on cataloguing as-then unidentified Nahuatl names with taxonomical equivalents. Elferink's publications were helpful in the early stages of identifying which plants would be included in this catalogue.

Peter T. Furst's 1972 *The Flesh of the Gods* and the newly published *Sueño y éxtasis: vision chamánica de los nahuas y los mayas* by Mercedes de la Garza both cover the shamanistic use of psychoactive plants. Shamanism can be interpreted as a synthesis between the spiritual and the medicinal use of hallucinogens. This catalogue has sought to keep the two concepts mostly divided in its subheadings, instead citing the plants' separate functions.

*Flesh of the Gods* dedicates two chapters to the use of two psychoactive plants and fungi from Mexico; peyote and *teonanácatl*. Like others who have studied the traditional use of peyote, there is a large focus on the rituals of present-day Huichol tribes in Mexico.

The two chapters were valuable in comparing the Mexican shamanic use of psychoactives to other cultures around the globe.

Mercedes de la Garza focuses on shamanic visions in pre-Columbian Mesoamerica. *Sueño y éxtasis* differentiates between altered consciousness (visions) provoked by psychoactive substances and the concept of shamanic dreaming. The publication contains examples of artefacts, principally Mayan vases, which display shamanic visions. There is also an excellent appendix that contains a table of psychoactive plants, their basic functions, and the key primary sources that mention them. *Sueño y éxtasis* was an excellent source, which reaffirmed that I had been consulting the correct primary material, while also providing examples the type of artefacts associated with entheogens.

Bernardino de Sahagún was the pioneer of the ethnography of Mesoamerican civilisation and Mexican botany. In Book 11 of *The Florentine Codex* he meticulously details the names and supposed pre-Conquest uses of the known flora and fauna in New Spain. The descriptions, in Nahuatl, are all accompanied by illustrations that display an early fusion of European and Mexica artistic styles.

A great deal of the *Florentine Codex's* information was derived from Nahuatl oral history and gathered a generation after the fall of Tenochtitlan. The caveats of oral histories are well known; there is always the possibility of slight embellishments, forgotten details or even misinterpretations. Indeed, in Book 11 alone there are a number of taxonomical misnomers, but that does not significantly detract from its value as a primary source.

A common concern expressed regarding colonial-era religious sources, such as Sahagún, is the potential for an overly evangelical Catholic bias to obfuscate the truth. Book 11, however, is largely a catalogue of the flora and fauna of New Spain, so there is little space for European influence. One example includes an illustration of a clawed, beaked demon atop a *Psilocybe mexicana* mushroom [Figure 1]. Bernard Ortiz de Montellano has claimed that, for religious reasons, Sahagún deliberately omitted plant treatments for “aquatic fever” (possibly malaria) because of its association with “the Tlaloc Complex” and therefore divine causation.<sup>1</sup> Additionally, the said cure for “hot” or “cold” fevers caused by

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<sup>1</sup> B.R. Ortiz de Montellano, *Aztec Medicine, Health, and Nutrition*, Rutgers University Press, New Brunswick, 1990, p. 158



deities was to directly contact the gods through the ingestion, rather than topical application, of entheogens such as *teonanácatl* and peyote.



Figure 1: Bird spirit of hallucinogenic vision, or Catholic inference of demonic possession? Florentine Codex, Book 11.

For gaining a foundation of Aztec conceptions of the human body and its perceived functionality, Ortiz de Montellano's *Aztec Medicine, Health, and Nutrition* (1992) and Alfredo López Austin's *Human Body and Ideology: Concepts of the Ancient Nahuas* (1988) are essential reading. Both of these books provided a strong background to understanding the Aztec world view and its relation to their perceptions of health.

The work of Spanish protomedico Francisco Hernández de Toledo was the most important primary source material on the medicinal applications of psychoactive plants for this dissertation. Indeed, if one is seeking to write about Mesoamerican plant use, any potential research would be incomplete without having consulted Hernández's 16<sup>th</sup> century *Historia de las Plantas de la Nueva España*.

Listed under the Nahuatl names and early taxonomy, the *Historia* contains a wealth of Aztec *materia medica* alongside detailed floral illustrations. There is a small element of religious bias present in *Historia* but never taints the traditional medical uses. As a pure medicinal catalogue of plants it is an invaluable early post-Conquest source. This research alternated between the printed 1943 Spanish edition of the book, and a scanned and indexed version hosted on UNAM's website.<sup>2</sup>

<sup>2</sup> Instituto de Biología, UNAM, '*Historia de las Plantas de Nueva España*,' 2004-2010. Last accessed 30/08/13, <http://www.ibiologia.unam.mx/plantasnuevaspana/>

The Badianus Manuscript of 1552, also known as *Libellus de Medicinalibus Indorum Herbis*, was originally created in Nahuatl at the Colegio de Santa Cruz de Tlatelolco and translated into Latin by Juan Badiano. The work was left untouched in the Vatican Library until its discovery in 1929. Since then there have been two notable English examples - Emily W. Emmart (1940) and William Gates (1939 & 2000). The herbal manuscript focuses primarily on the treatment of medical afflictions. Each affliction includes a descriptive treatment detailing the plants and materials required, alongside floral illustrations. Of the psychoactive plants studied in this dissertation, only *Datura* spp. and *Nicotiana rustica* were found. Nevertheless, *The Badianus Manuscript* is a rare source originally produced by Nahuatl students.

As there is currently no modern catalogue dedicated to the use of psychoactive plants as medicines and entheogens in Mesoamerica, the intention of the literature review was to evaluate the sources that correspond to the dissertation's subheadings. Ethnopharmacological works, such as Ratsch's encyclopaedia, are perhaps the closest to how this catalogue is structured; though they lack the specific temporal and geographic focus of this dissertation.

### 3. Methodology

The research undertaken in this dissertation has been largely qualitative. I have followed an ethnomethodology, and a great deal of information has come from ethnographic and ethnohistorical sources. In creating a catalogue that reflects both the pre-Columbian and modern understandings of psychoactive plants, I made use of qualitative research that exists in the field of ethnopharmacology. By its very nature ethnopharmacology is multidisciplinary, so from the outset this research project required an early understanding of key terminology used in the fields of botany, pharmacology and medicine.

In deciding which plants to include into the catalogue, I consulted existing literature to find out the most prominententheogens native to Mexico. One of the key determiners of which plants I would focus my research on was the statue of Xochipilli, god of flowers, dance and song, that was found on the foothills of Popocatepetl [Figure 11]. This statue features a number of psychoactive plants and their taxonomy has been a matter of debate. I decided to focus on the following plants in detail: *Turbina corymbosa*, *Lophophora williamsii*, *Psilocybe mexicana Heim*, *Datura spp.*, and *Nicotiana rustica*.

Having identified the plants, I needed to determine which subheadings would be most appropriate for answering my research questions, while still creating a useful Mesoamerican ethnopharmacological catalogue. The research questions I decided upon were:

- What are the most prominent nativeentheogens? Describe what makes thementheogens.
- What evidence of psychoactive substance use exists from pre-Columbian Mexico?
- What do the ethnographers report on the ritual and medicinal uses of psychoactive plants?
- How closely related are the rituals uses and medicinal applications of psychoactive plants by contemporary tribes to those of pre-Columbian civilisations?

- How culturally significant were the plants? Cite key artefacts and codices, where possible.

To answer these questions I decided on the following subheadings: **‘Sahagún’** (Plant description from *Florentine Codex, Book 11*, to put the plant in its ethnographic and pre-Columbian context), **‘description’**, **‘distribution’**, **‘Nahuatl names’**, **‘other names’**, **‘psychoactive components’**, **‘dosage’** (primarily as an entheogen), **‘medicinal uses’**, **‘ritual associations’**, **‘associated deities’**, and **‘archaeological evidence’**.

The ‘description’ and ‘names’ subheadings were included to dispel confusion where plants have been attributed several Nahuatl names and taxonomical misnomers, thereby avoiding the same difficulties that this research encountered.

The ‘psychoactive components’ and ‘dosage’ subheadings are intended to show what makes the plant psychoactive, and thereby a possible entheogen, and how it could have been prepared and applied in medicinal and ritual contexts.

The ‘medicinal uses’, ‘ritual associations’ and ‘associated deities’ subheadings contain the ethnographic and ethnohistorical research that is primary in answering this dissertation’s stated research questions. ‘Archaeological evidence’ relates to the final research question.

The research began with a thorough **literature review** (above) of all of the prominent sources in the various fields most likely to answer the research questions, and at the same time fill in the catalogue’s subheadings with useful information. Primarily being a qualitative research project, this was the largest research concern.

To complete the ‘archaeological evidence’ sections, a survey of current archaeological catalogues and published journals was made to find representations of each plant. In order to identify new artefacts, and to investigate the possibility of organic psychoactive plant matter found in ongoing excavations, a 10-day fieldwork trip to Mexico was undertaken in May 2013.

Fieldwork consisted of the following:

- 1) An investigation of the archaeological storerooms and museum at Zultepec in an effort to identify and photograph any unstudied artefacts.
- 2) A meeting with the director of the *Proyecto Templo Mayor* and leading archaeologist, Dr. Leonardo López Luján. Questions regarding recent finds and the possibility of identifying psychoactive organic material were fielded. A tour of the ongoing excavation was also provided by Dr López Lujan.
- 3) A meeting with Jaime Echeverría García, author of a newly published book which explores madness caused by psychoactive substances in ancient Mexico.<sup>3</sup>
- 4) Visit to the museum and ruins at Teotihuacan, site where the mural of the Great Goddess was discovered.
- 5) Investigation and photography of entheogenic imagery in artefacts displayed at the Museum of Anthropology (MNA), Mexico City.
- 6) Visit to the Museo de Arte Popular, Mexico City, to study and photograph traditional Huichol artworks.

The information gathered on fieldwork was then processed, and attempts to prove new plant imagery were made.

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<sup>3</sup> See J. Echeverría García, *Los locos de ayer*, Instituto Mexiquense de Cultura, Toluca, 2012.

#### 4. Plant catalogue: Data Gathering, Analysis & Discussion

##### i) Ololiuqui (*Turbina corymbosa*)



Figure 2 *Turbina corymbosa* flowers, erowid.org, 2000.

