ETHNOPHARMACOLOGY OF SKA MARIA PASTORA
(SALVIA DIVINORUM, EPLING AND JATIVA-M.)
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All Spelling Errors are MINE - Illustrations were not included because of
the poor quality.

Summary

Salvia divinorum is a perennial labiate used for curing and divination by
the Mazatec Indians of Oaxaca, Mexico. The psychotropic effects the plant
produces are compared to those of the other hallucinogens employed by
the Mazatecs, the morning glory, Rivea corymbosa L., Hallier f. and the
psilocybin-containing mushrooms. A discussion of the role of ska Maria
Pastora in the native "pharmacopeia" is based on previous reports and
fieldwork by the authors, with a Mazatec shaman.

Introduction

Salvia divinorum (Epling & Jativa-M.) is a perennial herb in the Labiatae
(mint family) native to certain areas in the Sierra Mazateca of Oaxaca,
Mexico (Fig. 1). It is one of about 500 species of Salvia in the New World
subgenus Calosophe (Epling and Jativa-M., 1962). The plant grows in large
clones to well over 1m in height and its large green leaves, hollow square
stems and white flowers with purple calyces are characteristic taxonomic
features. This sage has been found only in forest ravines and other moist
humid areas of the Sierra Mazateca between 750 m and 1500 m altitude
(Diaz, 1975a). Carl Epling, who first described S. divinorum, reported
the newer as having a blue corolla, and it has been illustrated this way in
the literature (Epling and Jativa-M., 1962; Schultes, 1976). However, this
description has been shown to be an error, as all living specimens of the
plant have had blossoms with white corollas and purple calyces (Diaz,
1975a; Emboden, 1979).

S. divinorum is one of several vision-inducing plants employed by the
Mazatec Indians, one of the native Peoples living in the mountains and
upland valleys of northeastern Oaxaca. Unlike other Mexican tribes, there
is little information concerning their existence before the arrival of the
conquering Spanish, who reduced the Mazatecan population through exploi-
tation and disease (Weitlaner and Hoppe, 1964). The 1970 census estimated
their number at 92,540 (Cortes, 1979) and the language of the Mazatec-
Popoloca family is one of the many non-Spanish dialects spoken throughout
Mexico (Weitlaner and Hoppe, 1964). The Mazatecan ritual use of hallucino-
gens, such as mushrooms containing psilocybin and morning glory seeds
containing lysergic acid amide, has been widely publicized through the
investigations of R. Gordon Wasson and Albert Hofmann, among others
(Wasson and Wasson, 1957; Wasson, 1963; Hofmann, 1964; Hofmann,
1980).

Review of literature

Although the use of the mushrooms and morning glories was documented
by the Spanish conquistadores and chroniclers who arrived in Mexico during
the Sixteenth Century (Wasson, 1963), the literature on S. divinorum is
relatively recent. Wasson originally proposed that this Salvia was the
plant known to the Spanish by the Nahuatl (Aztec) name of pipiltzintzinli,
but new investigations suggest that the Mexican name probably refers to
Cannabis sativa L. (Diaz, 1979).

There are a number of common names for S. divinorum and nearly all
are related to the plant's association with the Virgin Mary. It is known to
the Mazatecs as ska Maria Pastora, the leaf or herb of Mary, the Shepherdess.
The name is usually shortened to ska Maria or ska Pastora and the sage is
also known by a number of Spanish names including hojas de Maria, hojas
de la Pastora, hierba (yerba) Maria or la Maria. The Mazatecs believe this
Salvia to be an incarnation of the Virgin Mary, and care is taken to avoid
trampling on or damaging it when picking the leaves, which are used both
for curing and in divination.

Attempts at the identification ska Maria Pastora were carried out in
conjunction with anthropological expeditions led by one of Mexico's leading
anthropologists, the former Austrian engineer, Roberto G. Weitlaner, who
rediscovered native use of hallucinogenic mushrooms among the Mazatecs
in 1936 (Wasson, 1963). On a field trip in 1938, Weitlaner's future son-in-
law, the American anthropologist, Jean B. Johnson learned that the Mazatecs
employed a "tea" made from the beaten leaves of a "hierba Maria" for
divination. The preparation was used in a manner similar to the "narcotic"
mushrooms and the semillas de la Virgen, which were later identified as
morning glory seeds (Johnson, 1939). Bias P. Reko, who knew Weitlaner
well, referred to a "magic plant" employed by the Cuicatec and Mazatec
Indians to produce visions. It was known as the hoja de adivinacion (leaf
of prophecy) and although Reko could not identify the plant, it was probably
S. divinorum (Reko, 1945).

In 1952 Weitlaner reported the use of a yerba (hierba)-de Maria by the
Mazatecs in Jalapa de Diaz, a small Oaxacan village. According to his
informant the leaves of this plant were gathered by curanderos (shamans or
healers), who went up into the mountains and harvested them after a session
of kneeling and prayer. For use in "curing" the foliage was rubbed between the hands and an infusion of from 50 to 100 leaves was prepared, the higher dose being used for alcohol "addicts". Around midnight the curandero, the patient and another person went to a dark quiet place (perhaps a house) where the patient ingested the potion. After about 15 min the effects became noticeable. The subject would go into a semi-delirious trance and from his speech the curandero made a diagnosis and then ended the session by bathing the patient in a portion of the infusion that had been set aside;

The bath supposedly ended the intoxicated state. In addition to such "curing", the yerba Maria also served for divination of robbery or loss (Weitlaner, 1952).

