

Dimethyltryptamine

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Dimethyltryptamine (DMT) is an indole alkaloid and a derivative of tryptamine (a metabolite of the essential amino acid tryptophan), which exists in many biological systems (endogenous substance) including plants and animals. DMT produces intense but short-lived (up to 30–60 min) psychedelic and hallucinogenic experiences. There is also increasing evidence that endogenous DMT plays a role in the central (CNS) and peripheral nervous system (PNS), and it may act as a neurotransmitter by acting as a non-selective serotonin agonist principally on the 5-hydroxytryptamine (5-HT_{1A} and 5-HT_{2A}) receptors.

dimethyltryptamine

psychedelic

psychiatric disorders

1. The Uses of DMT in Past and Modern Times

According to Eckernäs et al. (2022), DMT is a psychedelic that can potentially cure several psychiatric disorders, although little is known about its pharmacokinetics and pharmacodynamic properties ^[1]. Nevertheless, the lack of knowledge concerning DMT and its properties did not prevent people from the ancient past and modern times from experimenting with it at their discretion. Research data confirm that one of the more popular decoctions containing DMT is ayahuasca, consumed during so-called rites of passage in the Amazon since pre-Columbian times, whereby its use and sensations were monitored during these ceremonies by tribal chiefs who thought that these experiences were crucial in preparing young people for the roles assumed by adults ^[2].

The base for making this decoction is *Banisteriopsis caapi* (Spruce ex Griseb.) C.V.Morton, a plant that grows over vast South American terrains, and which can be found in the eastern part of Brazil, Ecuador, Bolivia, Peru, Colombia, and the Caribbean. It owes its Latin name to the missionary and botanist John Banister, who roamed the Amazon Forest in the 17th century. The psychoactive constituents to which the liana owes its appeal are the β -carboline alkaloids tetrahydroharmine, harmaline, and harmine. Taken in small doses, they exert an antidepressant effect. However, in larger doses, they induce a hallucinogenic experience. A hallucinogenic decoction is also produced when combined with DMT-containing plants, such as *Psychotria viridis* Ruiz & Pav. ^[3]. Ayahuasca accompanied indigenous people at nuptials, birthdays, and initiations in the Amazon region. At the same time, ayahuasca is used in natural (traditional or cultural) medicine for strengthening, aiding concentration and performance, and cleansing the body of accumulated toxins. Among indigenous Amazonian peoples, any circumstances during which it is permissible to use the plant for medicinal and ceremonial purposes are regulated by internal tribal arrangements ^[4]. Both the preparation and serving of the brew are only allowed to curanderos (local healers—shamans) ^[3].

Some researchers suggest that the DMT-containing secretion of the toad *Incilius alvarius* may also have been used in the southwestern U.S. and in northern Mexico. It has been established that a single toad can produce doses sufficient to achieve psychedelic sensations. Admittedly, the doses are toxic when ingested orally, but burning the collected secretions followed by inhalation produces potent psychedelic results [5].

In Western culture, it is possible to identify several important dates relating to the modern history of DMT. According to Steven Barker, such a date is 1931, when Canadian chemist Richard Manske conducted the first synthesis of DMT in a laboratory [6]. Barker also pointed out that the occurrence of DMT in plants was discovered in 1946 by microbiologist Oswaldo Gonçalves de Lima, while the psychedelic properties of DMT were described in 1956 by Hungarian chemist and psychiatrist Stephen Szár, who extracted DMT from the Mimosa plant and conducted an experiment on himself by taking the extract via intramuscular injection [6]. One can also find slightly different dates for these discoveries in the scientific literature. According to Anna Ermakova et al., the first synthesis of 5-MeO-DMT took place in 1936, while the first isolation of the psychedelic from the *Dictyoloma incanescens* DC. plant of the *Rutaceae* family took place in 1959, and in subsequent years, it was identified in some fungi, secretions of the glands of the desert toads, and in mammals [7]. Despite the slight discrepancies in time, it must be acknowledged that these events bridge the gap between the profane and the sacred and between modern science and the cultural–religious use of many DMT-containing plants [6].

