ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 10, Issue, 05, pp. 35914-35918, May, 2020
https://doi.org/10.37118/ijdr.18774.05.2020

RESEARCH ARTICLE OPEN ACCESS

DESIGNER DRUGS: GLOBAL CHEMICAL WEAPON

***Varsha Chauhan**

Research Scholar, Amity Institute of Forensic Sciences, Amity University, Noida, Sector-125, Uttar Pradesh, India

ARTICLE INFO

Article History:
Received 13th February, 2020
Received in revised form
27th March, 2020
Accepted 20th April, 2020
Published online 30th May, 2020

Key Words:

Drug, Designer drugs, Cannabinoids, MDMA, LSD, Ketamine, Bath Salt, GHB, Etc.

****Corresponding author:*** **Varsha Chauhan,**

ABSTRACT

Drug – the word in itself sounds scary. We all have heard many horror stories surrounding this word. However, in reality, the drug is not something to be scared off. We all use it in our daily lives. It is not us humans, and even animals do; in the form of medicines. The scientific definition of 'drug' defined as "an article proposed for use in the finding, cure, alleviation, treatment, or hindrance of infection in people or creatures." The primary issue that comes with a drug is that once taken, it influences the body in both positive and negative manner. People nowadays are using all these medications for recreational purposes because they are not able to handle the pressure of life they are facing. Thus, anything discovers for a reason. Hence, these designerdrugs also discovered for a reason, and the goal is handling the legal circumstances and fulfillment of medications required by the people for recreational purposes. Thus, this study involves the general awareness and description of these designer drugs available all around the world, including India, the U.S., U.K., and other countries, as well as their street names through which they are to the local people.

Citation: ***Varsha Chauhan.*** "Designer drugs: Global chemical weapon*", International Journal of Development Research*, 10, (05), 35914-35918.

INTRODUCTION

Many definitions subsist for the term "drug." A drug defined as "an article proposed for use in the finding, cure, alleviation, treatment, or hindrance of infection in people or creatures" (1). Drugs influence biologic frameworks in both positive and negative ways.Humans have been assimilating cognizance of the effects of drugs for thousands of years (2). The first drugs were likely to be discovered through contingency and observation. As early humans endeavored different plant, animal, and mineral substances, they realized that some substances engendered concrete effects. They were then able to utilize the substances that had a salutary impacton achieving desired results, and they passed their cognizance of these "drugs" from generation to generation. Early veterinary pharmacology was approximately relied on rapid human pharmacology, (3) to the point where the same drugs may have been endeavored for human and animal illnesses (4). Yes, the practices of human and animal medicine share mundane commencements. A drug broadly defined as "any chemical agent that affects living processes" (5) that may be ingested through the mouth, the rectum, by injection, or by inhalation (6).

Imperatively, this standard definition is pharmacological: a substance characterized as a medication by its instrument of compound organization.Tow paramount conclusion follows:

First, according to the description, alcohol, caffeine, and nicotine are drugs, however, ingested and in whatever circumstances, for they are chemical agents within its terms (7). The reluctance of convivial convention to regard these agents as drugs requires explication and investigation. The popular definition of drugs indeed cannot be accepted uncritically without beseeching a most paramount moral question.

Second, the scientific definition implicatively insinuates nothing about the purposes of drug use, which include therapeutic remedy, assuagement of symptoms, pain, or apprehensiveness, regulation of mood (by the way either of depressants or stimulants), stimulations and exploration of religious experience, relinquish of hallucinatory fantasy for a range of purport, and recreational pleasure (8).

3Drug revelation is perpetually advancing as incipient fundamental erudition, methods, technologies, and strategies. Drug revelation is perpetually re-evaluating itself to improve

in haste, efficiency, and quality and thus remain prosperous (9).