Five years later the Mexican botanist, A. Gomez Pompa, collected specimens of a Salvia known as "xka (sic) Pastora". He noted that the plant was used as a hallucinogen (alucinante) and a dose was prepared from 8 to 12 pairs of leaves. Since flowering material was not available, the sage could not be identified beyond the generic level (G6mez Pompa, 1957). The holotype specimen of S. divinorum was acquired by Wasson and Hofmann in 1962 while they were traveling with Weitlaner. Flowering plants were brought to them in the village of San Jose Tenango, as they were not permitted to visit the locality in which ska Maria Pastora grew. This collection was sent to Epling and Jativa-M. who described it as a new species of Salvia, S.divinorum (Wasson, 1962; Epling and Jativa-M., 1962). Wasson was the first to personally describe the effects of ska Pastora, relating the experiences he and members of his party had on ingestion of different doses of a beverage prepared from the plant’s foliage. At a session in July 1961 in which he participated, a curandera (female shamans are very common among the Mazatecs and other Mexican peoples) squeezed the juice of 34 pairs of leaves by hand into a glass and added water. Wasson drank the dark fluid and wrote that although the effects came on faster than those of the mushrooms, they lasted a much shorter time. He saw only "dancing colors in elaborate, three-dimensional designs" (Wasson, 1962).

Summing up the experience, he later stated (pers. comm.): A number of us (including me) had tried the infusion of the leaves and we thought we experienced something, though much weaker than the Psilocybe species of mushroom.

Hofmann and his wife, Anita, who accompanied Wasson on an expedition the following year, took the infusion prepared from five and three pairs of S. divinorum leaves, respectively. Mrs. Hofmann "saw striking, brightly bordered images" while Hofmann found himself "in a state of mental sensitivity and intense experience, which, however, was not accompanied -- by hallucinations" (Hofmann, 1980).

Maria Sabina, the Mazatec shaman made famous by Wasson, and who lives in the Mazatec highland town of Huautla, in Oaxaca, briefly mentioned her use of the plant in her autobiography (Estrada, 1977): If I have a sick person during
the season when the mushrooms are not available, I resort to the hojas de la Pastora. Crushed (molido) and taken, they work like the "children" (i.e., the mushrooms). Of course, the Pastora doesn't have as much strength.

Roquet and Ganc reported that the Mazatecs prepared a dose of S. divinorum from 120 pairs of crushed leaves and used the plant only when the mushrooms and morning glory seeds were not available. Roquet and his associates used the plant twice in their psychiatric investigations of Mexican hallucinogenic plants and stated that they had difficulties in working with it (Roquet, 1972).

Jose Luis Diaz and his coworkers studied the use of ska Maria Pastora in the Mazatec highlands during the 1970's. Diaz himself took the Salvia infusion under the supervision of a shaman, Dona J., on six different occasions, noting an increased awareness of the plants effects each time. The first changes he perceived were a series of complex and slowly changing visual patterns that occurred only in complete quiet with closed eyes. There were no colored geometric patterns which characteristically occur with ingestion of other hallucinogens nor were there auditory images. After a short time he noticed peripheral phenomena, such as a feeling of lightness in the extremities and odd sensations in the joints. The climax of effects, accompanied by dizziness or nausea (mareo), lasted about 10 min and disappeared about 0.5 h after ingestion of the infusion. Other, more subtle, effects seemed to persist for a few hours (Diaz, 1975a).

Hofmann (Hofmann, 1964) and Diaz (Diaz, 1975a) each investigated S. divinorum chemically without isolating and identifying any active principle. As noted above, the descriptions in the literature emphasize the mildness of the plant's effects. There are many ways to achieve visions other than by ingestion of classically defined "hallucinogens" such as mescaline, LSD and psilocybin. Among these are meditation, prayer, mental illness, disease (especially when accompanied by fever), poisoning, experiences of dying, and suggestion (placebo effect). Therefore, prior to conducting chemical and animal studies, we decided to attempt to clarify the role of S. divinorum as a vision inducer among the Mazatec Indians.

Mazatec healing

The following report is based on fieldwork with a Mazatec curandero, or healer, living near the Alemín Reservoir in the Mexican state of Oaxaca, about 100 km from the port of Veracruz. Although a study based on information from a single source is open to criticism, the jealous and secretive nature of native shamans works against statistical methods of survey. Visiting many shamans in a single area can actually lessen the amount of information gathered, as each curandero may fear the visitor is telling their secrets and giving their "power" to a rival. To them magic can hurt or kill. Wasson and Richard E. Schultes have both commented on the difficulty of making contacts with the curanderos of this region (Wasson and Wasson, 1957;
Schultes, 1941).

Don Alejandro, the informant, spoke only a Mazatecan dialect. One of his sons served as an interpreter, translating from the native tongue to Spanish. The information they provided the authors was gathered in fragments over many visits during the summer of 1979 and spring of 1980.

