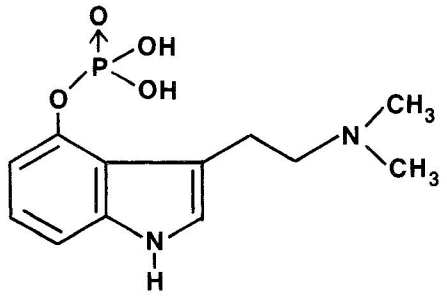
Profiles of Psychedelic Drugs



8. PSILOCYBIN

Description and Properties: Psilocybin, O-phosphoryl-4-hydroxy-N,N-dimethyl tryptamine, 3(2-dimethylamino)ethylindol-4-ol dihydrogen phosphate ester, is a white crystalline solid, soluble in dilute acids, poorly soluble in water and methanol and practically insoluble in other organic solvents. The pure alkaloid retains solvents tenaciously, melting over a several degree range in the 185-228° area. The free phenolic analog, psilocin, 4-hydroxy-N,N-dimethyl tryptamine, forms white crystals from methanol, m.p. 173-176° and is quite insoluble in water but dissolves in most organic solvents. It is unstable in solution.

History: The sacramental use of certain mushrooms, known as *teonanácatl* (Flesh of the Gods), has been well documented in Mexican Indian religious rites of some 2,000 years ago and may have been part of the Mayan culture of Guatemala a thousand years earlier. Early botanical studies suggested that these plants were simply peyote buttons (containing mescaline), but in the 1930s samples of *Panaeolus* and *Stropharia* species were obtained in Oaxaca and subsequently many species of the genus *Psilocybe* have been connected with certainty to Aztec history. In 1953, *Psilocybe mexicana* was identified and two years later psilocybin and psilocin were isolated from cultures and their structures verified by synthesis. The dried mushroom contains somewhat less than one percent of psilocybin, but this alkaloid satisfactorily duplicates the action of the natural fungus. Psilocybin-containing species of several genera are known to occur throughout the world, but it is only in the New World that there appears to have been historic record of their use.

Biochemistry and Pharmacology: Psilocybin and psilocin are stoichiometrically equivalent in potency and it is believed that the former is dephosphorylated *in vivo*. The drugs produce an augmentation of the patellar reflex in cats and an increase in the blood sugar level of rabbits. The action of oxidases to give the blueing reaction (a quinone-formation field test used in species identification of the intact mushroom) seems concentrated, in experimental animals, in heart tissue and to a lesser extent in the kidney. Psilocybin is an inhibitor of serotonin, the major indolic neurotransmitter of the central nervous system. The drug is an autonomic stimulant as well, leading to characteristic mydriasis, piloerection and hyperthermia. It is of unexpectedly low toxicity in test animals. The mono- and di-demethylation homologs (baeocystin and norbaeocystin) are known components of several *Psilocybe spp.*, but they are virtually unexplored pharmacologically.

Human Psychopharmacology: A typical human dosage of psilocybin is 10 mg of the alkaloid or from one to two g of the dried *Psilocybe spp.* fruiting bodies. The central effects become apparent in about 20 minutes and develop with a startling rapidity over the following 20 minutes. There is frequently time distortion (subjective slowing) during this period. The activity plateau rarely lasts much more than an hour and is characterized by alterations in spatial and temporal perception, often with distortions in awareness of body image. Positive expectations usually lead to pleasant experiences and, conversely, anxiety or uncertainty can allow a difficult intoxication. In the absence of visual and auditory input (as with nighttime isolation) the experience can be largely fantasy and rich with hypnagogic imagery. Gradual recovery requires an additional two to three hours and there is a good recall of the phenomena experienced.

Legal Status: Psilocybin is listed in the Federal Controlled Substances Act as a Schedule I drug with registry number 7437; psilocin has the registry number 7438.

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