##### Sahagún:

“Its leaves are slender, cord-like, small. Its name is *ololiuqui*. It makes one besotted; it deranges one, troubles one, maddens one, makes one possessed. He who eats it, who drinks it, sees many things which greatly terrify him. He is really frightened [by the] poisonous serpent which he sees for that reason. He who hates people causes one to swallow it in drink [and] food to madden him. However, it smells sour; it burns the throat a little. For gout, it is only spread on the surface.”<sup>4</sup>

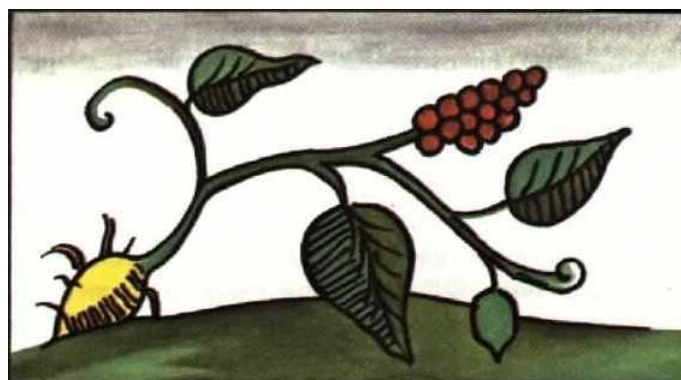


Figure 3: Illustration of *Turbina corymbosa*, Florentine Codex, Book 11.

<sup>4</sup> B.D. Sahagún, *Florentine Codex*, Book 11, University of Utah, Santa Fe, 1963, p. 129.

**Description:**

*Turbina corymbosa* is a large, woody species of morning glory that grows up to 8 metres long, “creeping” and climbing. It has largely white-and-yellow funnel-shaped flowers.

**Distribution:**

Native to Mexico and Central America, it has spread throughout Cuba where its nectar is used for honey.

**Nahuatl names:**

Coatxihuitl (“snake plant”) and coatlxoxouhqui (“green/blue snake”).<sup>5</sup> “Snake” presumably refers to the plant’s climbing vines; however, it may well refer to serpent visions induced by the plant, as described by Sahagún. Ololiuqui can refer to the **seeds** of a variety of plants, of which only *Turbina corymbosa*’s has psychoactive components. Ololiuqui translates as “that which causes turns”,<sup>6</sup> and “round thing” – presumably in relation to the seeds.

**Other names:**

Christmas vine, morning glory seeds, *Rivea corymbosa* (syn), xtabentún (Maya - an alcoholic beverage of the same name is reportedly made with *Turbina* nectar).

**Psychoactive components:**

The psychoactive material is most commonly consumed through ololiuqui seeds, however, the leaves and roots also contain psychoactive substances. The hallucinogenic compounds are lysergic acid alkaloids – lysergic acid amide (ergine/LSA) and lysergic acid hydroxyethylamide. LSA is related to lysergic acid diethylamide (LSD), however, LSA is approximately 100 times less potent.<sup>7</sup>

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<sup>5</sup> C. Rättsch, *The Encyclopedia of Psychoactive Plants*, Park Street Press, Rochester, 2005, p. 514.

<sup>6</sup> Ibid.

<sup>7</sup> R.E Schultes, A. Hofmann, C. Rättsch, *Plants of the Gods*. Rochester: Healing Arts Press, 2001, p. 171.

**Dosage:**

LSA has an active hallucinogenic dose of 2-5mg, the number of seeds required to achieve this dosage is, however, imprecise. According to Wasson, the “traditional” quantity of seeds consumed was between 14 and 22 seeds.<sup>8</sup>

**Medicinal uses:**

The pre-Columbian medicinal applications of ololiuqui appear to be wide and varied. Like other native hallucinogens, an ointment of it was applied topically to relieve gout and was ingested to treat “aquatic fever”.<sup>9</sup>

Hernández described its medicinal properties thus:

**“..it banishes chills and stimulates and aids in a remarkable degree in cases of dislocations, fractures, and pelvic troubles of women. The seed has some medicinal use. If pulverized or taken in a decoction or used as a poultice on the head or forehead with milk and chilli, it is said to cure eye troubles. When drunk, it acts as an aphrodisiac.”<sup>10</sup>**

He is presumably referring to *Turbina corymbosa* leaves in aiding bone injuries, rather than the seeds – as discussed, both contain psychoactive alkaloids.

**Ritual associations:**

Ololiuqui was one of the principalentheogens of the Aztecs, and its ritual use is well documented by colonial chroniclers. According to Hernández, priests would eat “the plant” to induce a delirium that would allow them to communicate with the gods – which he added were “satanic hallucinations.”<sup>11</sup> Ololiuqui was also slipped into food and drink by malevolent “sorcerers” intent on harming their enemies with the plant’s hallucinogenic, “maddening” properties.<sup>12</sup>

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<sup>8</sup> Gordon Wasson, ‘Ololiuqui and the other hallucinogens of Mexico’. In *Homenaje a Roberto J. Weitlaner*, UNAM, Mexico City, p. 343.

<sup>9</sup> “Aquatic fever” reportedly has similar symptoms to malaria. See: Ortiz de Montellano, op. cit., p. 158.

<sup>10</sup> Hernandez, Book II, p. 225.

<sup>11</sup> Ibid.

<sup>12</sup> Jan GR Elferink, et al., ‘The Use of Plants and Other Natural Products for Malevolent Practices Among the Aztecs and Their Successors’, *Estudios de Cultura Nahuatl*, vol. 24, 1994, p. 35.



In the *Book of Gods and Rites*, Durán wrote that priests would smear themselves in bitumen called teotlaqualli (“flesh/food of the gods”), which they believed would protect them from evil. It contained ground ololiuqui seeds and mashed “poisonous creatures” such as spiders, vipers and scorpions.<sup>13</sup> Colonial missionary José de Acosta also wrote of teotlaqualli that additionally contained large quantities of tobacco. He added that in applying this ointment to their skin, the priests would become sorcerers who conversed with the devil and lost all fear, becoming cruel and bold deliverers of human sacrifice.<sup>14</sup>

Hernándo Ruiz de Alarcón dedicated two chapters on the use of ololiuqui in his 1629 *Treatise on the Heathen Superstitions That Today Live Among the Indians Native to This New Spain*, and similarly described its application by priests in teotlaqualli.

Elferink wrote extensively on teotlaqualli in a 1999 paper, *Teotlaqualli: The Psychoactive Food of the Gods*. In the article, Elferink says that its application was not exclusive to priests, but that new emperors were ceremonially anointed with it, as well as those recently deceased.<sup>15</sup> This anointment was supposed to confirm the *tlatoani* as high priest by giving them divine properties.<sup>16</sup> It is possible that covering a deceased *tlatoani* in “the flesh/food of the gods”, before being rested at Huitzilopochtli’s temple, signified a ruler’s transition into the company of the gods.

### **Patron gods:**

Both an ololiuqui flower and tendril appear on the famous Xochipilli statue, so one can assume its use was associated to the god of flowers. Patrizia Granziera has suggested that ololiuqui could be associated with the god Macuilxochitl (five flowers), as the plant has a five-petalled flower.<sup>17</sup> Macuilxochitl does, however, appear to be another name or aspect of Xochipilli.<sup>18</sup>

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<sup>13</sup>D. Durán, *Book of Gods and Rites and the Ancient Calendar*, University of Oklahoma Press, Norman, 1977, pp. 114-115.

<sup>14</sup> J. de Acosta, *Natural and Moral History of the Indies*, Duke University Press, Durham, 2002, p. 309.

<sup>15</sup> Jan GR Elferink, ‘Teotlaqualli: The Psychoactive Food of the Aztec Gods’, *Journal of Psychoactive Drugs*, 31:4, 1999, pp 435-440

<sup>16</sup> Ibid, p. 437.

<sup>17</sup> Patrizia Granziera, ‘Concept of the Garden in Pre-Hispanic Mexico’, *Garden History*, Vol. 29, No. 2 (winter, 2001), p. 187.

<sup>18</sup> ‘Encyclopedia Mythica’, 1997, retrieved 15/08/13:

<http://www.pantheon.org/articles/m/macuilxochitl.html>

**Archaeological evidence:**

An ololiuqui flower and tendril were identified by Schultes on the statue of Xochipilli. This is perhaps one of the more famous examples in the archaeological record. Additionally, the mural of the “Great Goddess of Teotihuacan” [Figure 4] discovered in the holy city’s ruins contains a plethora of flower imagery, including *Turbina*. Furst suggested that the vine-like plant behind the goddess was in fact *Turbina corymbosa*.<sup>19</sup> To reaffirm this theory, if one looks at the bottom of Figure 4 at the table placed in front of the Goddess, the round seed-like objects bear a great resemblance to ololiuqui seeds.



Figure 4: Reproduction of the Great Goddess of Teotihuacan, MNA, Mexico.

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<sup>19</sup> P. Furst, Peter 1974 Morning Glory and Mother Goddess at Tepantitla, Teotihuacan: Iconography and Analogy in Pre-Columbian Art. In *Mesoamerican Archaeology: New Approaches*. Edited by Norman Hammond, pp. 187-215. University of Texas Press, Austin. p. 198.

ii) **Peyote Cactus (*Lophophora williamsii*)**



Figure 5: Variety of peyote cacti, top left contains young peyote cluster (1-3 years old), top right contains juvenile button, adult flowering cactus (4+ years old), and young peyote cluster, bottom left contains three young buttons (less than a year old).<sup>20</sup>

**Sahagún:**

“This peyote is white and grows only there in the north region called Mictlan. On him who eats it or drinks it, it takes effect like mushrooms. Also he sees many things which frighten one, or make one laugh. It affects him perhaps one day, perhaps two days, but likewise it abates. However, it harms one, troubles one, makes one besotted, takes effect on one. *I take peyote; I am troubled.*<sup>21</sup>”

**Brief description:**

A spineless, blue-green to blue-grey, napiform cactus, that grows to 15cm in length and 5-6cm in diameter.

<sup>20</sup> Photo taken by Adrian Andreacchio, April 2012.

<sup>21</sup> Sahagún, Book 11, p. 129.