Designer Dugs

Designer drugs are not developing phenomenon. Morphine, a paramount pain-assuaging medication engendered from opium in the 1800s, could be relegated as one of the pristine designer drugs. Be that as it may, in 1925, heroin and various other synthetically modified types of morphine ignored. In the 1960s and 1970s, a group of incipient synthetic hallucinogens propagated. These included LSD (lysergic acid diethylamide) and STP (serenity, tranquility, and tranquility, a.k.a. DOM, or 2, 5-Dimethoxy-4-methylamphetamine), a psychedelic superseded amphetamine. Manufacturing advanced considerably with the next wave of illicit pharmaceuticals introduced in California in 1979. Illicitly synthesized derivatives of the drug fentanyl (a puissant narcotic anesthetic) appeared under the designation China White, reportedly causing over 100 overdose deaths in the Coalesced States in a few months. In the mid-1980s, a chemically altered form of methamphetamine, kenned as Ecstasy (MDMA), gained widespread popularity (10). The term 'designer drugs,' coined in the 1980s, generally referred to sundry synthetic opioids predicated most on the fentanyl molecule and MDMA commonly kenned as Ecstasy. Fentanyl is a prodigiously potent analgesic, some 100 potent than morphine. MDMA and fentanyl mixes were the most famous manufactured medications at first.The terminology is discombobulating because, albeit the description' designer drugs' seems to mention the engendering of incipient drugs implicatively, many are not incipient. For example, cathinone derivatives have reported since the late 1920s. MDMA first synthesized in 1912, methcathinone in 1928, and Mephedrone in 1929. Cathinone is chemically homogeneous to ephedrine, cathine, methcathinone, and other amphetamines (11).

Indian data on designer drugs are very constrained. The first nationwide survey designated incipient emerging trend of substance use in India with amphetamine-like substances (ATS) are more utilized in certain regions like Goa and Ahmedabad. Most reports regarding these drugs emanate from newspaper articles, and no research data is available. A recent assessment by UNODC has found that the utilization of synthetic drugs (amphetamines and MDMA) has shifted to South-East Asia in past years. These drugs have caught the fancy of the young, affluent puerile generation of India. The rave parties at Goa commenced in mid-seventies kenned as Hippi culture. It was associated with loud music, dance, alcohol, and other substance abuse. Later on, the bars organizing such parties additionally trade Ecstasy or LSD. In recent years, Ecstasy had endeavored extensively in clubs at Goa, and there are withal structured or unstructured channels for ketamine, according to Goa police. One of the local widely available pills called a CK1 pill is now trending in clubs as party drugs at Goa. The medicine amalgamates cocaine and ketamine, sold by its street names Blizzard and Calvin Klein (12).

One of the most particular cases of this marvel is lysergic acid diethylamide (LSD), It evaluated that more than 250 000 dosages of LSD were conveyed for examination purposes by the Sandoz Pharmaceutical Company somewhere around 1955 and 1965. When adverse publicity over the recreational utilization of LSD prompted Sandoz to restrict the supply of LSD rigorously, the first clandestine LSD laboratories surfaced to meet the injunctive authorization. In 1967, not long after Parke-Davis pulled back phencyclidine as a pharmaceutical, the primary PCP research facilities showed up. Similarly, when the Comprehensive Drug Abuse Aversion and Control Act of 1970 put engendered quotas on amphetamines and barbiturates, clandestine amphetamine laboratories appeared (13).

Impact of drugs

Anyone can become addicted to a drug. They want to use a drug afore drug dependence, and addiction occurs both seductive and indiscriminate form in its users. Majority of the users do not even understand that medication use causes no less than three notable simultaneous changes in their bodies:

- The clustered and psychological substructure of the magnetization to a particular drug can elaborate as feeling rewarded or abated as good-time pressures seem to have become shelved, momentarily rectified, or neutralizes and defined a non-problematic.
- Pharmacologically, the nonmedical utilization of most drugs alters body chemistry mainly by interfering with its opportune (homeostatic) working. Drug increases retard, expedite, or deforms the reception and transmission of genuineness.
- The desire may satisfy an inborn or genetically programmed need or want.

Types of Designer Drugs

Synthetic Cannabinoids: Synthetic cannabinoids refer to a growing number of human-made mind-altering chemicals that are either splashed on dried, destroyed plant material so they can be smoked (homegrown incense) or sold as liquids to be vaporized and inhaled in e-cigarettes and other devices (liquid incense). These chemicals are called cannabinoids because they identified with chemicals found in the weed plant. Because of this similarity, manufactured cannabinoids are some of the time misleadingly called "engineered weed" (or "fake weed"). Indeed, they may influence the mind a great deal more capable than weed; their positive impacts can be eccentric and, now and again, severe or even life-undermining. Manufactured cannabinoids incorporated into a gathering of medications called "new psychoactive substances" (NPS). NPS are unregulated psychoactive (personality modifying) substances that have turned out to be recently accessible available and are planned to duplicate the impacts of illicit medications. Some of these substances may have been around for a considerable length of time yet have reemerged the business sector in adjusted compound structures or because of reestablished prominence. Makers offer these homegrown incense items in brilliant foil bundles and offer comparative fluid incense items, as other e-cigarette liquids, in plastic jugs. They showcase these items under a wide assortment of particular brand names; in past years, K2 and Spice were regular. Many other brand names now exist, for example, Joker, Black Mamba, Kush, and Kronic. For quite a long while, manufactured cannabinoid blends have been anything but difficult to purchase in medication stuff shops, curiosity stores, service stations, and through the Internet. Since the chemicals utilized as a part of them have a high potential for misuse and no health advantage, powers have made it unlawful to offer, purchase, or have some of these chemicals. Be that as

