

Hallucinogens on the Internet: A Vast New Source of Underground Drug Information

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Objective: The illicit use of hallucinogens is reemerging in the United States, especially among well-educated adults and teenagers. These same groups are also frequent users of the Internet. The authors sought to characterize the extent of information about hallucinogens available to Internet users.

Method: Using standard Internet search techniques, the authors located 81 hallucinogen-related sites and categorized the information provided.

Results: Internet sites offer thousands of pages of information—albeit of questionable accuracy—on how to obtain, synthesize, extract, identify, and ingest hallucinogens. Much of this information has yet to appear in textbooks. By contrast, the authors found few U.S. government agency sites offering cautionary material about hallucinogen use.

Conclusions: Using the Internet, potential hallucinogen users can bypass traditional channels of medical information and learn in great detail how to obtain and use numerous drugs with unknown hazards.

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The illicit use of hallucinogenic drugs is a reemerging public health problem, especially among well-educated adults and teenagers (1). These same groups are also avid users of the Internet, a potential source of underground information on hallucinogens. To assess the extent of this information, we examined hallucinogen-related sites on the Internet.

Method

Using Yahoo (<http://www.yahoo.com>), the most commonly used Internet search engine (2), on Dec. 10, 1998, we entered the word “hallucinogen” at the appropriate prompt to locate hallucinogen-related World Wide Web sites. We reviewed all “site” and “category matches.” We also followed links from these sites to pages offering further information on the synthesis, identification, procurement, or subjective effects of hallucinogens.

Results

In 300 minutes, we visited all 46 sites identified by the search engine, together with 35 additional sites visited by means of links (list available on request from Dr. Halpern). These sites collectively contained thousands of pages of information, and many had been heavily accessed by viewers. One site, "Lycaeum" (<http://www.lycaeum.org>), had counted 2,299,755 visits in the prior 37 months; another, "Hyperreal" (<http://www.hyperreal.org>), had counted 861,056 visits in 14 months. Many sites supplied state-of-the-art information, with details about botanical and synthetic hallucinogens that have yet to be described in current textbooks of addiction and psychiatry (3–8).

At least 14 sites explained how to identify wild plants containing hallucinogens, especially mushrooms such as *Psilocybe cubensis*. For example, the "North Florida Shroom Guide" (<http://www.jug-or-not.com/shroom>) posted photographs of *cubensis* strains growing wild in central Florida and even provided travel directions to choice foraging fields, with updates on the picking season. The site had recorded 91,437 visits in 35 months.

We also found abundant information on commercially available hallucinogenic plants, such as the San Pedro cactus (*Trichocereus pachanoi*), a common ornamental cactus sold in garden shops. "Erowid's Mescaline Vault" (<http://www.erowid.org>) accurately indicated that *Trichocereus pachanoi* contains about 0.12% mescaline (9). "Lycaeum" provided detailed information on how to identify *Trichocereus pachanoi* in a store and grow it at home. Although another mescaline-containing cactus, peyote (*Lophophora williamsii*), is a controlled Schedule I substance (10), *Trichocereus pachanoi* cacti apparently are legal to possess. Indeed, using Internet identification instructions, we found *Trichocereus peruvianus*, a cactus with an even higher mescaline content than *Trichocereus pachanoi* (11), for sale in a Boston hospital gift shop.

We found abundant Internet resources on refining or preparing hallucinogens for ingestion. For example, "Erowid" detailed how to extract mescaline from *Trichocereus pachanoi*. "Lycaeum" explained how to extract dimethyltryptamine and 5-methoxy-dimethyltryptamine from reed canary grass (*Phalaris* species), a grass found throughout the world, including North America. Wild strains of *Phalaris aquatica* and *Phalaris arundinacea* yield variable amounts of these potent hallucinogens (12, 13). A site about toads (<http://sunsite.unc.edu/martin/gonzostuf/toad.html>) detailed how to find the American *Bufo alvarius* toad to milk its poison, which contains 5-methoxy-dimethyltryptamine as well as bufotenine. Once dried, the toxin can be smoked for a powerful 15-minute high (14).

Turning from natural to synthetic hallucinogens, we located seven sites with chemical recipes for synthesizing essentially all of the hallucinogens listed in Schedule I, as well as numerous nonscheduled hallucinogen analogs. For example, "Hyperreal" listed 179 phenethylamine hal-

lucinogens, each accorded a linked Web page describing subjective effects, chemical structure, and instructions for synthesis.