**Distribution:**

Desert areas from Texas to Central Mexico, namely in Tamaulipas, Coahuila, Nuevo León, San Luis Potosí, Zacatecas. [Figure 6]

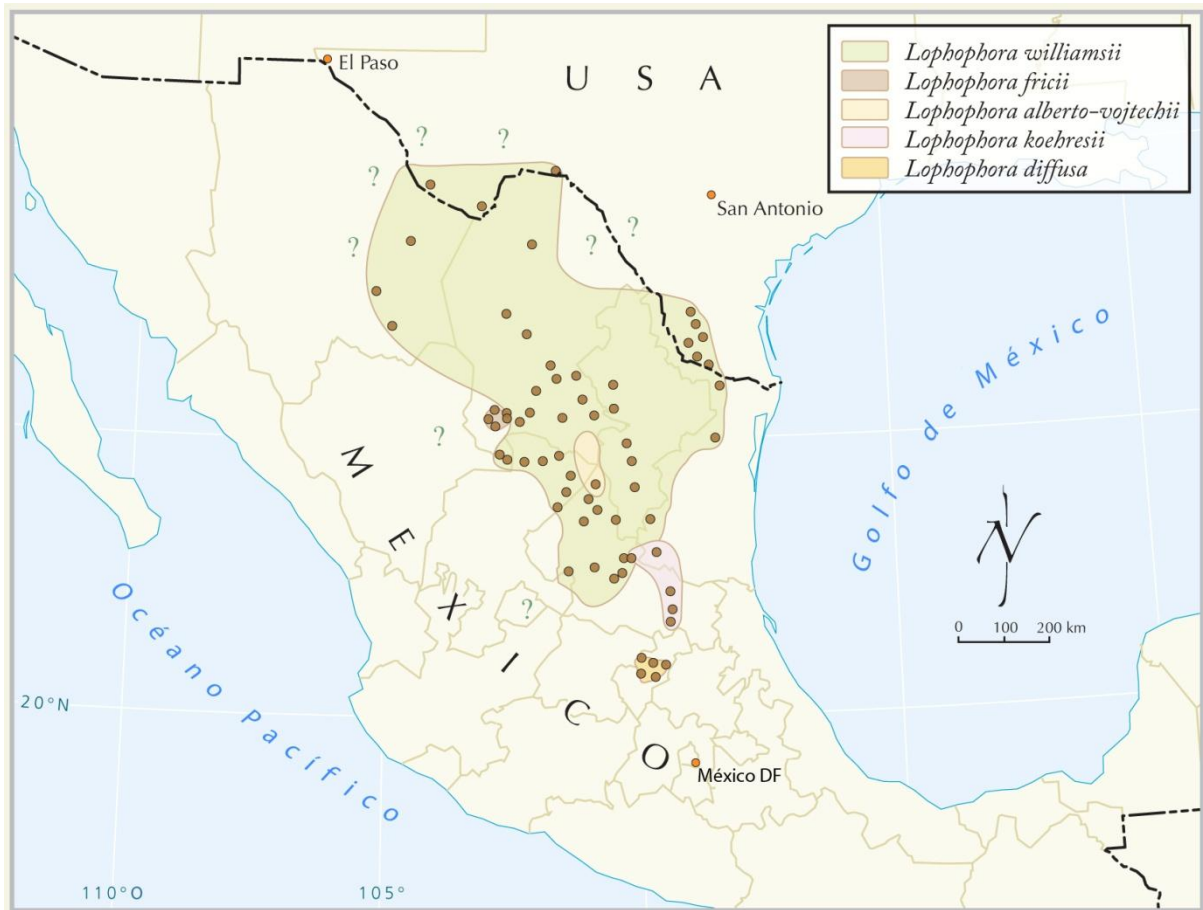


Figure 6: Distribution of wild peyote.<sup>22</sup>

**Name in Nahuatl:**

Peyōtl/peiotl, translated: related to peyōni ("to glisten")<sup>23</sup> Alternative translations are "woolly medicine" or "fleecy drug."<sup>24</sup>

<sup>22</sup> Terry, M., 'Stalking the wild Lophophora: Part 3 San Luis Potosí (central), Querétaro, and Mexico City.' *Cactus and Succulent Journal*, 80:6, 2008, pp. 310-317.

<sup>23</sup> JR Andrews, *Workbook for Introduction to Classical Nahuatl*, Revised Edition, University of Oklahoma Press, Norman, 2003, p. 246.

<sup>24</sup> Richard Evans Schultes, 'The Appeal of Peyote (*Lophophora williamsii*) As a Medicine', *American Anthropologist*, October-December 1938, New Series 40(4/1): pp. 698-715. Accessed online, hence no specific page number: <http://www.americanethnography.com/article.php?id=20#UgjjkZJ9CHh>

**Other names:**

Cactus pudding, turnip cactus, whiskey cactus, white mule, devil's root, diabolic root and mescal button.<sup>25</sup> *Peyote zacatecensis* (Hernández, 1615), *Peyote xochimilcensis* (also described by Hernández, a misnomer for *Cacalia cordifolia*). *Echinocactus williamsii*, *Anhalonium lewinii*.<sup>26</sup>

**Psychoactive components:**

Mescaline and phenethylamine. The mescaline content of an adult plant can be up to 6%, but rarely exceeds 1%.<sup>27</sup> At least 200-500mg of mescaline needs to be ingested for psychedelic effects. Older peyote (4+ years) has a higher concentration of mescaline, with younger cacti having little to no mescaline content.

**Dosage:**

Between four and 14 dried “buttons”, ingested. A “button” generally refers to the top half of the cactus, cut from its roots. According to Schultes, the average contemporary ceremonial dosage is 12 buttons, the lowest being four buttons, and the highest being over 30.<sup>28</sup> The quantity of buttons consumed varies from person to person and the ritual context. Dried buttons are placed in the mouth, “softened with saliva and swallowed without mastication.”<sup>29</sup> Peyote tea is also brewed from the dried, ground buttons. According to de Smet, the Huichols use deer-bone clysters to perform enemas, using a mixture of dried peyote and water, or fresh peyote and its juice.<sup>30</sup> For some medicinal applications, a paste of fresh buttons is ground using a *metate* and applied locally.<sup>31</sup>

**Medicinal uses:**

Due to peyote’s mescaline content, the cactus is better known today as the harbourer of an often legally controlled psychedelic alkaloid, rather than as a useful

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<sup>25</sup> E.F Anderson, *The Cactus Family*, Timber Press, Pentland, 2001, p. 396.

<sup>26</sup> Rätsch, 2005, p. 327.

<sup>27</sup> P.AGM de Smet, *Ritual enemas and snuffs in the Americas*, 1985, Amsterdam, CEDLA Publications p. 38.

<sup>28</sup> Schultes, 1938, op. cit.

<sup>29</sup> De Smet, op. cit., p. 37.

<sup>30</sup> Ibid.

<sup>31</sup> Schultes, 1938, op. cit.

medicine. Traditionally, the medicinal application of peyote has often outweighed its entheogenic use. Peyote is, in fact, considered a veritable panacea in the traditional medicines of many Mexican and modern-day North American plains tribes.<sup>32</sup> Indeed, so important is the plant in Mexican folk medicine, it has its own Spanish verb – *empeyotizarse* – “to treat oneself with peyote.”<sup>33</sup>

Historically, it has been used to treat ailments such as: arthritis, consumption, influenza, intestinal disorders, diabetes, snake and scorpion bites, and *Datura* poisoning.<sup>34</sup> Peyote also played an important role in warfare and hunting as a stimulant and anorectic by reportedly allowing partakers to overcome fatigue, hunger and thirst for five days.<sup>35</sup>

To further differentiate its medicinal properties from the “intoxicating” properties, Sahagún included a second entry for peyote in Chapter 7 of Book 11, “which telleth of the medicinal herbs.” The brief entry cites peyote as a fever medicine that “... is eaten, it is drunk moderately, just a little.”<sup>36</sup> The caution stressed regarding the quantity consumed suggests that it was well known that a small amount was useful for medicine, while a large dosage would cause unwanted maddening effects. It is therefore possible to suggest that a medicinal dosage of peyote must have been derived from between one and four buttons.

In treating high fever, the Huichol make a decoction of dry, powdered peyote mixed with cold water and administer it as an enema; a practice that has possibly endured from the pre-Columbian era.<sup>37</sup>

Schultes has argued that peyote’s medicinal and stimulant properties are the primary reason for the plant’s traditional and present-day tribal use, while the “peyote vision” has been incidental.<sup>38</sup> This is based on the apparent rareness of visions, the reported lack of desirability of visions and the lack of substantial primary evidence mentioning visions. Schultes notes the ceremonial use of peyote by the Huichol, but understates the importance of their peyote visions. Peyote imagery features frequently in Huichol bead art

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<sup>32</sup> Ibid.

<sup>33</sup> Rätsch, 2005, p. 333.

<sup>34</sup> A. Gottlieb, *Peyote and other Psychoactive Cacti*, Ronin Publishing, Oakland, 1997, p. 14.

<sup>35</sup> Léon Diguët, *Les Cactacées utiles du Mexique*, 1928, cited in Schultes, 1938.

<sup>36</sup> Sahagún, Book 11, p. 147.

<sup>37</sup> Rätsch, 2005, p. 333.

<sup>38</sup> Schultes, 1938, op. cit.

[Figure 7] with its intensely coloured patterns. It seems folly to argue that their art is not in part inspired by the “peyote vision”, especially with the cactus inhabiting such a revered place in their ritual lives.



Figure 7: Modern example of Huichol bead art. Note the intense patterns, peyote-shaped and coloured figure on the left, and a central blue-green button in the centre. Photo by Adrian Andreacchio, Museo de Arte Popular, Mexico, 2013.

Schultes provided further evidence of the plant’s primarily therapeutic use, rather than its use as an entheogen, in exploring the uptake of peyote in modern tribal groups. The cactus apparently gained “conversions” to the peyote cult, not because of its ability to provide visions, but as a cure for illness.<sup>39</sup> In analysing the early colonial accounts, it would appear that the cactus was as frequently cited as intoxicating as it was medicinal. The aforementioned translation of the Nahuatl *peyōtl* as “woolly medicine” also provokes debate on the primary role of peyote in pre-Columbian life.

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<sup>39</sup> Ibid.

The Huichol still use fresh peyote juice to prevent wound infection and promote faster healing;<sup>40</sup> a folk medicine that is reinforced by modern science. Modern studies of peyote extracts have found antibiotic elements,<sup>41</sup> alongside the alkaloids hordenine and tyramine, which have antibacterial properties.

### **Ritual associations:**

While it has been argued that peyote's medicinal values were perhaps its primary function, there is still substantial evidence of its use as an entheogen provided by the chroniclers and as reaffirmed by the Inquisition's attitude toward the cactus.