it may, producers attempt to evade these laws by changing the concoction equations in their blends. Easy access and the belief that synthetic cannabinoid products are "natural" and therefore harmless have likely contributed to their use among young people. Another reason for their use is that standard drug tests cannot easily detect many of the chemicals used in these products (14).

There are three types of cannabinoids:

Phytocannabinoids - are cannabinoids engendered by plants. The nine marijuana plant engenders over seventy phytocannabinoids. Δ -TetraHydroCannabinol or THC found at much higher concentrations than any other cannabinoid in the prevalent Cannabis Sativa plant, one of several plants that engender cannabinoids.

Endocannabinoids - are produced by the brain and other organs. The body induces seven or more endocannabinoids, two of which widely distributed and function in cannabinoid signaling: anandamide (2-arachidonoylethanolamide) and 2-AG (2-arachidonoylglycerol), which resemble, but are not identical to cannabinoids of plant inception.

What are the elements of endocannabinoids? Cannabinoid communication or signaling system has three major components:

(1) A chemical message or neurotransmitter (e.g., endocannabinoid),
(2) A receptor that interprets the message, and
(3) An enzyme that degrades the message

The system has antediluvian evolutionary inchoation, with components discovered in a range of vertebrates, and possibly some invertebrates. Endocannabinoids activate two types of proteins, the CB1 and CB2 cannabinoid receptors. These receptors have a myriad of functions in the body that influence functions of the brain, heart, testes, uterus, prostate gland, vascular tissue, immune cells, adrenal gland, and the intestinal tract. The CB1 receptor is the target of THC, the most active constituent of the marijuana plant, whereas the CB2 receptor, an impotent target of THC, functions primarily in peripheral tissues, and concretely in the immune system. With the revelation of these receptors and the host of endocannabinoid functions throughout the body, medicinal chemists engendered thousands of synthetic cannabinoids, seeking to discover cannabinoids that possess therapeutic, but not psychoactive properties or to probe the cannabinoid signaling system to demystify their role and how marijuana engenders profound psychoactive effects. With this massive array of synthetic cannabinoids and the precedent established by designer opioids, stimulants, and hallucinogens, it was prognostic able that some cannabinoids would be extracted from legal research/development documents and diverted to the clandestine emporium (15).

Synthetic cannabis marketed under different brand denominations. The flavor was the most punctual in a progression of engineered cannabis items sold in numerous European nations. Since then, several similar products have been developed, such as Kronic, Northern Lights, Mojo, Lightning Gold, Lightning Red, and Godfather. Synthetic cannabis withal marketed as aphrodisiac tea, herbal incense, and potpourri (16).

Synthetic Stimulants: Synthetic stimulants are bath salts often found in several retail products. These manufactured stimulants are chemicals. The chemicals are synthetic derivatives of cathinone, a CNS stimulant, which is an active chemical found naturally in the khat plant. Mephedrone and MDPV are two of the originator cathinones most usually found in these shower salt items. Many of these products sold over the cyber world, in accommodation stores, and in "head shops." On the street, bath salts are referred to as bliss, blue silk, cloud nine, drone, energy-1, ivory wave, lunar wave, meow meow, ocean burst, pristine ivory, purple swirl, red dove, snow leopard, stardust, vanilla firmament, white dove, white knight, and white lighting. Mephedrone is a beautiful white, off-white, or marginally yellow-colored powder. It can additionally found in tablet and capsule form. Bath salts conventionally ingested by sniffing or snorting. They can additionally be taken orally, smoked, or put into the solution and injected into veins. People who abuse these substances have reported the following: Agitation, Insomnia, Irritability, Dizziness, Melancholy, Paranoia, Delusions, Suicidal noetic conceptions, Seizures, and Panic attacks. Cathinone derivatives act as CNS stimulants causing rapid heart rate (which may lead to heart attacks and strokes), chest pains, nosebleeds, sweating, nausea, and regurgitating. Drugs have similar effects include amphetamines, cocaine, khat, LSD, and MDMA (17).