Mazatec healing and religion are united in a manner common to traditional cultures. This is somewhat foreign to Western scientific medicine which is isolated from religion except for the times when it no longer serves to cure. A brief description of Mazatec healing, based mainly on the work with Don Alejandro should help to explain the use of ska Maria Pastora and its relationship to other healing plants. The Mazatecs (the name, taken from the city of Mazatlan, was actually imposed on the natives by the Spanish) are nominally Catholic Christians, but they have incorporated many features of their traditional beliefs into their conceptions of God and the Saints, whom they consider to have been the first healers. The most prominent among them is San Pedro, or Saint Peter, who is said to have cured a sick and crying infant Jesus through the ritual use of tobacco (Nicotonia spp.). Tobacco is considered to be a health problem in the United States and many other countries, and its acute pharmacological effects are due to the alkaloid nicotine (Larson et al., 1961). Yet for the Mazatecs, as well as for almost all Mesoamerican Indians, it is the most important curing tool in the "pharmacopeia". The fresh tobacco leaf is ground, dried and mixed with lime to form a powder known to the Mazatecs as San Pedro (Saint Peter); the "best" is prepared on the Saint's day, June 29th (Inchaustegui, 1977). This preparation is more familiarly known by its Nahuatl name, picietl). It is worn-in charms and amulets as a protection against various "diseases" and witchcraft, but its most important use is in limpias, or ritual cleansings. It may be used alone with a prayer and copal (an incense prepared from the resin of Bursera spp.) (Diaz, 1975b), or in conjunction with herbs such as basil (Ocimum spp.) or marijuana (Cannabis sativa), eggs or various other substances. Anyone who comes to Don Alejandro to be treated usually gets a limpia This ritual cleansing may be the cure in itself, or it may be accompanied by other "medicines". The patient is given a pinch of the San Pedro powder (wrapped in paper) to carry with them and use during the healing period.

One learns to become a shaman through an informal apprenticeship, although the Mazatecs will insist they are taught by a progression of visions from and of heaven, rather than by people. Psychotropic plants are intimately associated with this training, which can last up to two years or longer. In this area of Oaxaca, as well as the highland region visited by Diaz, Don Alejandro does not use marijuana, as it is illegal. The vision inducers are taken systematically at intervals of a week to a month. Once one becomes a healer the hallucinogenic plants are ingested much less frequently. The process begins by taking successively increasing doses of S. divinorum for a number of times to become acquainted with the "way to Heaven". Next comes mastery of the morning glory (Rivea corymbosa (L.), Hallier, f.) seeds and finally one learns to use the sacred mushrooms. There is a very rigid diet.
to follow during this time, "Hot" foods such as garlic and chili peppers are restricted and there must be abstinence from sex and alcohol for extended periods. However, many Mazatec shamans incorporate alcohol into their training and drink during their ceremonies (Wasson and Wasson, 1957).

Breaking from this dieta, or ritual diet could "make one crazy," according to Don Alejandro and since such obligations require maturity, one should be at least 30 years old before becoming a curandero.

**A comparison of Mazatec hallucinogens**

Ska Maria Pastora is, pharmacologically the weakest of the three hallucinogenic plants. Following its ingestion the Virgin Mary is supposed to speak to the individual, but only in absolute quiet and darkness. The relatively mild experience is readily terminated by noise (such as a loud voice) or light. Don Alejandro says the effects of tu-tu-sho, the flower seeds (R. corymbosa), are similar to those of the Maria (S. divinorum) as both plants are siblings (son hermanos) under the protection of the Virgin Mary and San Pedro. A "dose" he provided weighed 9.6 g and consisted of about 350 R. corymbosa seeds. A brief report on another morning glory (Ipomoea purpurea) noted that the ingestion of a large number of seeds produced effects similar to LSD, but with an additional narcotic component characterized by drowsiness and torpor (Savage et al., 1972). Humphry Osmond also noted a narcotic effect on dosing himself with R. corymbosa seeds (Hoffer and Osmond, 1967). The activity of morning glories appears to be due to d-lysergic acid amide (ergine) and related alkaloids (Schultes and Hofmann, 1980).

Interestingly, the authors discovered a woodrose (Argyreia spp.) growing in the vicinity of the village where Don Alejandro lived. Argyreia spp. contain LSD-like compounds (Chao and DerMarderosian, 1973). When asked whether he used the plant, Don Alejandro said that he did not, since it caused people to become crazy. The curandero also had several horticultural specimens of Coleus spp. growing near his house. Wasson has reported that the Mazatecs believe Coleus to be a medicinal or hallucinogenic herb closely related to S. divinorum (Wasson, 1962). However, Don Alejandro said the plants were not medicinal and his daughter had bought them at the market because they were pretty.

According to Don Alejandro ni-to, or the mushrooms-that-one-takes (hongos para tomar, probably not a literal translation, see Wasson, 1980) are unlike the other two plants. The fungi are delicado (delicate), nervioso (nervous), una cosa de envidia (a thing of envy). Unfortunately the English translations of these terms do not convey the Indian-Spanish concept of magic that has a dangerous and sinister side. Santa Ana and San Venanzio, the Saints the curandero associates with the mushrooms, were not as good at healing as San Pedro and the Virgen Maria, the patrons of the Salvia and the morning glory. Eating too many of the fungi can "leave one crazy" and the visions are often trucos (tricky). Other Mazatec informants have attributed such characteristics to the visions, saying that one has to separate the true
from the false (Inchaustegui, 1977). Wasson has reported that misuse of the mushrooms can lead to madness (Wasson and Wasson, 1957). Munn and Wasson have given complementary descriptions of shamanic use of mushrooms among the Mazatecs (Munn, 1979; Wasson 1980). Psilocybin and psilocin, the vision-inducing compounds in the fungi, were isolated by Hofmann, who used himself as a subject to assay for their activity. He reported that a dose of 2.4 g of dried Psilocybe mexicana Helm (an average amount for a curandero) produced effects he could not control or resist. A colleague "was transformed" into an Aztec priest and at the height of the experience Hofmann felt that he "would be torn into this whirlpool of form and color and would dissolve" (Hofmann, 1980). This powerful experience was quite unlike the mild one produced by S. divinorum. As Don Alejandro stated it, "The Maria, on the other hand accepts you (la Maria, en cambio, te acepta)."