Sahagún states that it comes from "the north region called Mictlan." (Mictlan was also the name for the Aztec Underworld). The actual location of Mictlan is a matter of academic dispute, but Sahagún cites it as a place in the north, and that corresponds to the area of distribution for peyote in relation to Tenochtitlan. The Mictlan region referred to by the Aztecs is called *wirikuta* ("paradise") by the Huichol. This is the very same place where the ceremonial "peyote hunt" takes place, and where the Huichol go to "find themselves."<sup>42</sup>

Hernández wrote of peyote's purported fantastical effects in *The Natural History of New Spain* (1615), and named it *Peyotl zacatecensis*:

**"This root is attributed with wondrous properties, if you can believe the things that are said about it. Those who take it receive the divine gift of clairvoyance and are able to know future things, like prophets."**<sup>43</sup>

According to Hernández, the Chichimeca would use peyote to find thieves, and to prepare for tribal warfare, as they were convinced peyote had divinatory attributes.<sup>44</sup> "Chichimeca" was a Mexica catch-all term for northern nomadic tribes. It has been suggested that contemporary Tarahumara and Huichol peoples, who both have active peyote rituals, are their descendents.<sup>45</sup> Furst wrote that the Huichol use of peyote, including

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<sup>40</sup> Adam Gottlieb, *Peyote and Other Psychoactive Cacti*, p. 14.

<sup>41</sup> McLearly, et al., 'Antibiotic activity of an extract of peyote [*Lophophora williamsii* (Lemaire) Coulter]', *Economic Botany*, 14, 1960, pp. 247-49.

<sup>42</sup> Rátsch, 2005, p. 329.

<sup>43</sup> *Ibid.*

<sup>44</sup> Jan G.R. Elferink, 'Some Little-Known Hallucinogenic Plants of the Aztecs', *Journal of Psychoactive Drugs*, 20:4, 1988, p. 433.

<sup>45</sup> Rátsch, 2005, p. 329.



the “peyote hunt” ritual, “is the closest extant to the pre-Columbian ritual,”<sup>46</sup> an argument that possibly reaffirms their pre-Columbian heritage.

In contrast to Sahagún and Hernández’s words, the Inquisition took serious note of the purported powers of peyote and deemed it a tool of the Devil, declaring that did not possess the magical, healing, hallucinogenic and clairvoyant properties attributed to it. A decree of 1620, intent of curbing the widespread native consumption of “devil’s root”, strictly prohibited peyote use, regardless of rank or social standing. Confessors were given the authority to absolve the sin of peyote consumption prior to the decree, and its future ingestion was considered an act of heresy.<sup>47</sup> The fact that the Inquisition took such interest in punishing the utilization of peyote suggests that it still played a significant role in post-Conquest Mesoamerican ritual life; a role that was undermining the Catholic proselytisation of the New World.

#### **Associated deities:**

According to Aztec mythology, peyote was discovered by Patecatl and his wife Mayahuel – both gods of pulque and agave respectively.

#### **Archaeological evidence:**

Remains of peyote have been discovered at archaeological sites in the Trans-Pecos region, Texas, that are approximately 6,000 years old.<sup>48</sup> At excavations in the north-east of Mexico, biological remains have been recovered that are approximately 2,500 to 3,000 years old.<sup>49</sup> A strung necklace of dried peyote buttons dated 810-1070 CE was also found in a cave in west central Coahuila.<sup>50</sup>

Christian Räscht cited a number of clay figurines found in western Mexico, in Colima, Nayarit and Guerrero, which depict the cactus or a related peyote cult. They include one

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<sup>46</sup> P. Furst, *Flesh of the Gods*, Praeger, New York, 1972, p. 137.

<sup>47</sup> Licenciado D. Pedro Nabarre de Isla (Rubric).Trans., Irving A. Leonard, 'Peyote and the Mexican Inquisition, 1620', *American Anthropologist*, New Series, Vol. 44, No. 2 (Apr. - Jun., 1942), pp. 324-326.

<sup>48</sup> Boyd, Carolyn E., and J. Philip Dering. 'Medicinal and hallucinogenic plants identified in the sediments and pictographs of the lower Pecos, Texas Archaic.' *Antiquity* 70 (268), 1996, 256-75. p. 259.

<sup>49</sup> Adovasio, J.M., and G.F. Fry. 'Prehistoric psychotropic drug use in northeastern Mexico and Trans-Pecos Texas.' *Economic Botany* 30, 1976, pp. 94-96.

<sup>50</sup> Bruhn et al., 'Peyote Alkaloids: Identification in a Prehistoric Specimen of *Lophophora* from Coahuila, Mexico,' *Science*, New Series, Vol. 199, No. 4336 (Mar. 31, 1978), pp. 1437-1438.

figurine putting a peyote-like object in his mouth, and another ceramic object of a child holding a peyote cactus in each hand.<sup>51</sup>

Bone-tubes similar to those used by the Huichol have been found in the tombs of the Maya Classic elite, and there exist pictorial ceramics of bone-tube enema apparatuses being used for ceremonial purposes by the elite.<sup>52</sup> It is possible to infer that these bone tubes were used in the same manner of the Huichol for peyote enemas.<sup>53</sup>



Figure 8: “Man eating peyote or a bunch of flowers”, Cleveland Museum of Art, (*Azteca Mexica*, p .157).

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<sup>51</sup> Rättsch, 2005, p. 331.

<sup>52</sup> Both Michael Coe and Peter Furst have explored this, in collaboration. See Michael D. Coe, *The Maya, 7<sup>th</sup> edition*, Thames & Hudson, London, 2005 and Furst, Peter T. & Michael D. Coe, ‘Ritual enemas’. *Natural History*, 86, 1977, pp. 88-91. For pictorial evidence of these ceramics see de Smet, op. cit., plates 1-43.

<sup>53</sup> See de Smet, p. 37.



Figure 9: Container with juvenile peyote button clusters and adult cacti or flower, photo taken by Adrian Andreatchio in the Zultepec archaeological store rooms, May 2013.



Figure 10: Arm of the Xochipilli statue, photo taken at the MNA, Mexico City, 2013.

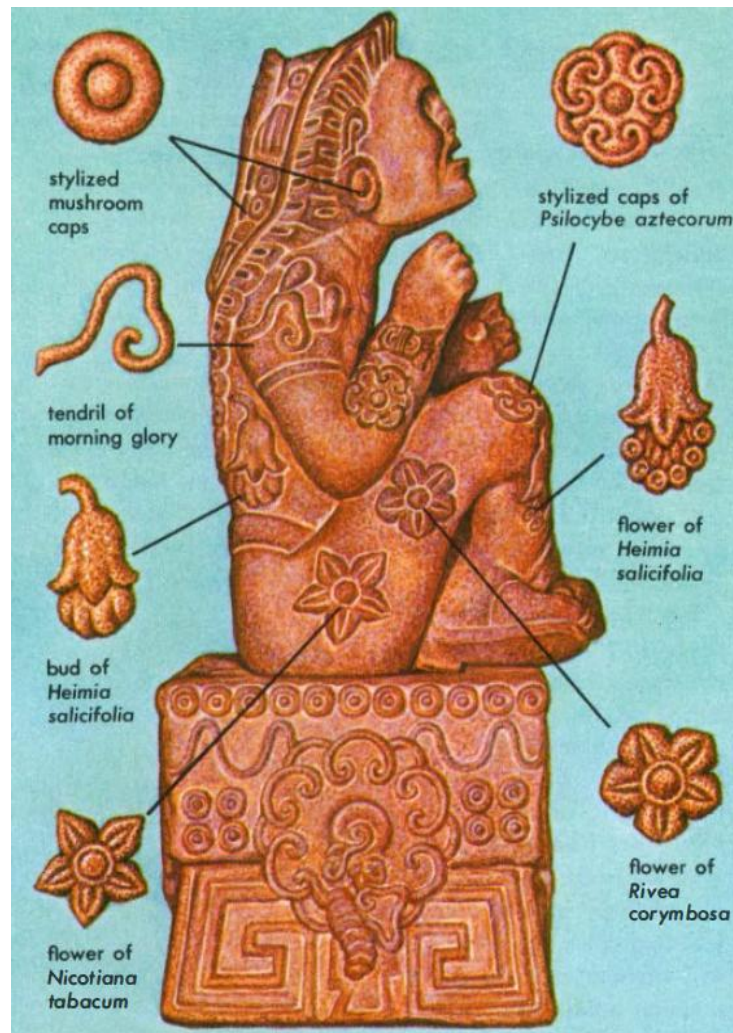


Figure 11: Labelled statue of Xochipilli, Richard Schultes, 1976.

If one looks at the representations on the statue [Figure 10 & Figure 11], the iconography appears to be very clear and accurate reproductions of the flowers of the plants in question. My argument with Schultes' identification is why, if all of the other plants are accurate, are the *Psilocybe aztecorum* caps "stylised"? Indeed, it bears little resemblance to a *Psilocybe aztecorum* cap, or even series of three caps gathered together. If one instead looks at the icon as a whole and accurate representation of a flower head or button, it bears closer resemblance to an adult peyote cactus. [Figure 5]

The unidentified receptacle in Figure 9 was found while on fieldwork in the archaeological stores at Zultepec, Mexico. It appears to display a central cactus, and four juvenile button clusters, and may have once held dried peyote buttons. Figure 8 is apparently a "man eating peyote", or possibly smelling flowers. The held object somewhat resembles a "grandfather" peyote (8+ years old), or a large cluster of peyote.

iii) **Teonanácatl (Psilocybe mexicana Heim & Psilocybe spp.)**



Figure 12: *Psilocybe Mexicana*.<sup>54</sup>

**Sahagún:**

“It is called *teonanácatl*. It grows on the plains, in the grass. The head is small and round, the stem long and slender. It is bitter and burns; it burns the throat. It makes one besotted; it deranges one, troubles one. It is a remedy for fever, for gout. Only two [or] three can be eaten. It saddens, depresses, troubles one; it makes one flee, frightens one, makes one hide. He who eats many of them sees many things which make him afraid, or make him laugh. He flees, hangs himself, hurls himself from a cliff, cries out, takes fright. One eats it in honey.

I eat mushrooms; I take mushrooms. Of one who is haughty, presumptuous, vain, of him it is said: “He mushrooms himself.”<sup>55</sup>

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<sup>54</sup>Erowid.org, 2003.

[http://www.erowid.org/plants/mushrooms/images/archive/psilocybe\\_mexicana2.jpg](http://www.erowid.org/plants/mushrooms/images/archive/psilocybe_mexicana2.jpg)

<sup>55</sup> Sahagún, Book 11, p. 130.

**Description:**

*Psilocybe mexicana* is a psychedelic fungus native to Mexico of the Strophariaceae family. It is coloured beige to brown. Its cap is bell-shaped to conic, with a slight papilla and can be from between 0.5-5cm in diameter. It is known to grow up to 10cm tall.