Synthetic Hallucinogens: Two thousand years ago, the archaic Athenians conducted secret nocturnal ceremonies in the temple at Eleusis to worship the goddesses Demeter and Persephone. Since initiates sworn to secrecy, little kenned of the rituals except that a drink called kykeon, a cumulating of barley with dihydrogen monoxide, mint, and ergot (from which LSD derived), was noted as the focus of this annual event. Homer, author of the epic poems the Iliad and the Odyssey, described the ceremony as "a blissful experience that could hoist men out of a gloomy tenebrosity." In various social orders, witch medicos or shamans have relied on "secretive" plants to cure infections and whitewash torment that did not respond to more standard solutions. Today, research conducted on the effects of MDMA (Ecstasy) in the treatment of post-traumatic stress disorder, and the active chemicals in psilocybin ("magic mushrooms") utilized in the treatment of cancer and other diseases. Whether synthesized (man-made in a laboratory) or found naturally in plants, a hallucinogen is literally "an engenderer of hallucinations." It is no surprise, consequently, that the word hallucinate from the Latin verb alucinari, betokening "to wander in mind or attention" or "to dream," since the user's mind wanders from image to image as a result of the steady stream of sensory effects from hallucinogens. In the 1950s, the expression "psychotomimetic" was regularly used to portray the impacts of drugs. In fact, from the 1940s to the 1980s, hallucinogens were widely prescribed and utilized in the field of psychiatry to treat a variety of noetic illnesses (18).

Most Popularly Known Designer Drugs

LSD (Lysergic Acid Diethylamide): LSD is a semi-synthetic drug not found in nature; it engendered in a laboratory. LSD derived from lysergic acid, a chemical found in ergot (Claviceps purpurea), and a natural fungus that grows on most rye, wheat, and homogeneous grasses. Lysergic acid on its own is not hallucinogenic; however, in fact, it utilized in several medicinal compounds (18).

Other Names: Acid, trips, tabs, microdots, dots, Lucy (19).

MDMA (Methylenedioxy- Methamphetamine, Ecstasy) : Ecstasy is a stimulant drug, which designates it expedites the messages traveling between the brain and body. However, many pills sold as Ecstasy only have a fraction of MDMA or none at all. MDMA makes it hard to ken what reactions to expect after taking Ecstasy or how lamentable the side effects will be. Low dosages connected with the more significant enactogen impacts of delicacy and openness. Higher doses move the utilizer into the more classic LSD-like hallucinogenic effects and increment MDMA's stimulating amphetamine effects as well. It is arduous to ken with assurance the exact dose of MDMA in each pill, incrementing the likelihood that a utilizer may unknowingly take a more immensely large dose than is either expected or can be handled (18).

Other Names: Eckies, E, XTC, pills, pingers, bikkies, flippers, molly (20).

Bath Salts: The drugs now kenned as Bath Salts were first synthesized (artificially engendered) in France in 1928 and 1929. Some pristinely researched for potential medical use, but most of the drugs engendered were unsuccessful due to severe side effects, including dependency. Abuse of these drugs commenced in the former Soviet Coalescence in the 1930s and 40s, where they utilized as antidepressants. Withal kenned as "Cat" and "Jeff," they gained popularity in the Coalesced States in the 1990s. Between 2004 and 2008, these drugs were utilized in Israel until the vital ingredient was made illicit. By 2007, they had gained broader popularity among drug abusers when they commenced to appear on Internet drug forums. "Happiness" pills broke down in the Netherlands in 2009 found that over a large portion of the pills did not contain the essential medication that Ecstasy connected with, yet rather sedates found in Bath Salts. In 2012, two of the critical drugs utilized in Bath Salts were made illicit in the U.S.11 However, underground chemists then engendered incipient variations with remotely different chemical formulas—and promoted them openly as Bath Salts, or repackaged them as "Glass Cleaner" or other names (21). Synthetic cathinones, more commonly kenned as "bath salts," are synthetic (human-made) drugs chemically cognate to cathinone, a stimulant found in the khat plant. Khat is a shrub grown in East Africa and southern Arabia, and people sometimes masticate its leaves for their mild stimulant effects. Synthetic variants of cathinone can be much more vigorous than the natural product and, in some cases, hazardous (22). Withal kenned as Bloom, Cloud Nine, Vanilla Welkin, White Lightning, and Scarface (23).