**Remedial uses of S. divinorum**

From the shaman the investigators learned that the plant could be used as a "medicine" as well as for the induction of visions. A low dose serves as what the investigators interpreted to be a "tonic" or "panacea" as well as for "magical" healing (Don Alejandro did not use such terms). An infusion prepared from 4 or 5 pairs of fresh or dry leaves may be taken by the glass (vase) or tablespoonful (cucharada) as needed. It is used to "cure" the following "illnesses", although there may be other possible uses:

1. It helps one defecate and urinate. It stops diarrhea (the plant apparently is believed to regulate eliminatory functions).

2. It is given to the sick, old or dying to revive them or alleviate their illness. People who are pale, white and almost ready to die (they have "anemia") may recuperate on taking la Maria.

3. It may be taken to relieve headache and rheumatism (however, when taken in the high doses that induce visions; it often leaves one with a headache the following morning, according to the curandero).

4. There is a semi-magical disease known panzon de barrego (sic), or a swollen belly, which is supposedly caused by a curse from a brujo, or evil sorcerer. The victim’s midsection swells up due to a "stone" that has been put inside them. Taking the Salvia causes elimination of this "stone" and the belly shrinks down to size. The researchers met an old shaman who showed them his wrinkled middle and said he had cured himself of the "disease" by use of la Maria. Don Alejandro confirmed the "illness" and the "cure".

**Divination with S. divinorum**

S. divinorum may be prepared as an infusion from 20 (about 50 g) to 80 (about 200 g) or more pairs of fresh leaves to induce visions, and may
be taken by the curandero, the patient (or apprentice) or both, depending on the situation. Only fresh foliage will serve for divination; At this dosage level, the Salvia is used to foretell the future, find the causes and cures of illnesses and obtain answers to questions about friends, enemies and relatives. In shamanic training, the future healer takes la Maria to learn the ways of healing and the identification and use of medicinal plants (there is supposedly a tree in Heaven with all such herbs on it and one talks to God and the Saints about them under the influence of the hallucinogens). After preliminary sessions in the company of the master, who takes the infusion along with the apprentice to watch over him on the journey, the future healer may continue study on his own until it is time for the next plant in the series. Don Alejandro told the investigators that the Salvia, the morning glory seeds and the mushrooms each told their own historic (story or history: and ska Maria was the best teacher of the ways of curing, as one learned the most from it. During the course of visits, the researchers were able to participate in two sessions under the shaman's guidance. As the hallucinogens are never taken without a valid purpose and since the visitors were from "the University", the ceremonies were oriented to teach them about healing and especially the uses of the Maria and other medicinal plants. Don Alejandro said they would have to follow the dieta, or ritual diet for 16 days, although they could bathe and drink beer (after the first time, the dieta for S. divinorum is only 4 days in length).

The preparations for the two ceremonies were essentially the same. As dark came (about 19:30 h to 20:00 h) the curandero began making the Salvia infusion. The leaves were first counted out in pairs to arrive at each person's dose and put neatly into piles with their petioles aligned. Then Don Alejandro picked lip part of a pile and crushed it by hand into a small enameled bowl partially-filled with water (Fig. 3). As more foliage was squeezed and added, the liquid turned dark green from the chlorophylls. After the potion was prepared, it was poured through a sieve into a glass which was topped off with water (Fig. 4). During the preparations for the second session a head of foam formed on the glasses and the curandero laughed. He explained through his son that the foam (espuma) was an indication of strength and the Maria would be very potent that evening. The glasses were covered with inverted cups to "prevent the escape of the humor (que no salga el humor)". Although the foliage of S. divinorum could reportedly be kept fresh for a week or longer when wrapped in the large leaves of Xanthosoma robustum Schoff, the prepared infusion was said to be stable for a day. The spent leaves were set aside to be discarded in an out of the way location where they wouldn't be defiled by people or animals. However, Don Alejandro said that they could still be used by putting them on a subject's head to refresh them after the session. The curandero picked up a glass of the Maria and began an oration. The Holy Trinity, Saint Peter, the Virgin Mary and other Saints were called on to watch over the participants and teach the visitors the ways of curing:

In nomine Spiritu Santo (this "Latin" phrase was always translated into the vernacular as:
In the name of the Father, the Son and the Holy Ghost

Most Holy Lord Saint Peter
In the name of Leandros (the subject),
In nomine Spiritu Santo
Maria, show Leandros,
that he may see what there is in the world
For he wishes to study all the classes of medicines
Lord Jesus Christ, show him
May he learn
May he see all the classes of medicinal plants
You, who know all, show him
I want you to show him all the different kinds
of illnesses and remedies that exist in the world
In a short time he must learn your story
In nomine spiritu Santo
Most Holy Sainted Rosary
Set him free, that he may see it
Show him as you have shown me
May he recognize all that is the Universe,
All that is you History
He wishes to learn out of love and sincerity
I want you to show him, as I am asking your favor
You, Maria and Lord Jesus Christ, amen
If there is bad or good, save him
Help him out of sincerity and love
In nomine Spiritu Santo

Most Holy Lord Saint Peter
You too, Maria, show him
Set him free that he may see it
Do not be deceptive
This day, on this very date
he is going to take it (the Salvia infusion)
In nomine Spiritu Santo
Most Holy Lord Saint Peter
Help this Leandros
May he grow more, may he learn things
Show him all that there is in the world
All that is good
All that is medicinal
In nomine spirit Santo

