

SALVIA DIVINORUM and SALVINORIN A

(Street Names: Maria Pastora, Sage of the Seers, Diviner's Sage, Salvia, Sally-D, Magic Mint)

Introduction:

Salvia divinorum is a perennial herb in the mint family native to certain areas of the Sierra Mazateca region of Oaxaca, Mexico. The plant can grow to over three feet in height, has large green leaves, hollow square stems, and white flowers with purple calyces. The plant can also be grown successfully outside of this region. *Salvia divinorum* has been used by the Mazatec Indians for its ritual divination and healing. The active constituent of *Salvia divinorum* has been identified as salvinorin A. Currently, neither *Salvia divinorum* nor any of its constituents, including salvinorin A, are controlled under the Controlled Substances Act (CSA).

Licit Uses:

Salvia divinorum and its active constituent salvinorin A are not approved for medical use in the United States.

Chemistry:

Salvinorin A is a neoclerodane diterpene found primarily in the leaves and, to a lesser extent, in the stems of the plant.

Pharmacology:

Salvinorin A, also called Divinorin A, is believed to be the ingredient responsible for the hallucinogenic effects of *Salvia divinorum*. Although several other substances have been isolated from the plant, none have been shown to be psychoactive.

In the United States, plant material is typically either chewed or smoked for its psychoactive effects. When chewed, the leaf mass and juice are maintained within the cheek area with absorption occurring across the lining of the oral mucosa (buccal). Effects first appear within 5 to 10 minutes. Dried leaves, as well as extract-enhanced leaves purported to be enriched with salvinorin A, are also smoked. Smoking pure salvinorin A, at a dose of 200–500 micrograms, results in effects within 30 seconds and lasts about 30 minutes.

Several studies have reported the effects of using either plant material or salvinorin A. Psychic effects include perceptions of bright lights, vivid colors and shapes, as well as body movements and body or object distortions. Other effects include dysphoria, uncontrolled laughter, a sense of loss of body, overlapping realities, and hallucinations (seeing objects that are not present). Adverse physical effects may include incoordination, dizziness, and slurred speech.

Scientific studies show that salvinorin A is a potent and selective kappa opioid receptor agonist. Other drugs that act at the kappa opioid receptor also produce hallucinogenic effects and dysphoria similar to those produced by salvinorin A. Salvinorin A does not activate the serotonin 2A receptor, which mediates the effects of other schedule I hallucinogens.

Illicit Uses:

Salvinorin A and *Salvia divinorum* products are abused for their ability to evoke hallucinogenic effects, which, in general, are similar to those of other scheduled hallucinogenic substances.

Salvia divinorum is grown domestically and imported from Mexico and Central and South America. The internet is used for the promotion and distribution of *Salvia divinorum*. It is sold as seeds, plant cuttings, whole plants, fresh and dried leaves, extract-enhanced leaves of various strengths (e.g., 5X, 10X, 20X, 30X), and liquid extracts purported to contain salvinorin A. These products are also sold at local shops (e.g., head shops and tobacco shops).

User Population:

The 2023 National Survey on Drug Use and Health estimated that approximately 5 million (1.8%) people aged 12 or older have used *Salvia divinorum* in their lifetime.

The Monitoring the Future survey first measured *Salvia divinorum* in 2009, when 5.7% of 12th graders used salvia in the previous 12 months. In 2022, 0.8% of 8th, 10th, and 12th graders used salvia in the previous 12 months—a significant decrease in prevalence.

Illicit Distribution:

The Drug Enforcement Administration's National Forensic Laboratory Information System (NFLIS) Drug database collects scientifically verified data on drug items and cases submitted to and analyzed by participating federal, state, and local forensic drug laboratories. NFLIS-Drug received 107 reports of *Salvia divinorum* or salvinorin A in 2012, which declined to 31 in 2016, 12 in 2020, and 1 in 2023.

Control Status:

Salvia divinorum and salvinorin A are not controlled under the CSA.

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section; Fax 571-362-4250, Telephone 571-362-3249, or Email DPE@dea.gov.