GHB: Gamma-hydroxybutyric acid (GHB), now a popular drug among recreational drug users, can lead to a rigorously depressed level of consciousness. The medication has examined for clinical handiness; however, much stays to be found out about its pharmacologic impacts. Most states have now made possession of GHB a malefactor offense (24). GHB (gamma hydroxybutyrate) is a depressant drug that decelerates the messages traveling between the brain and body. GBL (gamma-butyrolactone) and 1, 4-BD (1, 4-butanediol) are chemicals that are proximately cognate to GHB. Once GBL or 1, 4-BD enter the body, they convert to GHB virtually immediately. GHB conventionally comes as an achromic, inodorous, acidic, or salty liquid, which conventionally sold in little bottles or vials. It can additionally come as a luminous blue liquid kenned as 'blue nitro,' and less commonly as a crystal powder (25).

Amphetamines: Amphetamines are a group of drugs commonly kenned as haste. They incremented the activity of certain chemicals in the brain and classed them as stimulant drugs. Some examples of amphetamines include:

Dexamphetamine, which is utilized for medical purposes to treat conditions such as Attention Deficit Hyperactivity Disorder (ADHD) Methamphetamine, which is another form of amphetamine that is more potent than dexamphetamine. It can additionally be kenned as crystal, meth, or rock (26).

Other names: Haste, expeditious, up, uppers, louee, goey, whiz (27).

Ketamine: Phencyclidine, which is chemically akin to ketamine, was introduced into clinical practice in 1958. Albeit phencyclidine proved subsidiary as an anesthetic, it engendered astringent adverse psychological effects in the recuperation period. Ketamine, then designated C1581, is one of 200 phencyclidine derivatives, which investigated subsequently and proved to be the most promising. It was synthesized as Ketalar in 1962, first utilized on American soldiers during the Vietnam War, and relinquished for civilian use in 1970. It pristinely hoped that ketamine would be utilized as a sole agent for anesthesia, inducing analgesia, amnesia, loss of consciousness, and immobility. In any case, on account of its unfriendly mental impacts and the accessibility of other affectation operators, its use diminished rapidly. Recently, the availability of S-(+)-ketamine has regenerated interest in its clinical application, because it has more preponderant potency and fewer side effects (28).

Conclusion: To encapsulate, the details mentioned above and examples substantiate that designer drugs are the new chemical weapons that are causing harm to individuals throughout the world. In my opinion, I strongly feel that designer drugs are the new age weapon, and the weapon itself means the object or substance used for inflicting bodily harm. Thus, all the designer drugs from synthetic morphine to ketamine as well as N-bomb. All individuals are using these drugs for recreational purposes. All the recreational purposes are harming directly or indirectly to every individual all around the world. Thus, awareness in regards to designer drugs is significant in today's world.

REFERENCES

Adcock, D. (1993). The Save-Your-Life Glossary of Alcohol, AIDS, Drug, & Tobacco Terms. North Billerica, MA, ISBN-1-55915-495-0, (1-53).

Amphetamine drug profile. European Monitoring Centre for Drugs and Drug Addiction. Retrieved on May 21, 2016, from http://www.emcdda.europa.eu/publications/drug-profiles/amphetamine.

Amphetamines (May 2016). In the Australian Drug Foundation: Drug Info. Retrieved June 15, 2016, fromhttp://www.druginfo.adf.org.au/images/amphetamines-3may16.pdf.

Amphetamines: The facts. Drug Aware. Retrieved June 15, 2016, from http://www.dao.health.wa.gov.au/DesktopModules/Bring2mind/DMX/Download.aspx?Com

mand=Core_Download&EntryId=473&PortalId=0&TabId=211.

Amphetamines: The facts. Drug Aware. Retrieved June 15, 2016, from http://www.dao.health.wa.gov.au/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=473&PortalId=0&TabId=211.

Bath salts. Foundation for a drug-free world. Retrieved on June 22, 2016, from http://www.drugfreeworld.org/drugfacts/synthetic/what-are-bath-salts.html.