Most Holy Lord Saint Peter
Lord Saint Anthony, Lord Saint Peter, Jesus Christ
You are the only three who know about la Maria
You must show him all that is medicinal
All that is the Universe
All that is your History
Show him, do not be bad
In nomine Spiritu Santo
Holy Sanctuary, Lord Santa Ana
You who are good, You must help him
so that he becomes acquainted with our Universe
You must teach him what I ask
to that it will be to the Lord Saint Peter's pleasure
Let Leandros take it (la Maria)
In nomine Spiritu Santo
Most Holy Lord Saint Peter

Two to four hours passed in conversation and the telling of stories. The shaman repeatedly emphasized that it was important to describe one's visions, "If you are going to learn or if you are going to understand what it is all about, you must speak." Finally it was time for ingestion of the infusions (between 21:00 h and 23:00 h). Following Mazatec custom, at least one person didn't participate, in order to watch over the rest (Wasson et al., 1974). As a last protection against any dangers during the visionary "travels", Don Alejandro performed limpias, or ritual cleansings, on the visitors.

In nomine spirit Santo
Most Holy Lord Saint Peter
This is a limpia for Leandros (subject)
Arise, listen, as it is now the time
In nomine Spiritu Santo
Most Holy Lord Saint Peter
I ask Your favor for Leandros
Heal him, care for him
For I am going to cleanse him now
Help him at this moment that he may be cleansed
Strike out the bad illnesses that he may have
Lord (Saint Peter) attend him
That he may see the Universe
What there is in the world
Everything
Help him, raise him
May he see what there is
All that he wishes to know
Save him, care for him
San Pedro during the limpia, or ritual cleansing.
In nomine Spiritu Santo
Most Holy Lord Saint Peter
Reclaim this man
That he live well, live better
For this man is known by all the children of God
Heal him, as You will
Heed his messages the moment you heal him
Take care of him, help him
That is what I am saying
In nomine Spiritu Santo
Molt Holy Lord Saint Peter
Lord Jesus Christ
You know how to save him, how to cleanse him
Cure him, no matter what badness has fallen on him
Heal him, care for him
I want You to heal him and save him from all bad things
Being in my hands, I can help him,
having faith and will
In nomine Spiritu Santo
Most Holy Lord Saint Peter
Sainted Trinity, care for him
Help him, let no evil befall him

As the oration was being recited, Don Alejandro anointed the subject with a piece of copal dipped in the San Pedro. The curandero then gave him a pinch of the San Pedro to carry for protection if he felt danger during or after the session. After a final benediction, the potions were drunk and the light was turned out.

Session 1, August 18, 1979

The participants were Diaz, Valdes and Don Alejandro, whose son sat on a bench and watched over the others during the proceedings. The curandero and Diaz, who had taken la Maria several times previously, each had doses prepared from 50 pairs of leaves. Valdes received a beginner's dose made from 20 pairs. They took the Salvia preparations around 22:30 h. The visitors shared a large cot while the shaman lay on a petate, or sleeping mat which was unrolled on the floor.

Diaz sat quietly on the side of the cot after the lights went out. About 15 min after ingesting the infusion he began to see subtle visions, constricted like columns of smoke in the total darkness. It made no difference whether his eyes were opened or closed. Deciding to speak out, he saw a light which disappeared as he began to describe it. The images increased in intensity. He saw a mountain made of ice, as though he were at the base of a cliff formed from large ice columns. The vision slowly changed into Cerro Rabon, a nearby mountain intimately associated with Mazatec legends (Inchiustegui, 1977). About 23:00 h the flow of images changed into lights of various shades of blue, indigos and purples, scattered as if in a spatial vacuum. Depending on his perspective, he was either traveling through them or else they were being projected toward him. He saw a cross being encircled by a light and a mantle. As he described the imagery in words, it seemed to be fixed more clearly in his memory and he felt it would aid in later recall of the experience.
Some 45 min after the light went out, Don Alejandro began to speak in a monotone. His son did not interrupt to translate from the Mazatec. As the shaman spoke, Valdes (who had only experienced a few brief visions which he hadn't described) saw a black sky with brightly-colored objects floating in it. He suddenly found himself speeding toward one and actually felt he was accelerating through space past the rest. The light turned out to be a Mazatec village similar to that of the curandero. Valdes saw it from above, as if he were on a hill. Shapes, like kaleidoscopic pillars of smoke, were at the sides of some of the houses, Then he was suddenly back in space, receding away from the vision.

Don Alejandro stopped speaking, turned on the light and went to look for a "spy" he had heard outside the house. He found nothing, but forced himself to vomit, which he said would end his visions. The session had lasted about 1 h, and the following hour was spent in discussion of what had been seen. The curandero told the two visitors that he had watched over them during the session and ascertained what they needed to know. The old man said that after a few more experiences Diaz would learn to heal and use the medicinal plants. He mentioned a woman, a doctor like Diaz, who would try to interfere with or get involved in his work. Don Alejandro emphasized to Valdes, who had remained quiet throughout the night, that it was necessary to speak out about the visions and he would need many sessions before he would learn how to heal. Everyone then went to sleep and rose early the next morning.

**Session 2, March 6, 1980**

During this much less formal session Diaz and Valdes took the infusion of S. divinorum and were monitored by Don Alejandro and his son, as well as by Paul, who tape recorded events throughout the afternoon and evening. The researchers arrived at the village around 17:00 h and the shaman spent the entire afternoon and early evening talking with them about his visions of "Heaven" and the office (escritorio) he had there, near God and Jesus.