**Distribution:**

*P. mexicana* is known to grow only in Mexico and Guatemala, common at high elevations between 300-550 meters, and rarer beneath that. It also grows at altitudes of 1,000-1,800m in subtropical forests.<sup>56</sup>

**Nahuatl names:**

Nanácatl, teonanácatl and teotlaquilnanácatl. In Nahuatl poetry they have been referred to as “flowers that intoxicate.”<sup>57</sup>

Nanácatl, directly translated, means “mushroom.”<sup>58</sup> Teonanácatl (“divine flesh” or “divine mushroom”) has been thought to specifically refer to *Psilocybe mexicana*. According to Guzmán, modern Nahuatl speakers do not use the term “teonanácatl”; instead opting for “teotlaquilnanácatl” to refer to various *Psilocybe* spp.<sup>59</sup> Guzman further argues that “teonanácatl” was yet another misnomer of Sahagún’s.

“Tlaquil” in teotlaquilnanácatl is a derivative of “tlacuil”, which means “painting”. Aztec scribes who drew and painted the codices were called “tlacuilos”. It has therefore been suggested that “teotlaquilnanácatl” translates as “divine mushroom that paints or describes through colour figures.”<sup>60</sup>

Recent ethnomycological studies have sought to clarify precisely which mushrooms the aforementioned names refer to. Instead of *Psilocybe mexicana*, it has been suggested that *Psilocybe zapotecorum* is the true “teonanácatl”.<sup>61</sup> Given the current mycological dispute, this catalogue entry refers to the historically recorded use of teonanácatl: *P. mexicana* or other *Psilocybe* spp.

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<sup>56</sup> Rátsch, 2005, p. 669.

<sup>57</sup> Granziera, op cit., p. 187.

<sup>58</sup> F. Herrera, *Nahuatl-English, English-Nahuatl*, Hippocrene Books, New York, 2010, p. 116.

<sup>59</sup> Gastón Guzmán, ‘New Taxonomical and Ethnomycological Observations on *Psilocybe* S.S. from Mexico, Africa and Spain’, *Acta Botánica Mexicana*, 100, 2012, p. 91.

<sup>60</sup> Ibid, p. 92.

<sup>61</sup> Ibid, pp. 79-106.

**Other names:**

Mexican magic mushroom.

**Psychoactive material:**

Psilocybin and psilocin are the active psychedelic compounds.

**Dosage:**

The active dose of psilocybin is 6 to 12mg, and 20 to 30mg will cause strong visions.<sup>62</sup> A safe, presumably medicinal dosage is “two or three”, according to Sahagún.

**Medicinal uses:**

Teonanácatl lacks a wealth of information regarding its traditional medicinal uses, and appears to have primarily been used as an entheogen. Sahagún listed teonanácatl as a fever and gout medicine,<sup>63</sup> a function many other Aztec hallucinogens served. Hernández listed no medical applications for teonanácatl, only describing them as “intoxicating”.<sup>64</sup> There is no reference to *nanácatl* of any form in the *Badianus Manuscript*.

In modern medicine, recent studies conducted by Imperial College London have indicated that psilocybin is an effective anti-depressant.<sup>65</sup> Other studies have shown positive outcomes in sending Obsessive Compulsive Disorder and Clinical Depression into immediate remission, lasting a number of months.<sup>66</sup>

**Ritual associations:**

The ritual, ceremonial and even celebratory consumption of teonanácatl was well documented by a variety of post-Conquest chroniclers. In a similar fashion to the ingestion of other entheogens, the Aztecs would add teonanácatl to a cacao-based beverage.<sup>67</sup> Psychoactive mushrooms were awarded to warriors and merchants that had returned

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<sup>62</sup> Schultes, 2001, p. 159.

<sup>63</sup> Sahagún, Book 11, pp. 130, 147.

<sup>64</sup> Richard Evans Schultes, 'Teonanacatl: The Narcotic Mushroom of the Aztecs', *American Anthropologist*, vol. 42, 1940, pp. 429-443.

<sup>65</sup> 'Your brain on 'shrooms', Stuart Mason Dambrot, medicalxpress.com, 2012. Accessed 01/08/13: <http://medicalxpress.com/news/2012-02-brain-shrooms-fmri-elucidates-neural.html>

<sup>66</sup> 'Effects of Psilocybin in Obsessive-Compulsive Disorder', unknown publication date, University of Arizona. Article hosted by MAPS.org. Accessed 01/08/13: <http://www.maps.org/research/psilo/azproto.html>

<sup>67</sup> Rätsch, 2005, pp. 501-502.

triumphantly from their missions, and would be consumed after a feast. In Book 9 of the Florentine Codex, "The Merchants," Sahagún writes of one such occasion:

**"At the very first, mushrooms had been served. They ate them at a time when, they said, the shell trumpets were blown. They ate no more food; they only drank chocolate during the night. ... When the mushrooms took effect on them, then they danced, then they wept. But some while still in command of their senses entered and sat there...on their seats; they danced no more, but only sat there nodding."**<sup>68</sup>

Diego Durán also wrote of mind-altering mushrooms being eaten in celebration of successful warriors. Once the mushrooms had taken effect, "they then went out to dance."<sup>69</sup>

Sahagún listed, in detail, the visions seen by those who had eaten *teonanácatl*. The visions were considered to be powerful personal omens of the future. Once the effects of the mushrooms had worn off, those present at the banquet conferred with each other their individual visions. The visions were perceived to be a form of divination, as Sahagún says, "Whatsoever was to befall one, they then saw all [in vision]."<sup>70</sup>

Durán recounted the forced ingestion of this entheogen by high priests, who were expected to give a vision-inspired divination of military success, or suffer the consequences:

**"...he had the elders and old priests eat green mushrooms and drink some strange concoctions so these ecstasy-causing substances would reveal to them whether or not their army would be victorious. And woe to those who predicted defeat, for they were immediately put to death, with no reprieve."**<sup>71</sup>

Coronations appeared to be the most important occasion for widespread mushroom consumption, and both Durán and Motolinia<sup>72</sup> wrote in some detail about the effects. Durán explained that they were eaten after the coronation sacrifice had been completed, once the

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<sup>68</sup> Sahagún, Book 9, pp. 38-39.

<sup>69</sup> D. Durán, *The History of the Indies of New Spain*, D. Heyden trans., University of Oklahoma Press, Norman, 1994, p. 307.

<sup>70</sup> Sahagún, loc. cit.

<sup>71</sup> Durán, 1994, p. 475.

<sup>72</sup> Motolinia, Fr Torbido de, *Historia de los Indios de Nueva Espana* (in *Coleccion de Documentos para la Historia de Mexico*, vol. 1, Mexico, 1858), p. 23.



courtyard had been bathed in human blood, and everybody “went out of their minds”. Under the powerful influence of the hallucinogens (what Durán calls “drunken madness”) revelations were seen.<sup>73</sup>

At this coronation, enemy chiefs visiting Tenochtitlan in secret were welcomed by Moctezuma with luscious gifts and ingested hallucinogenic mushrooms to dance all night.<sup>74</sup> What appears to be an act of benevolence towards the empire’s enemies has been interpreted as a way of proving the empire’s power and dominance over weaker “*caciques*”.

### Associated deities:

The very name “flesh of the gods”, or “divine flesh”, suggests a stronger relationship with *all* gods of the Mesoamerican pantheon, rather than simply one. Based on the archaeological and ethnographic evidence, Xochipilli has an undeniable association with teonanácatl and its ritual use. Piltzintecuhtli, a manifestation of Xochipilli, is displayed holding psychedelic mushrooms in the Codex Vindobonensis, facing a gathered host of deities [Figure 13]. This is perhaps a suggestion that Piltzintecuhtli is leading or mentoring the other gods in the use of teonanácatl.



Figure 13: Codex Vindobonensis, plate 24. The figure on the bottom right has been identified as Piltzintecuhtli, a manifestation of Xochipilli.

In the Codex Magliabechiano, a man can be seen ingesting hallucinogenic mushrooms, with the god of the dead and the Underworld, Mictlantecuhtli, touching the man. [Figure 13] Mictlantecuhtli’s appearance in this context could serve as a warning that an excessive consumption of mushrooms would lead to death, or that particular types of

<sup>73</sup> Ibid, p. 407.

<sup>74</sup> C. McEwan & L. Lopez Luján, *Moctezuma Aztec Ruler*, British Museum Press, London, 2009, p. 60.

mushrooms (in this case white) would cause death. The image remains open to interpretation.



Figure 14: Man ingesting hallucinogenic mushrooms, flanked by Mictlantecuhtli. Codex Magliabechiano, CL. XIII.3.<sup>75</sup>

#### Archaeological evidence:

Mushroom-related artefacts have been discovered relatively more frequently than other entheogens.<sup>76</sup> In *Flesh of the Gods*, Wasson recounted the frequent discovery of “mushroom stones” from Guatemala in the mid-20<sup>th</sup> century. He suggested that these pre-Classic Maya effigies could be evidence of a pre-Columbian mushroom cult, with artefacts dating back to 1000 BCE.<sup>77</sup>

Discounting Schultes’ identification of “stylised *Psilocybe aztecorum*” I also negate the proposal that there are representations of mushroom caps on Xochipilli’s ears [Figure 11]. Instead, what are represented on Xochipilli’s ears are ear-spools, which were frequently worn, and appear in the archaeological record.<sup>78</sup>

During my fieldwork, I noticed that ear-spools in the exact same style appear on a variety of other Aztec statues, including a representation of Mictecacihuatl, goddess of death [Figure 15].

<sup>75</sup> Image from FAMSI: [http://www.famsi.org/research/graz/magliabechiano/img\\_page181.html](http://www.famsi.org/research/graz/magliabechiano/img_page181.html)

<sup>76</sup> For an exhaustive list of Mesoamerican mushroom iconography in artefacts and codices, see Guzmán, op. cit., pp. 90-103.

<sup>77</sup> Wasson in Furst, 1972, pp. 187-188.

<sup>78</sup> McEwan, op. cit., pp. 100-101 for examples of Mixtec and Aztec ear-spools housed in the MNA, Mexico.



Figure 15: Mictecacihuatl with ear-spools Photo: Adrian Andreacchio, MNA, 2013.