The use of DMT for ritual purposes is also observed in modern times. Indigenous South Americans have been using plants containing 5-MeO-DMT for thousands of years [8], and they used snuff made from *Anadenanthera peregrina* (L.) Speg. beans [7]. In Brazil, until modern times, there are several religious communities for which ayahuasca decoction is a sacrament in public rituals. Congregations celebrating ayahuasca are also found in Germany, Australia, Canada, France, the Netherlands, Japan, Spain, and the United States [9][10]. In the 21st century, ayahuasca healing sessions conducted by globetrotting curanderos are increasingly common and available to almost anyone interested [3]. As for the use of DMT-containing secretions of *Incilius alvarius* toads, researchers could not find definite historical evidence of its indigenous use, and it could be a relatively recent phenomenon [7].

Today, researchers are exploring the medicinal properties of psychedelics and providing a better understanding of their mood-enhancing and potential therapeutic properties [11]. At least a few studies have been undertaken in the last decade. Ido Hartogsohn, examining a cult originating in Brazil that uses ayahuasca brew during rituals, describes the profound dependence of psychedelic effects on psychological, social, and cultural factors [11][12]. Deborah Gonzalez et al. (2021) tracked data collected from 200 patients with psychiatric disorders treated with ayahuasca decoction, all of whom experienced marked and sustained improvements in health, quality of life, and spirituality [13].

In the most extensive study reported to date, collected from nearly 7000 respondents consuming ayahuasca, valuable data demonstrated the vital role of combining the ceremonial context of decoction use, therapeutic motivations, and the additional support obtained with yoga and tai chi exercises (Tai chi ch'üan), also sometimes known as “shadowboxing”, to produce positive results in terms of improved well-being, mystical experiences, and

insight ^[14]. These and other studies suggest that psychedelic experiences correspond closely with the enhancement and transcendence of mood, spirituality, cognitive abilities, and quality of life.

2. Legal Aspects

We should note two normative approaches when considering the legal aspects. The first is regulated by state or international laws, which aim to protect against the widespread use of DMT-containing specifics and reduce possible adverse events resulting from uncontrolled use. The second aspect is ritual–cultural use, which is regulated by cultural precepts but in a less restrictive manner.

DMT is on Schedule One of the 1971 United Nations Convention on Psychotropic Substances, which means that the drug is subject to mild restrictions, its use has no therapeutic effect, and there is a high potential for dependence, abuse, and the possibility of severe adverse effects ^[15]. However, in 21st-century Brazilian syncretic religions, ayahuasca use has spread to almost every continent; in several countries, these groups have obtained some form of legal authorization for the ritual and religious use of ayahuasca ^[16]. Congregations celebrating ayahuasca exist in Germany, Australia, Canada, France, the Netherlands, Japan, Spain, and the United States ^{[9][10][17]}. In contrast, the United Nations indicates that DMT can be used strictly for medical research and scientific purposes, while international trade is under vigilant and systematic observation ^[18].

Synthetic DMT derivatives appeared with the escalation of the so-called “legal highs” on the drug market—especially on the deep web and the darknet—influencing the introduction of appropriate “legal” arrangements ^[19]. In Poland, in March 2009, as part of an amendment to the Act on Counteracting Drug Addiction of 29 July 2005, the plants from which ayahuasca decoction is prepared were placed on the list of narcotics, and their distribution and use were subject to legal sanctions ^[20]. The 5-MeO-DMT is a controlled substance in New Zealand, the U.K., Australia, and several other countries ^[7].

As for the ritual–cultural aspects, the situation is not subject to overly restrictive sanctions. For this reason, ceremonies during which DMT-containing hallucinogenic decoctions are consumed could be said to promote the undertaking of travel to these places to experience mystical and entheogenic states ^[3]. In recent decades, so-called ayahuasca tourism has become popular ^[10]. Reported reasons for tourists reaching for ayahuasca include curiosity, treatment of mental disorders, the need for self-discovery, spiritual development, interest in psychedelic medicine, the search for purpose in life, and the opportunity to contact God, spirits, and transcendental energy, as well as hedonistic goals ^{[21][22]}. Of course, it should be noted that the exact specifics that can serve to improve psycho–physical–social well-being, when used solely for recreational purposes, can at the same time pose a critical threat to users ^[23]. Thus, it should be noted that true shamans understand and respect the powers hidden in plants, and none use hallucinogenic plants for entertainment, as Westerners do ^[24].

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