He recounted many tales and legends, including one about the origins of healing. It was a very enjoyable afternoon which provided an excellent set and setting (Weil, 1972) for the visitors’ experience with la Maria Diaz and Valdes received infusions prepared from 60 and 50 pairs of fresh S. divinorum leaves, respectively. They drank the prepared potions at 21:00 h and lay down in Don Alejandro’s bedroom while the curandero’s son and Paul sat on a bed next to them. Don Alejandro remained in the other room. The two researchers spoke in turn and were questioned by the younger Mazatecan whenever there was a lull in their speech:

Paul -- Nine o’clock, Leander and Jose Luis are drinking (the Salvia infusion). . .  

(indicates a pause in the recording)
Diaz -- Nueve doce (he looked at his lighted watch). Empiezo a sentir algunos de 106, de los efectos de la planta. Me siento muy relajado. Y he tenido en los ultimos minutos muchas imagenes de plantas y flores. Mucha, muchos tipos de flores diferentes... algunos de ellos desconocidos para mi... De muchos colores. Siento mi cuerpo muy suave, como ligero. En los ultimos momentos empezaba a ver algunas imagenes como de puntos de luz. (Nine-twelve. I am beginning to feel some of the effects of the plant. I feel very relaxed. And I have had, in the past minutes, many images of plants and flowers. Many, many different kinds of flowers... some of them unknown to me... Or many colors. My body feels very mellow, as if it were light. In the past moments I began to see some images like points of light.) That's all for now.

Valdes...plants and flowers. I think they were what people call eidetic images, because I saw them when I first closed my eyes. They've disappeared. I feel like I'm being twisted around inside of my body. Very, very strange sensations, like I'm being...twisted. Boy, like I'm spinning.

(Spanish deleted from here on - All translations are in parentheses)

Diaz - (Spanish deleted) translation- (Nine-twenty. The... the sensation of lightness of the body is more intense. In a given moment I felt as though... as though I were floating through a root and the images of plants have changed and now I have had sensations like floating in the night full of stars and I realize that it isn't... it isn't easy to have... that it isn't easy to have the, the faith that he... that he asks of us. That he asks of me. I feel very... very, like very moved. All these things. That's all for now.)

Son -- Jose Luis?

Diaz -- (yes?)

Son -- (Do you see any more images?)

Diaz -- (Yes, a little. I have seen more, but it has not been very intense, no? I have seen... as though I were floating in the sky, as though I had entered a large boat or something like that. And... and as if all the things inside were all very mechanical like a machine that was very... very precise and very geometric. And in... and curiously, as if in some cases there were again flowers inside the place. And again I began to see like many flowers, but as if they were all mechanical, as if they were not... real.)

Son -- (Christ? Didn't you see him?)

Diaz -- (Well... no. At times I thought about him, but he didn't appear as an image, no? At times I thought about some of the images which... which Don Alejandro described to us. Of the offices and... But, but nothing else.)
Son - (They didn’t show you everything.)

Valdes - ...down. It’s very very hard for me to talk. Like something’s pushing me down into the bed. My arms are very, very sore. (Dog barks) I see things but there’s no, no (lost to dog barking). They just overwhelm me. Very hard to describe. I see things that look like fruits. Very strange, I can see the seeds. I can see the (dog barks) oranges and yellows and colors. Strange. Like giant fruit.

Son -- (What is Leandros saying? What did he see?)

Diaz -- (dog barks throughout this section of the recording). (He says that it is hard... it is hard for him to talk. That his body teels very heavy.)

Son -- Mm-hmm.

Diaz -- (That the images are not... they are weak, no? They aren’t very’... they aren’t very intense, no? At times he succeeds... he succeeds in seeing some colors. He describes some flowers, and like fruit.)

Son -- (Yes.)

Diaz -- (But there aren’t. . . there aren’t images that are very.. . very.. .)

Valdes -- (There are many of seeds, no? Those of melons, no?)

Son -- Si.

Diaz -- (You feel... you feel very content, no?)

Valdes -- (Very heavy.)

Son -- (Didn’t you see anything else?)

Valdes -- (sic; sounded somewhat intoxicated at this time.) (Things, but I can’t describe them.)

Valdes -- . . (Cross With two arms) (. .it seems to be burning, no? That it bar two rays instead of one, no?)

Son -- Mm-hmm.

Valdes - (This thing seems to have fire.)

Son -- Mm-hmm.

Valdes -- (dog barked throughout). (That there is like a wrapped body.)
Son -- Mm-hmm.

Valdes -- . (dogs barked throughout). (of a cross. Now, (lost to dogs) now there were many things but now they are disappearing. Everything is like a very black.

Son -- Si.

Valdes -- (It looks like a picture, but everything in black and white.)

Son -- Mm-hmm.

Diaz -- (I saw, I saw something like the flower of the... the newer of the... of the seed of the Virgin. Buite clearly with its purplish color. I... Ipomea violacea, no? I see many, many images if... if I concentrate on them, no? They move a lot, no?)

Son -- Si.

Diaz -- (However the... the state of feeling content left me a while ago.)

Son -- Mm-hmm.

(the dog quieted down for a while)

Son -- (Can my Father explain now?)

Diaz -- (Yes. Look, I had... I think it is... it is also important that you tell him that... that he shouldn't feel bad because, because we... didn't... didn't see what he saw...)

Son -- Mm-hmm

Diaz -- (...exactly, because we come from... from a very different manner of... of looking at things, no?)

Son -- Mm-hmm.

Diaz -- (Then, because of this we have more difficulties in order to... in order to put ourselves in... in contact with Christ.)

Son -- Con Cristo. (With Christ.)

Diaz -- Y con lo Sagrado, no? (And with Sacred things. no?)

Son -- Mm-hmm.