Bath salts. The science behind drug abuse. Retrieved on June 22, 2016, from https://teens.drugabuse.gov/drug-facts/bath-salts.

Bender, G.A. (1966). Great Moments in Pharmacy. Detroit: Northwood Institute Press.

Bough, M. &Trammel, H.L. (May 2006). The History of Drugs. Veterinary Technician, ASPCA Knowledge Management Department Urbana, Illinois.

Castellanos, D. &Gralnik, L.M. (2016). Synthetic Cannabinoids 2015: An Update for pediatricians in clinical practice. World Journal of Clinical Pediatrics, 5(1): 16–24.

Davis, L.E. & McDonald, L.E. (1982).Veterinary Pharmacology and Therapeutics (5 Ed., pp.1-7). Ames, Iowa State University Press.

DeCaprio, A.P., Hearn, W.L. &Swortwood, M.J. (2013). COMPREHENSIVE FORENSIC TOXICOLOGICAL ANALYSIS OF DESIGNER DRUGS. Doc. No. 244233, 1-53.

Di, L. & H Kerns, E. (2016). Drug-like Properties: Concepts, Structure Design, and Methods: from ADME to Toxicity Optimization (2 Ed., pp. 6). London: ELSEVIER.

GBH (May 2016). In the Australian Drug Foundation: Drug Info. Retrieved June 17, 2016, from http://www.druginfo.adf.org.au/images/GHB-25may16.pdf

German, C.L., Fleckenstein, A.E. & Hanson, G.R. (February 27, 2014). Bath salts and synthetic cathinones: An emerging designer drug phenomenon. Life Sci. 97(1): 2–8. DOI:10.1016/j.lfs.2013.07.023.

Grinspoon, L. (1971). Marijuana Reconsidered (pp. 202-06). Harvard university press.

H Kerns, E. (2016). Drug-like Properties: Concepts, Structure Design, and Methods: from ADME to Toxicity Optimization (2 Ed., pp. 5). London: ELSEVIER.

Hanson, G.R., Venturelli, P.J. & Fleckenstein, A.E. (2015). Drugs and Society (12 Ed., pp. 3). Burlington: JONES & BARTLETT LEARNING.

Hanson, G.R., Venturelli, P.J. & Fleckenstein, A.E. (2015). Drugs and Society (12 Ed., pp. 308). Burlington: JONES & BARTLETT LEARNING.

Ketamine (October 29, 2014). In the Australian Drug Foundation: Drug Info. Retrieved June 17, 2016, from http://www.druginfo.adf.org.au/attachments/article/46/Ketamine_facts_291014.pdf.

Marusich, J.A., Antonazzo, K.R., Wiley, J.L., Blough, B.E., Partilla, J.S. & Baumann, M.H. (December 2014).Pharmacology of novel synthetic stimulants structurally related to the "bath salts" constituent 3, 4-methylenedioxypyrovalerone (MDPV). Neuropharmacology, 87, 206-213.

Newton, E.D. (2007). THE NEW CHEMISTRY: The Chemistry of Drugs (pp. 80-85). New York: NY, InfoBase publishing.

Pai, A &Heining, (2007).Ketamine.Continuing Education in Anaesthesia, Critical Care & Pain j, Volume 7; Number 2.

Rajan, R., Gnanavel, S. &Sagar, R. (2015). Designer drugs: An overview and challenges in the Indian drug abuse scenario. DELHI PSYCHIATRY JOURNAL, 18 (1), 177-183.

Synthetic Cathinones ("Bath Salts") (January 2016). In National Institute on Drug Abuse. Retrieved June 12, 2016, fromhttps://www.drugabuse.gov/sites/default/files/syntheticcathinones_df_rev_1_2016.pdf.

Synthetic Cathinones (Bath Salts): An Emerging Domestic Threat (July 2011). U.S. Department of Justice National Drug Intelligence Center. Retrieved June 12, 2016, from https://www.justice.gov/archive/ndic/pubs44/44571/44571p.pdf.

Upson, D.W. (1993. General principles, in Handbook of Clinical Veterinary Pharmacology (4 Ed., pp. 1-174). Manhattan: KS, Dan Upson Enterprises.

Valter, K. &Arrizabalaga, P. (1998). Designer drugs directory. Switzerland: Lausanne, Elsevier Sciences.

****