Not convinced that this was merely a coincidence, I also encountered these very same earrings on representations of the following gods: Tlaltecuhтли, Chalchiuhtlicue, Cihuacóatl, Xólotl, Quetzalcóatl and Chicomecóatl.<sup>79</sup> To support this refutation, a 1999 edition of *Arqueología Mexicana* citing Schultes' theories omitted his identification of the ear-spools as “stylised mushroom caps”. Additionally, the identification of stylised “*Psilocybe aztecorum*” was changed to “unidentified entheogenic mushroom.”<sup>80</sup>

Instead, if one looks at the base of the Xochipilli statue [Figure 16], the centre-piece has a circular arrangement of mushroom-like heads, somewhat similar to the designs on Xochipilli's knees, which I have proposed are peyote. Schultes et al. have theorised that this is a stylised version of the cross-section of the caps of *Psilocybe aztecorum* (nanácatl).<sup>81</sup> Crucially, *P. aztecorum* grows in the foothills of Mount Popocatepetl – the place where the statue was found.

<sup>79</sup> See Alcina Franch, et al., *Azteca Mexica*, Lunwerg, Madrid, 1992, pp. 303, 343, 345, 346, 352, 356.

<sup>80</sup> *Arqueología Mexicana*, 7/39, 1999.

<sup>81</sup> Schultes et al, op. cit., p. 161.



Figure 16: Base of Xochipilli statue. Photo: Adrian Andreacchio, MNA, 2013.

iv) Toloache (*Datura innoxia* and *Datura stramonium*)



Figure 17, left: *Datura innoxia* flower. Right: *Datura stramonium*.<sup>82</sup>

**Sahagún:**

“It is also a fever medicine; it is drunk in a weak infusion. And where there is gout, there it is spread on, there one is anointed. It relieves, drives away, banishes [the pain]. It is not inhaled, neither is it breathed in.”<sup>83</sup>

**Description:**

*Datura innoxia* is a light-green-to-grey plant that grows between one and three metres high, with roots of up to 60cm long. It is heavily branched and has furry, serrated leaves. Its flower is white and funnel-shaped. Its fruit is green, thorny and pendulous, which is presumably the etymology of *Datura*'s English name; “Mexican thorn apple.” It is part of the nightshade family (Solanaceae).

<sup>82</sup> Photos from Erowid.org, 2000. Accessed 15/08/13:  
[http://www.erowid.org/plants/datura/datura\\_images.shtml](http://www.erowid.org/plants/datura/datura_images.shtml)

<sup>83</sup> Sahagún, Book 11, p. 147, number 31: “Toloa”.

**Distribution:**

*Datura innoxia* is native to Mexico. Its pre-Columbian distribution was limited to the south-west of the United States, Mexico, Guatemala and Belize.<sup>84</sup>

**Nahuatl names:**

Toloache, toloa, toloatzin (“nodding head”), tolochi, tolohuaxihuitl (“nodding herb”),<sup>85</sup> tlapatl, mixitl.

*Datura stramonium*, a plant with a very similar appearance and psychoactive components, was also called *Tolohuaxihuitl*. *Datura stramonium* is, however, a smaller plant with distinct flowers. The Badianus Codex listed both *Datura innoxia* and *Datura stramonium* under the same name, with diverse illustrations but similar medicinal applications [Figure 18]. Under the Nahuatl name of *mixitl*, Sahagún cited no medical application for a *Datura* spp., and he insisted that the plant should not be consumed as it will cause complete paralysis.<sup>86</sup>

Due to both plants having almost equal concentrations of psychoactive alkaloids and similar medicinal and spiritual applications, for the purposes of this catalogue “toloache” will refer primarily to *Datura innoxia*.

**Other names of interest:**

Mexican thorn apple, yerba del Diablo, xtoku (Mayan, “in the direction of the gods”),<sup>87</sup> and two Yucatec Maya words – tohk’u (“true god”)<sup>88</sup> and chelis k’u (“rainbow god”).<sup>89</sup>

**Psychoactive components:**

*Datura’s* leaves, roots, flowers and seeds all contain psychoactive alkaloids. The principal, and highly toxic, alkaloids are the tropanes: atropine, hyoscine and hyoscyamine. All of these alkaloids are found in most *Datura* spp. and deadly nightshade, and are individually used in modern medicine. Apart from being poisonous, the alkaloids function as a deliriant, a distinct class of hallucinogen that is neither a “psychedelic”, nor a “dissociative.”

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<sup>84</sup> Rätsch, 2005, p. 196.

<sup>85</sup> Ibid.

<sup>86</sup> Sahagún, Book 11, p. 130.

<sup>87</sup> Rätsch, loc. cit.

<sup>88</sup> R.L Roys, *The Ethno-Botany of the Maya*, ISHI, Philadelphia, 1976, p. 285.

<sup>89</sup> A. Barrera Vasquez, *Diccionario Maya Cordemex*, Ediciones Cordemex, Merida, 1980, p. 89.

**Dosage:**

A great deal of knowledge and caution is required in preparing *Datura* spp. for medicinal or ceremonial use due to the profound toxicity and highly unpredictable alkaloid content.

It can be used for medicinal purposes in mild doses, an aphrodisiac at moderate doses, and a shamanic hallucinogen at high doses, known to cause visions, excitation, dancing, delirium and possible death due to respiratory paralysis.<sup>90</sup>

It is unknown how much toloache would be safely be used in a medical application, without causing ill effects. Smoking no more than four leaves is considered an “aphrodisiac” dosage, though this is by no means precise. Maya shamans roll cigars (*chamal*), which are smoked until an altered state of consciousness is achieved. They usually contain one leaf of *Datura*, and a high-nicotine variant of tobacco.<sup>91</sup> (See section on *Nicotiana rustica*)

Hallucinogenic effects can be achieved by eating between 10 and 40 seeds; again, it is no precise science. 4 to 5g of dried leaves contain fatal levels of alkaloids.<sup>92</sup>

**Medicinal uses:**

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<sup>90</sup> Andreatchio, Adrian, ‘The use of analgesics, anaesthetics and other psychoactive plants in Aztec human sacrifice rituals.’, 2013.

<sup>91</sup> Rátsch, 2005, p. 197.

<sup>92</sup> Ibid.

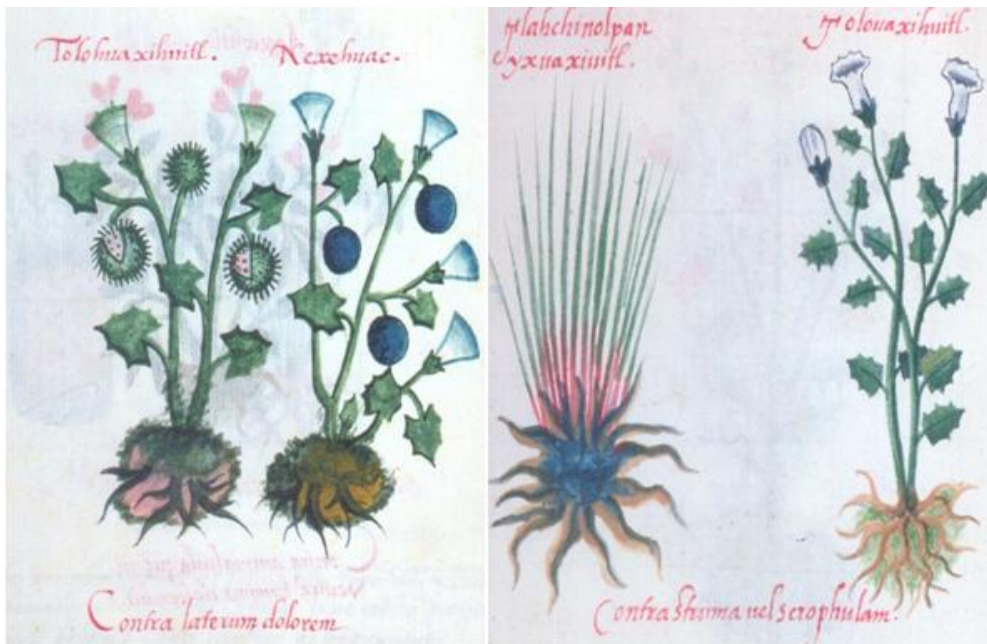


Figure 18, left: *Datura innoxia* as displayed in the Badianus Manuscript, a treatment for “pain in the side.” Right: *Datura stramonium*; applied to mumps and goitre.<sup>93</sup>

According to the *Badianus Manuscript*, both *Datura innoxia* and *Datura stramonium* were applied externally to haemorrhoids, and also to muscle pains as an anti-inflammatory agent in the form of poultices mixed with rose oil or butter. Specifically, *Datura stramonium* was listed as a treatment for mumps and goitre<sup>94</sup> while *Datura innoxia* was mixed with water “*contra laterum dolorem*”, that is, to treat side pains.<sup>95</sup>

It is explicitly stated that both plants are poisonous, must always be applied locally and may never be ingested.<sup>96</sup> An additional warning is given by Hernández, who cautions that excessive medical application in form of a poultice could drive a patient to madness and “various and vain imaginations.”<sup>97</sup> De Smet said that *Datura* was also used by the Aztecs, in suppository form, to relieve fever.<sup>98</sup>

<sup>93</sup> *Arqueología Mexicana*, no. 50, June 2013, p. 76. cites folio 25r of The Badianus Manuscript, and p. 84 (folio 29r).

<sup>94</sup> *Ibid.*, p. 76, (folio 25r).

<sup>95</sup> *Ibid.*, p. 84 (folio 29r).

<sup>96</sup> *Ibid.*, p. 76, (folio 25r), and p. 84 (folio 29r).

<sup>97</sup> United Nations Office on Drugs and Crime, ‘The plant kingdom and hallucinogens (part III)’, Richard Evans Schultes, 1970. Accessed 15/08/13: [http://www.unodc.org/unodc/en/data-and-analysis/bulletin/bulletin\\_1970-01-01\\_1\\_page005.html#s120](http://www.unodc.org/unodc/en/data-and-analysis/bulletin/bulletin_1970-01-01_1_page005.html#s120)

<sup>98</sup> De Smet, *op. cit.*, p. 36.



In contrast, Sahagún's description of *toloa* states that it is to be ingested as a weak infusion to treat fever. Additionally he cites its analgesic properties, presumably in the form of a cataplasm, in treating gout.<sup>99</sup>

Tarahumara medicine-men make a narcotic beverage which contains the roots, seeds and leaves to promote what can only be described as "diagnostic visions". This same beverage is consumed for its vision-forming abilities by the Tarahumara ceremonially.<sup>100</sup>

In modern medicine, *Datura's* key psychoactive alkaloids, atropine, hyoscyne and hyoscyamine, are commonly used, in minute doses, for relief in gastrointestinal disorders. Each alkaloid has other, distinct medicinal uses; however, none of them correspond to any pre-Columbian medical application.