Diaz -- (To us... to us other things happen, no? He shouldn't see this as a failure, no? Yours or even less, of the plant, no?)
Son -- Mm-hmm.

Diaz-- (Only it’s that our experience is very different because... well, we see things differently, no?)

Son -- Si.

Diaz -- (It is important for him that... for you both that you understand this, no?)

Son -- Mm-hmm.

Diaz -- (I feel very content, no? For... for the experience just as it is, no?)

Son -- Si.

Diaz -- (Well, that’s all.)

Son -- (You, Leandros, do you see more images? Or is that all you have seen?)

Valdes -- (I see images and they look a little but... like the images of the church but they don’t have faces, no?)

Son -- Mm-hmm.

Valdes -- (They have... one sees this, their clothing, no? Of, of gold and everything but there is no image. There aren’t any faces, no? That one recognized the...)

Son -- Mm-hmmm.

Valdes -- (lost; figures were praying). (They have their hands like this... like the...)

Son - (Is that all you saw?)

Valdes-- (I am looking at it now. I still... still am looking at it.)

Diaz -- (I continue to see, if I pay attention I continue seeing images.)

Son -- Mm-hmm.

Diaz -- (Like flowers again, very luminous, no? As if they had an interior light.)

Son -- Si.

Diaz -- (I think it has a lot to do with the... with the Heaven that... that you described to us a while ago, no? Of how Heaven is.)
Son -- Mm-hmm.

Diaz -- (Full of music. Full of flowers, no?)

Valdes -- (I see something between... between a cross and a sword which is all covered with gold, very... it has many jewels.)

Son -- Mm-hmm... (Do all the images continue, or is it still there?)

Valdes -- (Yes, yes, it... it continues, it continues. But it changes, no? It continues and it changes, no?)

Son -- Si.

Valdes -- (Now it is... now it is surely a sword. .. Now it has disappeared.)

Diaz -- (Now I raw like a light...like a light. These, these flowers that I said had like a . . . like very illuminated in the middle. Now it has changed into a light. . . strong, no?)

Son -- Mm-hmm.

Diaz -- (Which comes as though from above.)

Valdes -- (lost to truck noise)... (lost).... (It is...is a shape between a cross but it has everything inside. It has everything... lights and animals... of... of people, of plants. Everything...of many colors, like a picture. Very, very vivid colors. Of animals.)

Valdes --to collect this. : this image of a cross I could seem to be able to, when I really concentrate on it, pull it back out. It disappears and recedes into the things around it, and if I’d lose it in. .. in all the things that are happening. But if I work at it I can concentrate and bring it back (It’s that I can... I, I lose the image of the crews. But if I think about this thing, it comes back to me again, no?)

Son -- Si.

Valdes -- (It returns to me again and I can pay attention to it and concentrate on it. But it is fairly difficult. But that. . . one can. . . maintain this thing.) I think that’s something about this state that you learn to work around in. Pull images out as you need them.

Diaz -- . ..images of... like flying from a certain.. . (lost to noise). (Of... of flying as though at a certain altitude. And there are like fields planted with. . . and full of plants. Planted with all the plants that produce... produce grain that if used for food. Fields that are very, well cared for.)
Valdes --

"tilted on its side"? (dog starts again) (...which seems to be between a castle, or like a... a Byzantine church. I'm quite far from this thing. Not at its side, no? It isn't as it should be. It seems to be a little, how does one say, "tilted on its side"?

I, am very far away and as though I'm very high above this thing. Now it looks more like a castle. I see it from the... from very far away as though it is from there. As though it is below me. But I don't see anybody of people. There isn't anybody. There are banners. Of all colors.)

Diaz -- (That's interesting. When you mentioned a castle I also began to see one.)

Son -- Un castillo. (A castle.)

Valdes -- "just covered by robes"? (Still. .. I still see it. I see like shadows, shapes, but they don't have... I don't see faces on there things, no? They are like... how does one say, "covered by robes"? They make... and march but these things are very, very serious.)

Son -- ces todo lo que ues (Is that all you see?)

Valdes -- (I'm still looking at it, no? This thing is new to me. This thing.)

Fifty minutes had elapsed. The curandero's Son cut the session short, saying; that the village noises, especially the dogs, were too loud for worthwhile experiences. As Diaz and Valdes left the bedroom they staggered and stumbled. Although they said their minds felt clear, the tape recording showed their speech to be slurred and their sentence patterns to be awkward and broken. Diaz commented, "It is as though the body is intoxicated (borracho) and the mind isn't." Don Alejandro spent the next hour discussing their visions in detail with them, saying that with more experience what they saw would become clearer and more meaningful. He told the visitors that Paul should drive when they left, as the effects of la Maria would last the entire night.

As the car traveled through the late Oaxacan darkness, Valdes saw more. icon-like images. Among them was the Virgin of Guadalupe amidst red, white and green streaming banners. Whenever the vision began to fade, he found that he could recall it at will. Arriving at their destination, the three researchers ate a light meal. Diaz wrapped himself in a sarope (poncho), for he had a chill. He remarked that this had happened to him on previous occasions when he had taken the Salvia infusion. His heart rate, when measured by Paul, had slowed from its normal 60 beats per minute to about 40 however, he found himself standing in a bizarre, colored landscape talking subjects eyes and both had a normal pupillary response. Valdes felt "heavy"
and "sore", especially in the shoulders and upper arms. After a shower, all went to bed.