We found eight sites selling strains of *Psilocybe cubensis* spores with a kit of tools and growth media to activate spores into developing mycelia and thereby into illegal psilocybin-containing mushrooms. One site, "Psilocybe Fanaticus" (<http://www.fanaticus.com>), even listed assays of mushrooms grown with and without tryptamine hydrochloride, correctly noting that tryptamine is a substrate of hallucinogens such as psilocybin and psilocin (15). We also found two Dutch sites offering to sell psilocybin-containing mushrooms directly to customers, although these companies did not guarantee shipments to individuals living in countries where possession of these mushrooms is illegal.

Seven additional sites offered to sell other hallucinogenic plant materials, although most did not explicitly identify them as hallucinogens. "JLF" (<http://www.jlfcatalog.com>) offered an extensive catalog of "poisonous non-consumables," including various beans, barks, leaves, and living plants containing dimethyltryptamine. "JLF" also offered purified 5-methoxy-dimethyltryptamine and the short-acting hallucinogen dipropyltryptamine (16). Similarly, "Ethnobotany" (<http://www.ethnobotany.com>) sold the leaves of *Salvia divinorum*, a plant containing the little-known hallucinogen salvinorin A, a neoclerodane diterpene structurally unrelated to all other hallucinogens (8) and traditionally consumed by the Mazatec Indians of Mexico (17).

Finally, an Internet travel industry offered tours to countries where hallucinogenic potions can be ingested within a traditional ritualized context. "Shamanismo" (now defunct) offered travel packages to locations in Colombia and Mexico in which the dimethyltryptamine-containing potion ayahuasca is prepared and offered to participants. "Shamanic Track" (<http://deoxy.org/shaman.htm>) also offered information on travel to the Amazon, again for the express purpose of experiencing ayahuasca.

We found 26 sites carrying other hallucinogen-related information, including a keyword-searchable database of hundreds of personal experiences with dozens of hallucinogens; a searchable database of street prices for hallucinogens and other illicit drugs in many American and international cities; and religious information about hallucinogens, including the sites of two legal Brazilian religions that actively use ayahuasca as a sacrament. We also found online books and bookstores; searchable databases of scientific articles on hallucinogen-related topics; materials on culture, social policy, and historical use; newspaper clippings; information on legalization or decriminalization efforts; and advocacy of ibogaine as a drug-addiction interrupter.

In contrast with the thousands of pages of underground hallucinogen information just described, we found only two linked sites from U.S. government agencies caution-

ing against the use of hallucinogens. These were the National Institute of Justice's 1997 report *Rise in Hallucinogen Use* (1) and the 6-page chapter "Hallucinogens" from a U.S. Drug Enforcement Administration book, *Drugs of Abuse* (<http://www.usdoj.gov/dea/pubs/abuse/chap5/contents.htm>). An additional two-page general warning, "Tips for Teens About Hallucinogens," from the National Clearinghouse for Alcohol and Drug Information was found independently of the 81 sites above by intentionally searching the federal government's health information search engine (<http://www.healthfinder.gov>). Although MEDLINE (<http://www.nlm.nih.gov/medlineplus>) did not appear in our search, this federally funded database provides online access to scientific articles about hallucinogens. But there are large gaps in this scientific information, since hallucinogens have only rarely been studied in the last 30 years in the United States (18).

Discussion

We used standard Internet search techniques to seek hallucinogen-related sites and then categorized the information provided. Replicating our study is limited by the constantly evolving nature of the Internet: no two searches will yield identical results over time. Moreover, different search engines use different methods for finding and presenting requested information. We believe that our point-in-time evaluation reviewed a representative collection of frequented sites by using the search engine currently employed more often than all others combined (2).

We found an extraordinary wealth of online information—albeit unchecked for accuracy—on how to obtain, synthesize, extract, identify, and ingest a vast range of hallucinogens. Many of these substances are so novel that they are hardly known elsewhere. Indeed, by compressing the time from discovery of information to its public dissemination, the Internet offers a flood of hallucinogen-related data that runs constantly ahead of that available to clinicians and legislative authorities. Since the U.S. government has devoted \$195 million toward an antidrug television and print media campaign during fiscal year 1999 alone (19), it seems prudent to extend this funding to provide comparatively inexpensive Web-based information.

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