### **Ritual associations:**

No clear evidence exists in the written sources of *Datura* being used as an entheogen by the Aztecs; however, it is and has been widely used by shamans in Mesoamerica and beyond, particularly among the Maya, the Navajo, Mixtec and Cahuilla peoples. The Huichol associate its use with sorcery and consider it a "bad plant of the gods."<sup>101</sup>

Conceptually, toloache was considered to be a "sister of *ololiuqui*"<sup>102</sup> to the Aztecs. Ololiuqui, as documented, was a principal entheogen of the Aztecs, and this association suggests that toloache was perhaps considered its equal. This is despite the deliriant alkaloids of toloache and the psychedelic LSA of ololiuqui causing entirely different reactions in psychoactive doses.

In his *Historia de las Indias de Nueva España*, Diego Durán mentioned a "Divine Liquor" that was given to sacrificial victims.<sup>103</sup> In the *Book of Gods and Rites*, Durán also mentions that prisoners were given a gourd of *teooctli* to drink, which dulled their senses.<sup>104</sup> "Octli" is the Nahuatl for "inebriating drink", and prefix "teo" suggests its divine nature.<sup>105</sup> It

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<sup>99</sup> Sahagún, Book 11, p. 147.

<sup>100</sup> Schultes, 1970, loc. cit.

<sup>101</sup> Rátsch, 2005, p. 198.

<sup>102</sup> Gilberto Camilla, 'Le erbe del diavolo: aspetti antropologici,' *Altrove*, vol. 2, 1995, p. 111.

<sup>103</sup> Durán, 1994, p. 186.

<sup>104</sup> . Durán, *Book of Gods and Rites and the Ancient Calendar*, University of Oklahoma Press, Norman, 1977, p. 178.

<sup>105</sup> Andreacchio, op. cit., p. 7.

is therefore safe to assume that the “divine liquor” given to sacrificial victims and *teoctli* given to prisoners were the same drink.

The concoction is believed to be comprised of either cacao or *pulque* and mixed with a narcotic. Christian Räscht has suggested that the narcotic in *teoctli* could have been *D. inoxia*.<sup>106</sup> As has been explored, *Datura* is an incredibly powerful deliriant that can cause excitation, dancing and total paralysis. Durán wrote that women who were to be sacrificed that refused to dance and sing were forced to become "intoxicated with a certain potion, and she became gay..."<sup>107</sup> The purpose of drugging the victim was to ensure the victim had no fear of death, which was considered a bad omen. Given the plant's effects, it can be inferred that it was likely the narcotic included in the *teoctli* given to sacrificial victims.

#### **Associated deities:**

No evidence has been found of any Aztec patron god of toloache, however, as per above, it was associated with human sacrifice ceremonies that were dedicated to the gods. A Mayan name for *D. inoxia*, “*xtoku*”, meaning “in the direction of the gods” does, however, suggest a correlation between its deliriant, vision-enduing properties and its use as an entheogen, perhaps as a plant that moves one closer to communicating with the gods.

The Yucatec Maya names, “true god” and “rainbow god” clearly point to the plant's use to communicate with the gods, namely the rainbow god. There is good evidence that *Datura* was used by the Maya in hallucinogenic enemas that helped the nobility commune with the gods and also reduce the pain caused by ritual bloodletting.<sup>108</sup> Yaxchilan lintels 24 and 25 [Figure 19] demonstrate both ritual bloodletting and visions of the gods.

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<sup>106</sup> R. Christian, *Ethnopharmakologie und Parapsychologie*, Berlin: Express Edition, 1986, p. 234.

<sup>107</sup> Durán, 1977, p. 232.

<sup>108</sup> See: Brian Stross and Justin Kerr, “Notes on the Maya vision quest through enema”, University of Texas, [www.utexas.edu/courses/stross/papers/enema.rtf](http://www.utexas.edu/courses/stross/papers/enema.rtf)



Figure 19: Yaxchilan lintels 24-25, Lady Xoc's bloodletting ritual and serpent hallucination. British Museum.

#### Archaeological evidence:

There are few artefacts known to depict toloache, and I discovered no new ones while on fieldwork. Incense vessels [Figure 20] have been discovered in western, central and southern Mexico, which appear in the form of toloache's fruit [Figure 21]. According to Rättsch, *Datura* seeds are still burnt today for ritual and medicinal purposes, and any incense containing these seeds would have profound psychoactive effects.<sup>109</sup>

<sup>109</sup> Rättsch, 2005, p. 199.



Figure 20: Spiked incense burners in the form of toloache fruit and accompanying sketches of the find.<sup>110</sup>



Figure 21: *Datura innoxia* seed pod, Erowid 2001.

<sup>110</sup> Camilla, op. cit., pp. 106-107.

v) **Picietl (*Nicotiana rustica*)**



Figure 22: *Nicotiana rustica*. Photo Erowid.org, 2009.

**Sahagún:**

“Its leaves are wide, somewhat long; and its blossoms are yellow. It is pounded with a stone, ground, mixed with lime. He who suffers fatigue rubs himself with it, likewise he who has gout. And it is chewed. In this manner it is chewed: it is only placed in the lips. It intoxicates one, makes one dizzy, possesses one, and destroys hunger and desire to eat. He who has a swollen stomach places it on the stomach and there in the navel.”<sup>111</sup>

**Description:**

*N. rustica* closely resembles other *Nicotiana* spp. It grows 60-80cm in height, with yellow, usually five-petaled flowers and rounded leaves that are smaller than the *N. tabacum* plant's.

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<sup>111</sup> Sahagún, Book 11, p. 146.

**Distribution:**

*N. rustica* is thought to have originated in Mexico and spread from there throughout the Americas. It is now found globally.

**Nahuatl names:**

Picietl, yetl, yé.

**Other names:**

Wild tobacco, panacea (Latin), herba medicea,<sup>112</sup> farmer's tobacco. The word "cigar" derives from the Quiché term "sik'ar/siq'ar" – tobacco that has been rolled without a cover.<sup>113</sup>

**Psychoactive components:**

Nicotine is the primary psychoactive material and is found in the leaves. Siegel et al. suggested that as nicotine is the main pharmacologic agent in tobacco, it is what induces the plant's most powerful effects. Upon analysing wild-growing *N. rustica*, they found a nicotine content of at most 4.03%; 1% higher than the strongest cigarette tobacco (*N. tabacum*) smoked in the United States.<sup>114</sup> Siegel et al. also discovered *N. rustica* kept by the Huichols, reserved for special occasions, containing 18% nicotine - a concentration high enough to produce hallucinations and catatonia.<sup>115</sup>

**Dosage:**

Quantifying the dosage of *N. Rustica* is particularly difficult as, much like *Datura inoxia*, also of the Nightshade family, the already high levels of nicotine found in a leaf may vary greatly. Like *Datura*, an overdose could have extremely adverse effects. The Huichol have reported illness and death, caused by what is apparently severe nicotine poisoning, during their peyote hunt.<sup>116</sup>

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<sup>112</sup> Rätsch, 2005, p. 376.

<sup>113</sup> Ibid, p. 386.

<sup>114</sup> R.K Siegel, P.R. Collings & J.L. Diaz, 'On the Use of *Tagetes lucida* and *Nicotiana rustica* as a Huichol Smoking Mixture: The Aztec "Yahutli" with Suggestive Hallucinogenic Effects', *Economic Botany*, Vol. 31, No. 1 (Jan. – Mar., 1977), p. 18.

<sup>115</sup> Ibid, p. 22.

<sup>116</sup> Furst, 1976, '*Hallucinogens and Culture*'. Hosted on Drugtext.org, 2011. Accessed 01/07/13: <http://www.drugtext.org/Hallucinogens-and-Culture/chapter-two-tobacco-qproper-food-of-the-godsq.html>

Tobacco leaves are first sun-dried and left to air. The dried and crushed leaves were often mixed with other plants, such as *Tagetes lucida*, in incenses.<sup>117</sup> For entheogenic purposes, *N. rustica* was smoked as a cigar, or through a pipe. A ritual dosage could contain entirely picietl, or be blended equally with *Datura inoxia* (see section on **toloache**). For medicinal and shamanic purposes, the leaves were chewed, insufflated as a snuff, and juiced to be drunk or administered as an enema.

Sahagún described a traditional preparation in Book 11, writing:

**“Those who sell *piciete* [sic] crush it with lime and then powder both between the hands. Some do this with the incense of the earth, then take it in their hands and their mouth to soothe headache or induce drunkenness.”<sup>118</sup>**

#### **Medicinal uses:**

There were seemingly myriad uses for tobacco as a medicinal plant, with a number of reportedly successful applications that seem outrageous today. Indeed, when tobacco was first introduced to Europe, it was given the name “panacea”, and used extensively in medicine.

Crushed, juiced and applied as an ointment, picietl was used to relieve fatigue, gout and stomach troubles.<sup>119</sup> Hernández cited other topical applications in: curing indigestion, treating inflammation of the spleen, reducing cold pains, healing cancerous wounds and promoting general wound healing, as well as soothing toothache.<sup>120</sup>

According to Hernández, picietl smoke was also useful as a medicine. Rolled up and smoked, with the patient inhaling the fumes deep into their chest, tobacco was apparently a “miraculous” cure for asthma and breathing problems. The logic seems to be that smoking tobacco in this manner caused the patient to “admirably” expectorate the cause of asthma.<sup>121</sup> For women, picietl was smoked to alleviate ureteral conditions, halt vasovagal

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<sup>117</sup> See Adrian Andreatchio, op. cit., for uses of *T. lucida*, *N. rustica* and other plants in human sacrifice rituals.

<sup>118</sup> Sahagún Book 11, cited in Rátsch, p. 377.

<sup>119</sup> Sahagún, Book 11, p. 121.

<sup>120</sup> F. Hernández, *Historia de las plantas de Nueva España, Tomo I*, Imprenta Universitaria, Mexico, 1942, pp. 243-244.