When the lights went out (about 23:30 h or 2.5 h after ingestion of la Maria), Valdes began to have more visions. He saw a purplish light that changed into a bee or mothlike shape which became a pulsating sea anemone. The imagery expanded into a desert landscape full of moving prickly pear (Opuntia spp.) shapes. During the first session the previous summer and throughout this evening Valdes felt the visions appeared to be like looking at a cross between a moving cartoon and a silent motion picture. Suddenly, however, he found himself standing in a bizarre, colored landscape talking to a man who was either shaking or holding on to his hand. Next to them was something that resembled the skeleton of a giant stick-model airplane made from rainbow colored inner tubing. The "reality" of what he was seeing amazed him. After a brief instant the desert scene reappeared and Valdes then slowly drifted off to sleep. The three researchers rose early the next morning and all were in good spirits.

Discussion and conclusions: ethnopharmacology of S. divinorum

Remedial uses

It is beyond the scope of this paper to comment on the efficacy of S. divinorum in treatment of the various "folk ailments". There is not enough information available to make a scientific decision. More fieldwork at this stage would be more practical and certainly much more useful than trying to screen for anti-inflammatory, cathartic, analgesic, diuretic, tonic and magical properties in the laboratory. However, it should be noted that many Salvia species are used medicinally throughout the world, and the genus name itself comes from the Latin salvare, to save. The middle English name for sage was save or saue. from the Latin Salvia via Old English saluie (Oxford English Dictionary, 1971), and Chaucer mentions it as a cure for wounds and broken limbs in "The Knightes Tale" (Chaucer, 1927). Common sage, S. officinalis, and Clary sage, S. sclarea, have had a long history of use in treatment of numerous maladies (Grieve, 1971). S. miltiorrhiza, or ton-shen, is one of the five astral remedies in Chinese medicine as is jen-shen, or ginseng (Panax spp.). This sage is credited with many tonic properties in the Pen Ts'ao, published in 1578 (Smith and Stuart, 1973), and is listed in "A Barefoot Doctor's Manual" (Anon., 1974). Siri Altschul has collected information on a number of medicinal Salvias from specimens at the Harvard herbaria (Altschul, 1973) and Diaz lists nine species as being used medicinally in Mexico (Diaz, 1976).

Use in divination

During the two sessions with S. divinorum, the investigators noted the
(1) Various sensations were reported by the subjects while lying or sitting down in quiet darkness. These included flying or floating and traveling through "space", twisting and spinning, heaviness or lightness of the body and "soreness".

(2) Physical effects also accompanied the experience. There was an intoxication that produced dizziness and a lack of coordination on trying to move about. The recording of the second session revealed slurred speech and awkward sentence patterns. Diaz had a decrease in heart rate accompanied by a chill. Both subjects had a normal pupillary response to a light shined into their eyes.

(3) Even though the subjects were aware of the sensations and the physical incoordination produced by the Salvia infusion, they claimed their minds seemed to be in a state of acute awareness. The experience was not like intoxication from alcoholic beverages.

(4) Previous reports of S. divinorum ingestion emphasized the mildness of its effects, and the shortness of their duration. It has been shown, however, that under the appropriate conditions of quiet and darkness it, was possible to experience effects which lasted for hours. The visions produced were readily terminated by noise or light.

(5) There is apparently an aspect of the Salvia intoxication that leaves the subject's mind in a receptive state. This was well documented in the second session when both subjects spoke out fairly continuously. Diaz began by describing plants and flowers. After he finished speaking Valdes began with a similar vision. When Diaz lamented his inability to see the religious figures as described by the curandero, he apparently triggered off Valdes, who saw such imagery for the rest of the session and during the ride in the car. As Valdes described a castle, Diaz began to see one also. Don Alejandro's son translated the shaman's explanation of how S.divinorum worked in humans. What happens to the i-nyi-ma-no (the soul, the heart or life, all three concepts are contained in a single Mazatec word) when one drinks the Maria is that the Maria has so much liquor (licor) that one is left as in a faint. For this reason a person becomes intoxicated (borracho) when they have been entered by the Maria, the oration my father prays and the words of Christ, also. But it really isn't liquor, I tell you, you go into a "delicate" state (delicado vayas). Do not worry, do not be afraid of what is happening to the i-nyi-ma-no; something does happen, but it is small and unimportant. At times one who takes the Maria becomes half-drunk but with the result that what they are taking will be engraved on their mind.

Among Mazatec healers who use the three divinatory plants (the mushrooms, the morning glory seeds and the Salvia), S. divinorum is the first to be employed in shamanic training. Leary and Alpert have been credited with being the first to discover the importance of what they called set ("a person's expectation of what a drug will do to him") and setting ("the environment,
both physical and social, in which a drug is taken") to an individual’s experiences under the influence of a hallucinogen (Wed, 1972). In traditional cultures, like that of the Mazatecs, the purpose of plants like ska Maria Pastora is to induce visions, and shamans, such as Don Alejandro, are master at the manipulation of set and setting to such ends. Although reportedly only weakly psychotropic, the Salvia infusion will induce powerful visions under the appropriate conditions. Two ritual orations, which heighten the mystery of what is to follow, are performed on the subject or apprentice, who then takes la Maria with the curandero himself. As the shaman reveals his vision in the silent darkness, the subject (whose mind has been put into a receptive state by the Maria and the ceremonial setting) is able to “see” it also. By having a sober person monitor the session any difficulties that arise will be observed, and if the experience becomes too terrifying, it can be readily terminated by a few words or producing a light. Mastering S. divinorum and learning to use the morning glory seeds before employing the mushrooms probably makes an apprenticeship much less traumatic than it would be by use of the fungi alone, in addition to giving the future shaman wider insights into the varieties of hallucinogenic experiences.

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