<sup>121</sup> Ibid. p. 243.

syncope and relieve hot flashes.<sup>122</sup> Tobacco smoke was also thought to “strengthen the head”, produce sleep, relieve pain, cure migraines, and provide a drunken dulling of one’s sorrows.<sup>123</sup> Nicotine, especially in high concentrations, functions as a painkiller due to the increased release of beta-endorphin, an analgesic neurotransmitter.<sup>124</sup>

### **Ritual associations:**

It is important when analysing the use of tobacco, today a commonly consumed narcotic, that one does not let its contemporary form and widespread usage influence one’s perception of how the plant was used ritually as a powerful entheogen in the pre-Columbian period.<sup>125</sup> Siegel et al. reinforced this point:

**“Many other New World societies use tobacco in shamanistic practices. In many such practices, tobacco is often conceptually and functionally indistinguishable from true hallucinogens.”<sup>126</sup>**

It is largely for this reason that it has been included in this catalogue alongside other hallucinogenic, legally controlled plants. The overwhelming evidence suggests that the concentration of nicotine in *N. rustica* is high enough to cause hallucinations and delirium as powerful as many other entheogens. One could therefore not make a holistic and objective catalogue of Mesoamerican entheogens without including tobacco.

A little-known Italian historian and “adventurer” named Giorlamo Benzoni detailed the ritual smoking of tobacco in his 1568 publication - *Historia del Mondo Nuovo*:

**“... the smoke goes into the mouth, the throat, the head, and they retain it as long as they can ... and so much do they fill themselves with the cruel smoke, that they lose their reason. And there were some who take so much of it that they fall down as if they were dead, and remain the greater part of the day or night stupefied. ... See what a pestiferous and wicked poison from the devil this must be.”<sup>127</sup>**

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<sup>122</sup> Ibid.

<sup>123</sup> Ibid.

<sup>124</sup> Andreacchio, op. cit., p. 12.

<sup>125</sup> Andreacchio, op. cit., p. 10.

<sup>126</sup> Siegel et al., op. cit., p. 16.

<sup>127</sup> G. Benzoni, 1568, in 'History of the New World Vol. 21', trans. W.H. Smyth, Hakluyt Society, London, 1857, p. 81.



The conquistador Bernal Díaz del Castillo reported how *tlatoani* Motecuhzoma II smoked a handsomely decorated tube of tobacco and *liquidamber* after feasting and immediately slept.<sup>128</sup> After military campaigns, captured enemy war prisoners were brought Tenochtitlan to be sacrificed to the gods. According to Durán, on each occasion these prisoners were gifted incense, flowers and tobacco by the priests in order to prepare them for their grisly deaths.<sup>129</sup>

Tobacco also served a ritual and medicinal purpose in the coronation of new *tlatoani*. A gourd containing powdered tobacco, called a *yietecomatl*, was traditionally handed to the ruler-elect by the high priests during a *tlatoani's* coronation. The tobacco was then chewed for its “energising and narcotic qualities.”<sup>130</sup>

Annually, during the Toxcatl celebrations, a young warrior was selected to impersonate the god Tezcatlipoca for a year. For the duration of the year, the youth was allowed to move through the streets smelling flowers and smoking tobacco, impersonating gods and rulers.<sup>131</sup>

Monardes wrote of its use in divination by high priests who would smoke quantities of tobacco that would make them collapse. The priests would then provide village *caciques* with fortunes based on their visions.<sup>132</sup> The Huichols provide another contemporary example of *N. rustica's* traditional entheogenic use by revering it as “the proper tobacco of the shaman.”<sup>133</sup>

### **Associated deities:**

There is evidence of a direct godly association with *picietl* in chronicler Jéronimo Mendieta's *Historia eclesiástica Indiana*; “Others say that some see the plant called *picietl* ... as the body of the goddess Ciuacoatl [sic]. And for this reason it has several medicinal effects.”<sup>134</sup>

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<sup>128</sup> B. Díaz del Castillo, *The Memoirs of the Conquistador Bernal Díaz del Castillo, Vol 1*, trans. J. Lockhart, J. Hachard & Son, London, 1844, p. 231.

<sup>129</sup> Durán 1994, op. cit., pp. 180, 240, 301.

<sup>130</sup> McEwan, op. cit., p. 84.

<sup>131</sup> G. Olivier, *Mockeries and Metamorphoses of an Aztec God. Tezcatlipoca, 'Lords of the Smoking Mirror'*, Boulder 2008, University Press of Colorado, Boulder, 2008, pp.193-230.

<sup>132</sup> Monardes 1580, cited in Elferink, 1988, p. 430.

<sup>133</sup> Furst, 1976, loc. cit.

<sup>134</sup> Jéronimo Mendieta, cited in Räscht, p. 378.

Cihuacoatl, which translates “snake woman” – not to be confused with the Nahuatl title for high functionaries in Tenochtitlan – was primarily the goddess of motherhood, fertility and midwives. In Aztec mythology, she helped to create humanity in the Fifth Sun, the current epoch, by blending Quetzalcoatl’s blood with ground bones from past ages.

As patron god of flowers, and especially entheogens, Xochipilli’s patronage of picietl is highly likely. The Mayan “God L”, also known as the “Smoking God of Palenque”, is often depicted smoking bundled cigars.<sup>135</sup> [Figure 23] is the most famous example.



Figure 23: 8<sup>th</sup> century ca. relief of God L smoking, Palenque.

### Archaeological evidence:

*N. tabacum* flowers appear on the thigh, alongside other powerful hallucinogens, on the Xochipilli statue [Figure 11]. Tobacco was therefore seemingly conceived of as equally divine (and powerful) as other hallucinogens that are considered “strong” (and controlled) in modern society.<sup>136</sup>

The Aztecs typically used tubes or pipes made from easily perishable materials, such as wood or cane. Sahagún describes these tubes in Chapters 7 & 8 of Book 9 in the Florentine Codex.<sup>137</sup> Due to the increased perishability of the material, the prospects of discovering Aztec pipe artefacts are low.

<sup>135</sup> For a description of what the apparatus could be, see: 'Aerophone of the God L of Palenque?' by Roberto Velázquez Cabrera. <http://www.tlapitzalli.com/curingurimx/palenque/godl.html>

<sup>136</sup> Adrian Andreacchio, op. cit., p.10.

<sup>137</sup> See Sahagún, Book 9: The Merchants, pp. 33-37.

In 2012, Late-Mayan vessels from the Kislak Collection of the US Library of Congress were analysed for nicotine content using mass spectrometry techniques. One vessel (600-900 CE) [figure 24] was labelled with a glyph reading “the home of [one’s] tobacco”. The investigation revealed the first physical evidence of tobacco found in a Mayan container, and only the second of such trace-analyses studies proving the contents of a Mayan container.<sup>138</sup> Further mass spectrometry studies will surely be useful in revealing psychoactive alkaloids in future studies.



Figure 24: Vessel with Mayan tobacco glyph.<sup>139</sup>

While on fieldwork in Mexico at the MNA I photographed a vessel depicting what appeared to be an unidentified *N. rustica* flower. Comparing the image on the receptacle to a picietl flower [Figure 25], one can see a clear similarity - five circular and folded petals, with a large, round stamen.

<sup>138</sup> See: Zagorevski DV, Loughmiller-Newman JA, ‘The detection of nicotine in a Late Mayan period flask by gas chromatography and liquid chromatography mass spectrometry method,’ Rapid Commun Mass Spectrom. 2012, Feb 29;26(4), pp. 403-11.

<sup>139</sup> ‘First physical evidence of tobacco in Mayan vessel’  
<http://www.thehistoryblog.com/archives/date/2012/01/11>



Figure 25: (Left) Aztec bowl depicting *N. rustica* flower. (Right) Flower of *N. rustica*.<sup>140</sup>

## 5. Conclusions

This dissertation has shown, by creating a subdivided reference catalogue, the pre-Columbian use of powerful psychoactive plants for not only entheogenic purposes, but also a multitude of medicinal purposes. The catalogue is a sample of the better-known Mesoamerican entheogens, with more requiring further investigation. Nevertheless, the sample provided goes some way in displaying the varied use of psychoactives in everyday life.

These plants were not just sacred paths to the gods, used for clairvoyant visions, but also essential tools in treating illness. According to Ortiz de Montellano, 70% of the plants cited as fever remedies by Sahagún Codex contained chemicals that were “emically effective.”<sup>141</sup> Many of the psychoactives included in this catalogue were cited as fever remedies.

The research encountered difficulties in precisely identifying a species of plant based on the ethnographic sources. This was usually due to multiple Nahuatl names existing for the same plant, and conversely a single Nahuatl name being used a variety of plants

The dissertation has contested existing theories and proposed possible new findings of psychoactive plant imagery in pre-Columbian artefacts. Unfortunately, Dr López Luján

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140 Left: photo by Adrian Andreacchio, May 2013, MNA. Right: photo by William Rafti of the William Rafti Institute, 2004.

<sup>141</sup> Ortiz de Montellano, op. cit., p. 158.

confirmed that psychoactive plant material had yet to be identified at the ongoing excavations at the Templo Mayor, as was hoped in this dissertation's proposal. To reinforce this reality, I quote López Luján's statement on flora in his published book on the offerings found at the Templo Mayor:

**“Because of their perishability, relatively few remnants of the offerings of flora have endured until now. We found the remains of seeds and ears of corn, agave stalks and thorns, [unidentifiable] flowers, grass, squash, wood, copal, charcoal, and rubber. Through decay, most of the vegetable matter has lost its original form...”<sup>142</sup>**

This is due to the reality of the Templo Mayor site being often submerged in water, which causes organic material to rapidly decay. I do not feel this aspect of the research was a complete failure, as it has helped to frame the reality of present-day identification of organic materials, especially in a waterlogged excavation. By investigating archaeological stores and site museums, the research has additionally provided new samples of entheogen-related artefacts, and challenged established theories.

The research questions pertaining to the use of psychoactive plants have been answered by the creation of a Mesoamerican-specific catalogue, inspired by the globally scoped ethnopharmacological studies of the past. The catalogue will hopefully serve as a useful reference tool in the field of Mesoamerican Studies, as was its intention.

## 6. Recommendations

- 1) Due to word constraints, research conducted on other psychoactive substances was regrettably omitted. An expanded catalogue should also include the following: *Heimia salicifolia*, cacao, agave-based wine (octli and pulque), *Salvia divinorum*, and the as-yet taxonomically unidentified plants cited by Elferink, 1988.
- 2) Further investigation into the flower imagery on the ceramic drum below [Figure 26], and the pre-Columbian ritual bonds between music and entheogen use. I propose that the flower image in front of the nose is that of the little-studied entheogen *Heimia salicifolia*.

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<sup>142</sup> L. López Luján, *The Offerings of the Templo Mayor of Tenochtitlan*, trans. B.R & T. Ortiz de Montellano, University Press of Colorado, Niwot, 1994, p. 133



Figure 26: Ceramic drum, MNA. Photo by Adrian Andreacchio.

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